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A Community-based Social Marketing Approach for Increased Participation in WEEE Recycling (ColectWEEE)

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Government of Ireland

ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency (EPA) is responsible for protecting and improving the environment as a valuable asset for the people of Ireland. We are committed to protecting people and the environment from the harmful effects of radiation and pollution.

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- the contained use and controlled release of Genetically Modified Organisms *(GMOs)*;
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- Office of Environmental Enforcement
- Office of Evidence and Assessment
- Office of Radiation Protection and Environmental Monitoring
- Office of Communications and Corporate Services

The EPA is assisted by an Advisory Committee of twelve members who meet regularly to discuss issues of concern and provide advice to the Board.

EPA RESEARCH PROGRAMME 2014–2020

A Community-based Social Marketing Approach for Increased Participation in WEEE Recycling (ColectWEEE)

(2016-RE-DS-7)

EPA Research Report

Prepared for the Environmental Protection Agency

by

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Executive Summary

Ireland is currently meeting the targets set by Waste Electrical and Electronic Equipment (WEEE) Directives (2002/95/EC and 2012/19/EU). However, high collection rates occur predominantly in the categories of large household appliances and fridges/freezers. Collection rates for smaller WEEE are less successful by comparison. Worryingly, people tend to hoard obsolete and broken small WEEE at home. Given these issues, there is a need to examine behaviours in relation to small WEEE.

What is evident from the literature is the importance of a holistic, situated approach. First, research into attitudes and behaviours concludes that pro-environmental attitudes do not necessarily translate into positive behaviours (the famous attitude–behaviour gap). This is evident in the existence of persistent irresponsible small WEEE disposal practices, including disposal of small WEEE via the general household waste. Second, institutional and structural factors affect individual behaviour. This is evident in the apparent difficulty so far in establishing consistent demographic characteristics across different studies. This raises the issue of context. Consumers' everyday disposition behaviours are dependent on the socio-technical and socio-cultural contexts in which these behaviours occur.

This study explored human behaviour in relation to small WEEE recycling. In doing so, the research took a quasi-ethnographic approach to investigate WEEE disposal behaviours from an "emic" perspective, i.e., consumer experiences and interpretations of WEEE and its disposal as these are situated within the context of consumers' everyday lives. The rationale for this approach is the need to reconcile the policy perspective on WEEE (etic) with the subjective experiences and interpretations that drive people's behaviours (emic). Fieldwork took place from September to December 2017 in the Munster region in Ireland. Data collection consisted of 26 in-depth interviews with 30 participants; observations and casual conversations at a civic amenity site and waste collection event; and participant observation at 25 retailers.

The findings reveal that, for consumers, electronic and electrical devices exist in fluid, in-between states of meaning and perceived value, from the time that they enter one's life until their disposition. WEEE disposal typically undergoes a four-stage journey, a process that electrical and electronic equipment (EEE) typically goes through before divestment: (1) once EEE is no longer used it tends to be either consciously stored or abandoned in the home; (2) a trigger prompts consumers to divest (critical moment); (3) provoked to action, consumers must decide what precisely to discard (transition from EEE to WEEE); and (4) consumers decide to recycle or not (divestment).

The introduction of a multi-pronged approach is proposed. First, short-term recommendations involve simple interventions to immediately augment the visibility and accessibility of WEEE recycling. These involve augmentation of the WEEE recycling brand, increasing consumer reflexivity through targeted information and routinising WEEE recycling through frequently visited collection points. Second, medium-term recommendations address issues of communication and trust building. Finally, long-term recommendations address the ideological underpinnings of WEEE recycling and the opportunities afforded by market-facing movements and collaborative consumption trends.

1 Introduction

1.1 Study Context and Purpose

In December 2015, the European Commission proposed a new policy through a document entitled Towards a Circular Economy: A Zero Waste Programme for Europe (EC, 2014). The circular economy (cradle-to-cradle) offers an alternative to the traditional linear model ("take, make, dispose") (Ghisellini *et al*., 2016). It is the "most recent attempt to conceptualise the integration of economic activity and environmental wellbeing in a sustainable way" (Murray *et al*., p. 369). The circular economy (CE) is restorative by design, it promotes renewable energy sources, rejects toxic chemical use and eliminates waste through improved design of materials, products, systems and business models (Ellen MacArthur Foundation, 2013; Hobson, 2016). CE systems are designed to reuse resources – thus recycling is central to the CE concept (Murray *et al*., 2017). The European Union's (EU) recent policy shift toward the CE is evident in the evolution of the Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC and 2012/19/EU) and demonstrates the EU's commitment to the prudent and rational use of natural resources.

The shift to CE requires both technological and social adjustments. In the context of WEEE, an important and arguably challenging dimension of CE is human behaviour and, in particular, effecting change in human behaviour towards more sustainable practices. New technologies and systems are essential in facilitating the proper reuse and recycling of WEEE. However, for the systems to succeed behavioural change is also required so that people engage with the available facilities. The purpose of this study was to explore human behaviour in relation to WEEE recycling. In doing so, the study took a quasi-ethnographic approach in order to investigate WEEE disposal behaviours from an "emic" perspective, i.e., consumer experiences and interpretations of WEEE and its disposal as these are situated within the context of consumers' everyday lives. The rationale for this approach is the need to reconcile the policy perspective on WEEE (etic) with the subjective experiences and interpretations that drive people's behaviours (emic).

1.2 Waste Electrical and Electronic Equipment (WEEE) Directives

The electronics industry has revolutionised everyday life in the Western world – rapid technological advancement underpins a thriving electrical and electronic equipment (EEE) industry and, consequently, electrical waste or WEEE burgeons. WEEE is thus a growing global environmental problem (O'Connell and Fitzpatrick, 2008; Ongondo *et al*., 2011). It is estimated that 41.8 million tonnes of WEEE were generated in 2014 (Baldé *et al.*, 2015). The amount of global WEEE is increasing as a result of technological advances and affordable appliances (Ongondo *et al*., 2011). In Europe, it is the fastest growing waste stream, growing at 3–5% per year (Eurostat, 2018). It is expected that WEEE generation in Europe will exceed 12 million tonnes by 2020 (EC, 2018). If treated incorrectly, WEEE is extremely hazardous and can cause major health and environmental problems and this is often a major concern for developing countries, which are often destinations for this form of waste (O'Connell and Fitzpatrick, 2008; Williams *et al.*, 2008; Robinson, 2009). Characterised by hazardous components such as chlorinated biphenyls and brominated flame retardants, if treated improperly, WEEE is highly toxic to humans and the environment. Additionally, WEEE is a rich source of secondary materials, many of which were identified as critical raw materials by the European Commission (EC, 2010; Martinho *et al*., 2017). Given these qualities the efficient management of WEEE is central to the emergence of a CE. However, WEEE quantification and preparation is a complex endeavour and includes the following challenges:

- The term EEE includes a broad range of rapidly evolving products with various components of various sizes/shapes/weights and with differing purposes. Subsequently, the environmental impact of EEE products at the end of life differs from product to product.

- EEE products are regularly replaced as updated versions become available.
- EEE composites include hazardous materials (mercury) and precious metals (gold, silver, ruthenium, indium, platinum), which must be treated accordingly.
- The broad range of actors involved in the collection, recovery and treatment of WEEE (Magalini *et al.*, 2014).

In light of these complexities, the EU drafted a directive to specifically address WEEE. In 2002 the first European Parliament and Council Directive on WEEE was transposed into Irish law via three statutory instruments – the Waste Management (EEE) Regulations (S.I. No. 290 of 2005), Waste Management (WEEE) Regulations (S.I. No. 340 of 2005) and Waste Management (Restriction of Certain Hazardous Substances in Electrical and Electronic Equipment) Regulations (S.I. No. 341 of 2005). Together with the Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC and the Energy Using Products (EuP) Directive 2005/32/EC, the WEEE Directive (2002) was designed to "address ever-increasing volumes of EEE waste generated, to improve recovery and recycling rates and processes; and to minimize the quantities of hazardous substances used in electrical components" through a suite of harmonised operational principles (Cahill *et al*., 2011, p. 456). Specifically, the WEEE Directive's (2002) stated purpose is the prevention of WEEE and the promotion of reuse, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste. Directive 2002/95/EC also seeks to better "the environmental performance of all operators involved in the life cycle of electrical and electronic equipment" (Article 1 of Directive 2002/95/EC) through the assignation of responsibility for the environmentally sound management of end-of-life products to producers, a principle termed "extended producer responsibility" (EPR) or the "polluter pays" principle. Article 3 of Directive 2002/96/EC defines a producer as any person who "irrespective of the selling technique used, including by means of distance communication . . . (i) manufactures and sells electrical and electronic equipment under his own brand, (ii) resells under his own brand equipment produced by other suppliers, (iii) imports or exports electrical and electronic equipment on a professional basis into a Member State".

Extended producer responsibility was introduced in the early 1990s to relieve municipalities of the financial burden of waste management and to incentivise the use of secondary materials, the reduced use of virgin resources and the production of eco-efficient products. The WEEE Directive (2002) promoted recycling and the reuse and recovery of WEEE and minimised the environmental risks and impacts associated with waste treatment (Johnson and Fitzpatrick, 2014). Once the directive was transposed into Irish law, end-of-life EEE could be deposited at retailers, gratis, on the purchase of a replacement product in "the same quantity, of an equivalent type and fulfilling the same functions, as that purchased by the consumer" (Ecologic Institute/ Institute for European Environmental Policy, 2009, p. 23). Additionally, producers and importers are obliged to finance the collection, treatment and management of WEEE from both households and businesses. Consumers can also deposit WEEE at local authority civic amenity (CA) sites free of charge. CA sites are purpose-built facilities where the public can bring materials for recycling free of charge; they are either run by or on behalf of local authorities.

In the WEEE Directive (Directive 2002/96/EC) WEEE is defined as "electrical or electronic equipment which is waste . . . including all components, subassemblies and consumables which are part of the product at the time of discarding" (Table 1.1). Historic WEEE refers to products that were put on the market before 13 August 2005 (Johnson and Fitzpatrick, 2014). Historic WEEE has proven difficult to quantify because of a lack of available information. It is estimated that historic WEEE accounts for 50% of all materials in the formal WEEE take-back channels in Ireland (Johnson and Fitzpatrick, 2014).

Directive 2002/96/EC established an initial collection rate of 4 kg of WEEE on average per inhabitant per year before December 2006. Under the guidance of the European Commission, and having considered technical and economic experience, the European Parliament and Council undertook to generate new collection targets before 31 December 2008. States were obliged to reach new recovery targets for each category, established in Article 7 of the WEEE Directive (Table 1.2).

The 2002 WEEE Directive was repealed in 2012 when the (recast) WEEE Directive 2012/19/EU of the

Table 1.1. Categories of EEE that fall under Directive 2002/96/EC

Category	Examples of typical EEE in this category
1. Large household appliances	Refrigerators, electric stoves, air conditioner appliances
2. Small household appliances	Vacuum cleaners, fryers, scales
3. Information technology and telecommunications equipment	Mobile phones, personal computers, telex
4. Consumer equipment	Radio sets, hi-fi recorders, musical instruments
5. Lighting equipment	Compact/straight fluorescent lamps, low-pressure sodium lamps, non-household luminaires
6. Electrical and electronic tools	Saws, sewing machines, tools for welding, soldering or similar use
7. Toys, leisure and sports equipment	Video games, electric trains or car racing sets, computers for biking, diving, running, rowing, etc.
8. Medical devices	Dialysis, fertilisation tests, cardiology
9. Monitoring and control instruments	Thermostats, smoke detector, heating regulators
10. Automatic dispensers	All appliances that automatically deliver different kinds of products (e.g. hot drinks/cold cans)

Table 1.2. Recovery and recycling targets as per WEEE Directive 2002/96/EC

Category	Rate of recovery (%)	Rate of reuse/ recycling (%)
1 and 10	80	75
3 and 4	75	65
2, 5, 6, 7 and 9	70	50

European Parliament and Council on WEEE came into effect. The new Directive 2012/19/EU was transposed into Irish law via the EU (WEEE) Regulations 2014 (S.I. No. 149 of 2014). The WEEE Directive 2012/19/EU has similar objectives and a similar scope to that of its precursor. However, it also seeks "to contribute to the efficient use of resources and the retrieval of valuable secondary raw materials" (preamble, Directive 2012/19/EU) – this reflects a shift in EU policy towards a CE.

Designed to address issues that had arisen or become evident in the years after introduction of the original directives, the new directive streamlined definitions, established new targets, redefined WEEE categories and strengthened provisions around WEEE shipments, reporting requirements and the development of standardised calculation methodologies (BIO Intelligence Service, 2013; Johnson and Fitzpatrick, 2014; Magalini *et al.*, 2014).

The new WEEE Directive 2012/19/EU classifies EEE according to six categorisations or descriptions contained in Annex III; an "open scope" approach is applied to eliminate a grey area that allowed Member States to determine whether some products were categorised as WEEE (EC, 2017). The new categorisation (Box 1.1) broadens the scope of the Directive to include almost all WEEE, with some clearly stated exceptions, thereby harmonising European laws around WEEE definitions.

The most substantive and heavily debated changes concern the redefinition of the collection targets. The original WEEE Directive 2002/64/EC was drafted in the 1990s; during the interim electronics have grown ever more central to everyday life. A diverse product category, EEE evolves quickly and is rapidly rendered obsolete. Consequently, WEEE continues to increase and is projected to grow at 3–5% per annum in Europe (Huisman, 2010; BIO Intelligence Service, 2013; Johnson and Fitzpatrick, 2014). The revised targets, now based on the percentage of the EEE placed on the market (POM) as opposed to a universal flat

Box 1.1. Categories of EEE that fall under Directive 2012/19/EU

1. Temperature exchange equipment
2. Screens, monitors and equipment containing screens having a surface area greater than 100 cm^2
3. Lamps
4. Large equipment (any external dimension more than 50 cm)
5. Small equipment (no external dimension more than 50 cm)
6. Small information technology and telecommunications equipment

rate, both reflect this growth and accommodate the economic differences between Member States. The new minimum collection rate is 45%, calculated as a percentage of the average weight of EEE POM across the preceding 3 years. From 2019 onward Member States must collect 65% of the average weight of EEE POM across the preceding 3 years or 85% of WEEE generated in that Member State. Recovery and recycling targets have also been revised. Throughout the transitional period (during which the original Directive's categorisation will still be applied) the earlier compulsory collection rates have been increased by 5% until 14 August 2018. As of 15 August 2018, the new, broader EEE categorisation will take effect (see Box 1.1); at the same time a set of applicable targets will be introduced (Table 1.3).

Finally, the new Directive extends the free take-back scheme to include very small household appliances (with an external dimension of less than 25 cm) when the retail outlet in question has a sales area of at least 400 m^2, regardless of whether the consumer purchases a new equivalent.

1.3 The Irish Context

In Ireland, the EU (WEEE) Regulations 2014 (S.I. No. 149 of 2014) replaced the relevant Statuary Instruments S.I. No. 340 and S.I. No. 290 of 2005 and related amendments. S.I. No. 149 of 2014 goes further than the WEEE Directive 2012/19/EU:

- retailers can no longer use CA sites to dispose of WEEE;
- distance retailers must authorise a local agent to take responsibility for their WEEE obligations;
- detailed guidance is provided on how information is provided to EEE users/consumers, including specific requirements with regard to the signage and other information that retailers display/provide;
- retailers must keep records for at least 2 years of WEEE collected and given to compliance schemes;
- visible environmental management costs (vEMCs) were reintroduced for some categories of WEEE as a result of several studies which indicated that the levels of historic WEEE had been underestimated (Huisman *et al.*, 2008; Johnson and Fitzpatrick, 2014) and will run until 2020.

Table 1.3. Recovery and recycling targets as per WEEE Directive 2012/19/EU

Category	Rate of recovery (%)	Rate of reuse/ recycling (%)
1 and 4	85	80
2	80	70
5 and 6	75	55
3	Not applicable	80

Ireland has been achieving EU targets for collection, reuse, recycling and recovery of WEEE and is increasing its WEEE collection (Eurostat, 2018; EPA, 2014; WEEE Ireland, 2017). In 2012, 40,818 tonnes of household WEEE were collected, amounting to 7.5 kg/capita. This was double the 4 kg/capita EU target that applied in 2012. Based on the most recent data reported to the European Commission in 2014 (Eurostat, 2014), Ireland is achieving targets for all WEEE categories (EPA Statistics, 2017). Based on 2014 Eurostat data, Ireland was among the top 10 countries in the EU in terms of the household WEEE collection rate, at 8.073 kg/capita (behind Lichtenstein, 8.267 kg/capita; Austria, 8.984 kg/capita; Luxembourg, 9.843 kg/capita; Belgium, 9.923 kg/capita; Finland, 11.185 kg/capita; Denmark, 12.328 kg/capita; Sweden, 13.629 kg/capita; and Norway, 14.924 kg/capita). In 2015, based on data from the two compliance schemes (ERP, 2016; WEEE Ireland, 2016), Ireland surpassed the EU target (4 kg/capita) and the national target (7.6 kg/capita) by a combined average of circa 9 kg/capita of household WEEE (combined from the WEEE Ireland and ERP Ireland annual reports from 2015). Partial data from 2016 (WEEE Ireland, 2017) also indicate success in achieving the increased EU target of 45% of the average weight of EEE placed on the market in the previous 3 years.

Regardless of this success, however, additional pressures occur because of the refined categories and further increasing EU targets, which will rise to 65% of the average weight of EEE placed on the market in the previous 3 years by 2019 or 85% of WEEE arising. In addition, there are indications that only 30% of small WEEE was collected according to WEEE Ireland (2017). Finally, the increased weight target is challenging considering the reduction in the weight of screens collected as a result of the shift away from box televisions to flat screens (WEEE Ireland, 2017). As a result, increased attention should be given to

the small WEEE and information and communication technology (ICT) categories. Based on WEEE Ireland data (WEEE Ireland, 2016, 2017), household WEEE collection rates were close to the 65% target in 2015 and approximately 67% in 2016 (Table 1.4).

However, this is likely to face downward pressure as the collection of heavier cathode ray tube (CRT)-containing devices will gradually decline and be replaced by the collection of lighter flat screens. The same effect will likely be seen with regard to heavier desktop computers, with these being substituted for lighter laptops and tablets. What is also notable are the high collection rates for large household appliances and fridge/freezers. Much of this is attributed to the new contribution schemes being made available to electrical retailers to support the storage and handling of WEEE that they take back and the marketing of free recycling services to customers. Of concern here, though, are the relatively low collection rates for small household appliances, consumer equipment, lamps, luminaires and tools. Finally, it is reported that based on survey results 11% of people put small WEEE in the general waste and 80% of people hoard waste and obsolete IT gadgets at home (WEEE Ireland, 2017).

1.3.1 WEEE producer's responsibility model

The Irish WEEE producer's responsibility model was developed in response to the first WEEE Directive. The overview in Figure 1.1 includes the primary actors in the formal WEEE collection system.

The Environmental Protection Agency's (EPA) Office of Environmental Responsibility enforces WEEE and battery regulations in Ireland; in turn, local authorities enforce many retailer obligations. Household WEEE producers can fulfil their obligations either individually or through compliance schemes, which are operated by two producer responsibility organisations (PROs): WEEE Ireland and European Recycling Platform (ERP). The PROs are non-profit organisations, established to meet their member's obligations. They have been approved by the Minister for the Environment, Community and Local Government and operate in accordance with conditions determined by the Minister. Non-household WEEE operators must self-comply and report directly to the EPA, as they are not permitted to join a PRO. Regardless of how EEE retailers operate they are obliged to provide consumers with a means of disposing of their WEEE and to carry relevant information about WEEE-related issues (Johnson and Fitzpatrick, 2014).

Table 1.4. Household WEEE collection rates

EEE category	2015 (%)	2016 (%)
Fridge/freezers	63	69
Large household appliances	74	83
Small household appliances	25	26
IT and telecommunications equipment	62	62
Monitors	638	231
Consumer equipment	50	59
Televisions	146	169
Lamps	43	38
Luminaires	36	33
Tools	19	40

Source: based on data from WEEE Ireland (2016, 2017).

Producer Register Limited (PRL) is Ireland's registration body. PRL maintains a register of producers and authorised representatives, determines the market share of producers, establishes and maintains a register of organisations that prepare WEEE for reuse, works with the ministry to approve and register such organisations, tracks and reports non-compliance to local authorities and the EPA, verifies that producers have offered sufficient financial security and verifies vEMCs (Johnson and Fitzpatrick, 2014).

Consumers have ownership of EEE before it becomes WEEE and make pertinent purchasing, use and disposal decisions, which impact the life cycle of the appliances. Take-back systems based on retailer legal obligations include (1) free take-back of WEEE when purchasing a new item or similar EEE; (2) free take-back (without purchasing a new or similar item) for batteries; and (3) free take-back (without the need to purchase new or similar item) for small WEEE for shops with a sales area of at least 400 m^2. Table 1.5 outlines the nine key stakeholders with distinct roles and responsibilities involved in the Irish scheme.

1.3.2 Compliance schemes

All of the household WEEE producers in Ireland have joined one of the two PROs, WEEE Ireland and ERP, which were established in 2005 and 2002 respectively. The PROs collect waste via "collection points", which

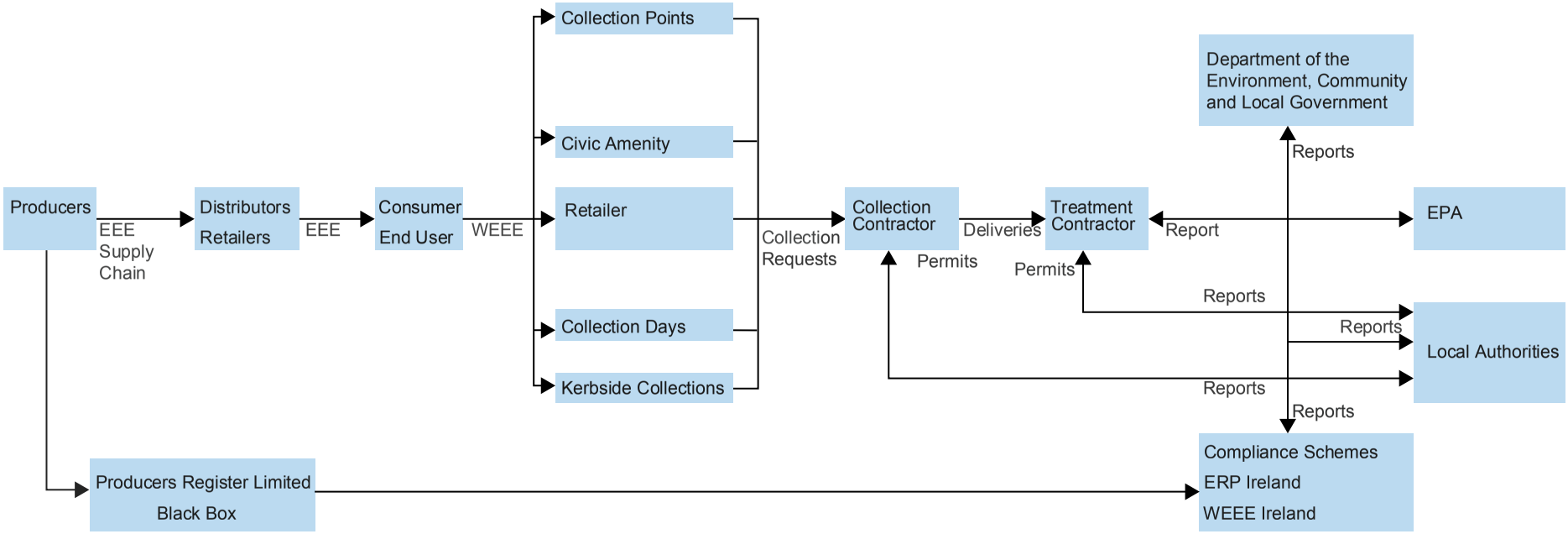

Figure 1.1. Irish WEEE producer's responsibility model (from Johnson and Fitzpatrick, 2014, p. 7).

Table 1.5. Key stakeholder roles and responsibilities

Stakeholder	Roles and responsibilities
Consumers	Take care of EEE so that others may use it when you have finished with it
	Bring back WEEE and waste batteries to retailer free of charge when you are buying a new item or similar EEE
	Bring back WEEE and waste batteries to local CA site for recycling if not brought back to or collected by the retailer
EEE/battery producers (importers)	Register with the WEEE Register Society
	Self-comply or join an approved compliance scheme (WEEE Ireland or ERP)
	Finance the take-back of WEEE and waste batteries
	Report quantities of EEE/batteries placed onto the Irish market
	Mark products with crossed-out wheelie bin symbol for WEEE and batteries
	Take back WEEE free of charge on a one-for-one, like-for-like basis. Arrange/provide take-back facilities for batteries
	Dispose of, store and transport WEEE and waste batteries as set out in the WEEE and Batteries Regulations
	Must meet collection, recovery and recycling targets for WEEE as per Schedule 10 of the WEEE Regulations
	Must meet collection targets for batteries as set out in Regulation 23(7) of the Battery Regulations
Retailers	Register premises with an approved compliance scheme (WEEE Ireland or ERP) or a local authority
	Distribute from a registered EEE producer supply chain; display the statutory notice
	Display vEMCs where applicable
	Inform consumers of the take-back and collection system(s) available to them
	Take back household WEEE free of charge when replacing on a one-for-one, like-for-like basis
	Take back waste batteries of a similar type to those sold
	Dispose of, store and transport WEEE and waste batteries as set out in the regulations
	Keep records
Recovery operators (facility for the deposit, refurbishment, treatment, recycling or recovery of WEEE)	Recover and recycle WEEE and waste batteries in line with recovery targets
	Must have relevant Waste Facility Permit/ Licence/ Certificate of Registration (COR) where applicable
	Store and/or treat WEEE and waste batteries in accordance with the requirements of the WEEE and Battery Regulations
	Record and maintain accurate records for WEEE and waste batteries
Local authorities	Local enforcement responsibilities
	Management of CA sites
EPA	Leads national enforcement of the WEEE and Battery Regulations
	Self-complying producers are required to report to the EPA
	Promotion of eco-design and reuse of EEE
WEEE Register Society Ltd	National producer registration body
	Registration of producers of EEE and batteries
	Notify EPA when evidence of non-compliance is encountered
	Determine which categories/subcategories EEE products belong to
	Determination of market share of individual producers
WEEE Ireland and ERP	Approved producer compliance schemes
	Provide collection of WEEE from the collection points on behalf of producers who join the compliance scheme
	Producers who join a compliance scheme are exempt from certain individual obligations, including reporting to the EPA
Department of the Environment, Community and Local Government	Issues/amends the WEEE and Battery Regulations
	Hosts WEEE Monitoring Group

Source: adopted from EPA (2015).

include CA recycling centres (about 100 in Ireland), public collection days, schools, workplaces and public buildings and retailer collection points:

- **WEEE Ireland**: WEEE Ireland holds 74% of the market share with 920 members (WEEE Ireland, 2017) and is contracted to collect WEEE and waste batteries in 18 of the 26 Irish counties. The scheme provides over 5000 battery or WEEE collection points. The organisation runs several recycling initiatives including ""WEEE Pledge", a free battery recycling programme designed for schools; "We'll Take It Back", a programme delivering the e-waste recycling message through retailer collection points in communities across Ireland; "The Great Bulb Exchange", a national CFL (compact fluorescent lamp) recycling campaign; and public collection days, which involve free WEEE collection sites being made available across the country.
- **European Recycling Platform**: ERP holds circa 26.94% of the market share with 122 members and is responsible for eight counties (ERP, 2016). The scheme provides 4500 battery collection points and 300 WEEE collection points across the eight local authorities and also runs several recycling initiatives including "Batteries for Barretstown", an initiative aimed at increasing awareness of battery recycling and raising much-needed funds for the children's charity; "Go Recycle and Win", which promotes battery and WEEE recycling through educational programmes to preschools and primary and secondary schools; "We'll Take It Back", a programme delivering the e-waste recycling message through retailer collection points in communities across Ireland; the "Green Christmas campaign", which promotes WEEE and battery recycling during the festive season; "Junk Kouture Recycled Fashion Competition", a national competition for secondary school students in Ireland and Northern Ireland; and free electrical recycling drop-off events in areas without easy access to CA sites.

1.4 Report Structure

Ireland is currently meeting the targets set by the WEEE Directives. However, high collection rates occur predominantly in the categories of large household appliances and fridges/freezers. Collection rates for smaller WEEE are less successful by comparison. Worryingly, people tend to hoard obsolete and broken small WEEE at home. Given these issues, this study focuses on examining behaviours in relation to small WEEE. Chapter 2 provides a comprehensive literature review on WEEE-related behaviours and attitudes, paying close attention to small WEEE. This is followed by the methodology (Chapter 3), which gives an overview of the quasi-ethnographic approach adopted for the research and the methods of data collection and analysis employed. The findings of the study are presented in the next three chapters (Chapters 4–6). Finally, the conclusions and recommendations of the study are discussed in Chapter 7.

2 Literature Review

2.1 Introduction

Efficient infrastructures are indispensable to the success of recycling campaigns; however, consumers are the most important and dynamic element of WEEE recycling initiatives (Gurauskienė, 2008; Dwivedy and Mittal, 2013; Sivathanu, 2016). It is therefore crucial to develop an understanding of a variety of related consumer recycling issues: the barriers and motivations that hinder or drive responsible waste management, consumer recycling behaviour and any determinants that might predict how consumers dispose of their waste, as well as any other factors that contribute to recycling behaviour (Abeliotis *et al*., 2006; Martin *et al*., 2006; Pérez-Belis *et al*., 2017). For example, developing knowledge about the type and amount of EEE in any home as well as the quantities and kinds of products that consumers have stored is necessary to design a comprehensive WEEE collection system (J. Li *et al.*, 2012); understanding why and how frequently consumers replace EEE is necessary to forecast future EEE demands and WEEE management (Afroz *et al.*, 2013; Pérez-Belis *et al.*, 2017).

WEEE recycling research is most often quantitative, consisting of questionnaires that are generally administered on the street, via the mail or the internet or in the respondent's home. Song *et al.* (2016) conducted 250 interviews during which questionnaires were administered; responses were analysed using SPSS software. Several studies applied mixed methods, beginning with a survey and then drawing on qualitative techniques such as focus groups, interviews and diaries to generate rich data and more detailed findings (Darby and Obara, 2005). Alternatively, some studies have used a questionnaire with both open- and closed-ended questions (Speake and Nchawa Yangke, 2015).

2.2 Themes and Models Explored in the WEEE Literature

In the context of general recycling policymakers often rely on research informed by environmental psychology, which examines the impact of attitude, beliefs or norms as determinants of individual behaviour (Saphores *et al*., 2012). WEEE recycling research has followed a similar trajectory, often focusing on the same issues. To date, the majority of research on consumer attitudes and behaviours regarding WEEE aims to encourage responsible WEEE management to reduce this growing waste stream and to better the management of WEEE disposal. European research tends to focus on WEEE recycling in the context of achieving the targets established in Directive 2012/19/EU (recast) on WEEE or the Directive's predecessor. Other research streams include a small body of research from the USA and an expanse of WEEE research from the Global South, including India, China and Macau. Several prominent issues have been identified across the literature streams including consumers' tendency to store obsolete[1] or inoperative WEEE (Abeliotis *et al*., 2006; Ongondo and Williams, 2011b; Saritha *et al*., 2015; Speake and Nchawa Yangke, 2015; Pérez-Belis *et al.*, 2017), willingness to pay for recycling or improved WEEE collection methods (Nixon and Saphores, 2007; Afroz *et al.*, 2013; La Barbera *et al*., 2014; Song *et al*., 2016), willingness to recycle WEEE (Saphores *et al.*, 2006; Nnorom *et al*., 2009; B. Li *et al.*, 2012; Dwivedy and Mittal, 2013; Speake and Nchawa Yangke, 2015; Song *et al*., 2016) and willingness to pay more for environmentally friendly products (Saphores *et al.*, 2007; Speake and Nchawa Yangke, 2015).

"Attitude" is understood as "a negative or positive feeling towards a specific object . . . [which] precedes behaviour and guides our choices and decisions for action" (Speake and Nchawa Yangke, 2015, p. 246). Attitudes are developed via direct experience with the object in question and through the socialisation

1 "Obsolete" does not necessarily mean that the products are inoperative, rather that they are perceived as technologically lacking. These products are referred to as "end of use" equipment, indicating their potential use value (Ongondo and Williams, 2011a; Yla-Mella et al., 2015).

process. Attitude works to filter information and shape one's perception of the world; together with knowledge, skills and aspirations, attitude can determine both an individual's behaviour and his or her ability to change (Speake and Nchawa Yangke, 2015). Research on attitudes and behaviours with regard to waste management tends to focus on household waste (Davies *et al*., 2005a; Martin *et al*., 2006; Sidique *et al*., 2010; Saphores and Nixon, 2014); however, there is a growing body of research that focuses on WEEE (Darby and Obara, 2005; Pérez-Belis *et al*., 2015; Sarath *et al*., 2015).

Research on attitudes towards recycling is often informed by one of two approaches. The first is based on an understanding of people as "egoistic utility maximizers" whose "behaviour can be regulated by an adequate manipulation of rewards and punishments" (Mannetti *et al*., 2004, p. 227). The second perspective, that is, the "attitude approach", draws on a number of models that attempt to account for the beliefs and attitudes that determine behaviour. These include the value–attitude–behaviour model (McCarty and Shrum, 1994), the theory of reasoned actions and Ajzen's (1991) theory of planned behaviour (Tonglet *et al*., 2004; Knussen and Yule, 2008; Botetzagias *et al*., 2015). Furthermore, numerous studies focus on the effect of socio-economic and demographic factors, social norms, morality, pro-environmental attitudes (environmental concern) and attitudes towards recycling (do Valle *et al*., 2004; Miafodzyeva and Brandt, 2013; Gonul Kochan *et al*., 2016).

WEEE research also explores consumer willingness to pay more for an environmentally friendly product (J. Li *et al*., 2012; Speake and Nchawa Yangke, 2015). Findings imply that the majority of respondents would be willing to pay more for sturdier, environmentally friendlier phones (Nnorom *et al*., 2009; Speake and Nchawa Yangke, 2015). Nnorom *et al.* (2009). Findings also suggest that consumers are willing to pay a premium for green phones. The same research indicates a correlation between age and the size of said premium, with those aged over 65 years tending to be willing to pay less than a 10% premium and those aged between 16 and 65 years being prepared to pay more than a 10% premium. The authors found that willingness to pay this premium is related to knowledge and concern regarding environmental deterioration. This point is supported by Saphores *et al.* (2012).

Willingness to pay an advanced recycling fee (ARF) has also been investigated; the findings are, again, incongruous. Some research has indicated that consumers are willing to pay a 1–10% (of the product cost) ARF (Saphores *et al*., 2007; Dwivedy and Mittal, 2013). However, Wang *et al*, (2011) found that the majority of their respondents, regardless of income, were unwilling to pay for e-waste recycling unless it was legally enforced; the context of this research was China. It is worth noting that, in the EU, the use of a visible fee for household WEEE (a recycling fee explicitly mentioned as an additional component in the price of a product) is not allowed in some Member States, such as Sweden and Greece, whereas in others, such as the Netherlands and Ireland, it is mandatory, at least for some product categories (Magalini and Huisman, 2007).

2.2.1 Small WEEE

Thus far, small WEEE (except mobile phones) has been neglected in the literature despite the fact that it is proving to be a complicated issue. Large household WEEE constitutes the majority of WEEE in weight; however, small and medium WEEE is more numerous and less likely to be disposed of responsibly. In 2015 the collection rates were as follows: 2.2 million tonnes of large household WEEE (52% of the total WEEE collected), 639,984 tonnes of ICT equipment (17% of the total WEEE collected), 599,050 tonnes of consumer equipment (15% of the total WEEE collected), 368,493 tonnes of small household appliances (10% of the total WEEE collected) and 267,355 tonnes of all "other" types of WEEE (7% of the total WEEE collected) (Eurostat, 2018). Given the range of products that fall into the small WEEE category, their short lifespan and the high incidence of such products in modern homes, the amount of small WEEE collected is low (Wilkinson and Duffy, 2003). Research suggests several possible reasons for this disparity including a lack of awareness on the part of consumers about the recyclability of small WEEE goods, the perceived disproportion of individual disposal fees (Wilkinson and Duffy, 2003), the fact that small WEEE are often disposable products not designed to be upgraded, repaired or reused (Darby and Obara, 2005) and consumers using informal collection channels (Martinho *et al*., 2017); the final factor considered relevant is the WEEE flow – the time between when the item is made obsolete and when it

is delivered for recycling (Martinho *et al.*, 2017). WEEE Ireland's latest environmental report (WEEE Ireland, 2017) found that 80% of people have small WEEE or unused gadgets stored in their homes.

Within the broader category of small WEEE, mobile phones have emerged as being particularly problematic, primarily because of the WEEE flow (Ongondo and Williams, 2011b; Speake and Nchawa Yangke, 2015; Wilson *et al.*, 2017), i.e. mobile phones are regularly replaced but retain a high residual value. Thus, consumers tend to store them (Darby and Obara, 2005; Speake and Nchawa Yangke, 2015; Wilson *et al.*, 2017). In 2015, the number of stockpiled mobile phones was estimated to be about 70 million in the UK alone, with approximately 25% of retired mobile phones recovered via take-back schemes (Speake and Nchawa Yangke, 2015). Ylä-Mella *et al.* (2015) approximate that 85% of consumers store idle mobile phones. Speake and Yangke (2015) explored consumers' reasons for storing their old phones; the most commonly cited response was "no reason", followed by "as a backup", "it's obsolete", "because of its value" and finally because consumers "do not know where or how to recycle it". Ylä-Mella *et al.* (2015) and Ongondo and Williams (2011a) are consistent in their findings that 17% and 30% of their respondents, respectively, stated that they stockpile their phones because they do not know what to do with them, a finding that was further corroborated in the broader context of WEEE in a Jordanian study (Fraige *et al.*, 2012). Remarkably, Ylä-Mella *et al.* (2015) found that despite the fact that respondents were aware that mobile phones should be recycled 85% stockpiled their old phones. Welfens *et al.* (2016) ascertain that the strong emotional identification that consumers tend to form with their mobile phones later influences their decision not to discard or recycle them. On a practical level, they argue that consumers tend to store photographs and other personal data on their phones. Speake and Nchawa Yangke (2015) found that, in the context of mobile phones, take-back schemes are still underused. In fact, only 38% of their respondents were aware of take-back schemes, despite them being advertised on the internet, in newspapers and on the television.

Regardless of motivation, this is a problematic practice, as mobile phones are both a source of valuable secondary raw materials and a hazardous waste stream (Speake and Nchawa Yangke, 2015). Mobile phones are often composed of over 40 metals including copper, tin, antimony, indium, gold and palladium, all of which are included on the EU's list of "potentially critical raw materials" (Ongondo and Williams, 2011a). Hence, although only 4% of mobile phones are disposed of via the general waste, they represent one of the most valuable electronic products present in general waste streams (Dalrymple *et al.*, 2007; Speake and Nchawa Yangke, 2015). Additionally, technological advancement has increased the consumption of electronics and reduced the lifespan of various products, none more so than mobile phones, which have become the fastest growing constituent of WEEE (Speake and Nchawa Yangke, 2015).

Darby and Obara (2005) note that many of their respondents indicated that they had never given the disposal of small WEEE any real thought; they found that 26% of small WEEE is disposed of via the general waste. This is a disconcertingly common practice although the reported figures vary: in the study by Pérez-Belis *et al.* (2017) 90.84% of their respondents indicated that they threw their small WEEE in the domestic garbage (only 6.63% recycled it), whereas a figure of 72.8% was reported in India (Saritha *et al*., 2015) and Abeliotis *et al*. (2006) reported similar findings in Greece, where 82% of their respondents disposed of their small WEEE via the general waste. WEEE Ireland estimates that 11% of householders also put their small WEEE in the general waste (WEEE Ireland, 2017). Darby and Obara (2005) theorise that consumers may dispose of their small WEEE in this manner purely because of the size of the items, i.e. small WEEE is easier to dispose of via the general waste. Respondents in one study attributed some of their irresponsible waste management behaviours to their personality (Davies *et al.*, 2005b). However, the authors note that the traits that the interviewees described as determined by their personality were actually habits and therefore flexible (Davies *et al.*, 2005b). Consumer recycling habits are "notoriously difficult to change" (Darby and Obara, 2005, p. 25) and thus it is imperative that we develop a clear understanding of the barriers that must be overcome for the WEEE Directive to be successful.

Consumers' reasons for disposing of EEE have attracted some attention (Abeliotis *et al*., 2006; Gutiérrez *et al.*, 2011a; Dindarian *et al*., 2012; J. Li

et al., 2012). These studies contribute to knowledge about barriers to recycling WEEE as well as quantitative/qualitative traits of WEEE, the lifetime of EEE and hurdles to reusing WEEE (Pérez-Belis *et al.*, 2017). Small EEE tends to last between 4 and 8 years (Chi *et al*., 2014; Pérez-Belis *et al.*, 2017) whereas larger EEE (refrigerators, televisions) tends to last longer (Gutiérrez *et al.*, 2011a). Research is conflicted as to why EEE is replaced; malfunction is cited as a recurring impetus, as is technological obsolescence (Gutiérrez *et al.*, 2011b; Afroz *et al.*, 2013; Saritha *et al*., 2015; Islam *et al.*, 2016). This may be dependent on the appliance in question, for example mobile phones are very often replaced merely because service providers offer consumers an upgrade (Speake and Nchawa Yangke, 2015). Consumers cite the cost of reparations as the primary reason for their not repairing EEE; some EEE products are simply cheaper to replace.

2.2.2 Correlates

A significant, and growing, body of research focuses on the correlation between socio-economic and demographic variables, such as income, education and age, and positive recycling behaviour. This stream continues to yield mixed results in the context of general recycling, an assertion that holds true for WEEE recycling research (Saphores *et al.*, 2006; Dwivedy and Mittal, 2013):

- **Gender**: The relationship between gender and recycling has been researched heavily; however, the findings are inconsistent. Some authors (Barr *et al*., 2003; Saphores *et al.*, 2006; Ongondo and Williams, 2011a) indicate that women tend to engage in waste-related activities and pro-environmental behaviour. This finding holds in the context of mobile phones, with research showing that more women are willing to recycle mobile phones than men (Speake and Nchawa Yangke, 2015). According to Darby and Obara (2005), overall, men are more likely to visit CA sites than women although women who recycle tend to visit CA sites as regularly as men – the authors suggest that this may be because regular female recyclers are aware of the recycling facilities at CA sites. However, the majority of research depicts gender as unimportant in determining the recycling behaviour of householders (Saphores *et al.*, 2006; Miafodzyeva and Brandt, 2013).
- **Age**: Age is the most researched variable. Saphores *et al.* (2006) found that adults between the ages of 36 and 65 years are always willing to recycle (despite having more work/family obligations); when combined with convenience and experience with recycling, the findings suggest that this age group is likely to be “very willing” to recycle. In contrast, Speake and Nchawa Yangke (2015) found that people aged between 25 and 29 years are more willing to recycle mobile phones. However, do Valle *et al*. (2004) found that, as recycling has become more prevalent in society, the age variable has become less relevant, showing no correlation with recycling behaviour.
- **Education**: Similarly, a connection between level of education/years of schooling and recycling behaviour has also been widely studied, with inconsistent findings (Miafodzyeva and Brandt, 2013). With regard to WEEE, Saphores *et al.* (2006) found that those without a college education are always “somewhat willing” to bring WEEE to recycling centres; if they have experience with recycling and it is convenient, they are more likely to be “very willing” to participate. Wang *et al.* (2011) found no correlation between education and willingness to recycle WEEE.
- **Income/occupation**: The majority of research has found a correlation between income levels and recycling (Darby and Obara, 2005; Martin *et al*., 2006; López-Mosquera *et al*., 2015). However, some studies have found no correlation (Saphores *et al.*, 2006; Wang *et al.*, 2011). Despite the ambiguous findings around general recycling and household income, Darby and Obara (2005) argue that income may impact how WEEE is disposed of; those in lower income bands tend to visit CA sites less frequently (and therefore recycle less) than those with higher incomes. However, lower income households are more likely to give items away for reuse whereas higher incomes households, despite visiting CA sites more regularly, generate more waste (Darby and Obara, 2005). Speake and Nchawa Yangke (2015) found that skilled workers and students are more willing to recycle mobile phones than unskilled workers.
- **Other considerations**: Socio-demographic factors that have been explored in less depth

include dwellings, ethnicity, household size and political ideology (Saphores *et al.*, 2006). Notwithstanding the inconsistent results that this stream has generated, researchers continue to produce largely atheoretical, contradictory research. Saphores *et al.* (2006) argue that general attitudes towards the environment, environmental activism and convenience need to be explored to develop a better understanding of willingness to recycle WEEE. Recent research has taken a slightly different approach, exploring the factors that may influence recycling behaviour.

2.2.3 Influential factors

Factors that have consistently been shown to impact recycling behaviour include knowledge, habits, economic factors, subjective attitudes towards WEEE and personal and social norms (Darby and Obara, 2005; Welfens *et al*., 2016). Welfens *et al*. (2016) segregate these factors into internal drivers and barriers and external drivers and barriers. Internal factors are socio-cultural in nature and tend to operate at the level of the individual, whereas external factors are systemic, institutional and structural – these emerge and operate at a corporate or political level (Welfens *et al*., 2016).

- **Norms**: Personal norms, such as recycling behaviour, are influenced by the behaviours and attitudes of relevant social groups (do Valle *et al.*, 2004). Thus, when recycling is the group "norm", members tend to hold positive views towards recycling and this factor is a driver. Conversely, when recycling is viewed negatively this factor is a barrier. It is argued that with widespread access to recycling facilities in the developed world recycling has become a social norm (Thomas and Sharp, 2013; Baxter and Gram-Hanssen, 2016). Taking account of social norms has proven an important, if under-researched, consideration when researching recycling behaviour. More broadly, Dwivedy and Mittal (2013) note that to design a suitable WEEE management system it is necessary to develop an understanding of the culture in which the "dynamics of material flow takes place" (p. 50). Dwivedy and Mittal's (2013) research on e-waste recycling in India highlights the importance of contextual difference. For example, their findings indicate that respondents' most important considerations when disposing of WEEE were the "best exchange offer" or "best price" offered for their e-waste. For example, in the context of their research, Indian consumers had traditionally sold their waste to hawkers, to scrap dealers or on the second-hand market and thus a robust informal market exists. The authors argue that this informal market poses a threat to the success of alternative e-waste collection initiatives. Differences across international contexts have been explored in relation to general recycling; Van Beukering and Van Den Bergh (2006) have summarised that high wages are correlated with "strict environmental regulation and stronger environmental awareness" (p. 8), thus recycling is encouraged in high-income countries. Economical secondary products are in demand in developing countries. Additionally, culture shapes individual behaviour (Hansmann *et al.*, 2006; Nnorom *et al*., 2009). These results corroborate those of Wang *et al.* (2011), who found that Chinese consumers, although concerned about how their e-waste was disposed of, were still willing to sell it to peddlers as they offered the best price and the most convenient option.
- **Attitudes**: A negative attitude and a lack of responsibility towards the environment will serve as a barrier to recycling WEEE whereas a positive attitude and a strong sense of responsibility will encourage recycling. Pre-1990 research found that there was a significant relationship between pro-environmental attitudes and general recycling; however, since the early 1990s the evidence has been mixed, perhaps because of shifting attitudes and the availability of recycling services (Saphores *et al.*, 2006). However, despite this complication, attitudinal research continues to advance. Davies *et al.* (2005a) found that 86% of respondents state that they are concerned or very concerned about the environment. Interestingly, environmentally orientated attitudes do not always translate into environmentally positive behaviours. For example, in the context of mobile phone recycling, Speake and Nchawa Yangke (2015) found that 86% of participants stockpiled their phones despite the fact that 84% reported that mobile phones should be recycled. This dissonance has been termed the "attitude–behaviour gap". This gap is most evident when consumers are self-reporting on a behaviour that they perceive as ethically sound (Darby and Obara, 2005; Davies *et al.*, 2005b;

Martin *et al*., 2006; Papaoikonomou *et al*., 2011; Moraes *et al*., 2012; Chatzidakis *et al*., 2016). Recycling is an activity that falls prey to the "gap" – consumers report having an interest in the welfare of the environment but recycling rates do not reflect this. Environmental attitudes have been deeply scrutinised in the context of environmental behaviour – environmental concern can be understood as "as an evaluation of, or an attitude towards facts, one's own behaviour, or others' behaviour with consequences for the environment" (Schultz, 2000, p. 370). Four orientations have been identified: first, the new environmental paradigm, which takes an ecocentric approach; second, anthropocentric concern, which is motivated by the impact that a degraded environment will have on mankind; third, concern based on self-interest; and, finally, the fourth kind of concern is a function of religious or ideological beliefs (Stern, 1992; Fransson and Gärling, 1999). Recycling research may benefit from a more nuanced understanding of concern.

- **Habits**: Habits can be described as the "outcome of shared conventions, competences, images and material resources and due to the impacts of social systems . . . practices (habits) are a set of established objectives, procedures and understandings" (Welfens *et al*., 2016, p. 112). When the consumer has developed positive recycling habits in relation to other waste streams (glass, plastic, cardboard, paper, etc.) he/she will tend to cultivate positive WEEE recycling habits. For example, findings indicate that those who regularly recycled at CA sites or via kerbside collections were more likely to also recycle small WEEE (Darby and Obara, 2005). Similarly, Saphores *et al.* (2006) found that when householders have access to kerbside collections for their general household recyclables they are more willing (their willingness doubles) to bring WEEE to be recycled. Congruent with these findings, Wang *et al.* (2011) found that, when their respondents were in the habit of recycling, generally they would also recycle their e-waste. This may be because those who regularly recycle tend to want to dispose of their WEEE responsibly or it may be due to a "spillover" effect, "whereby the act of recycling other items has led to a change of behaviour when respondents select a disposal route for small WEEE" (Darby and Obara, 2005, p. 30).
- **Knowledge**: When consumers are sufficiently aware of the issue at hand (the need to recycle) they are more likely to participate in the relevant activity (WEEE recycling) and this factor acts as a driver for recycling behaviour. In contrast, when the consumer is unaware of the necessity to recycle this factor becomes a barrier. Consumer awareness can be further broken down – low-level construal concerns an awareness around the recycling system whereas high-level construal refers to a more sophisticated, abstract understanding of why one should recycle. Care should be taken in relation to knowledge; some research suggests that ignorance is not the most significant inhibitory factor (Ylä-Mella *et al*., 2015; Baxter and Gram-Hanssen, 2016). On the other hand, several studies indicate that one of the major contributors to consumers' lack of participation in WEEE recycling is a lack of awareness; it is estimated that 75% of WEEE is retained because of a lack of awareness (Darby and Obara, 2005; Saritha *et al*., 2015; Speake and Nchawa Yangke, 2015; Song *et al*., 2016). The role of knowledge (or lack thereof) has proven critical in developing an understanding of how and why consumers dispose of their small WEEE inappropriately.
- **Economic incentives**: Incentive schemes that offer immediate compensation for the return of WEEE drive recycling behaviour. In addition, research suggests that consumers, aware that some small WEEE retain residual economic value, store these products for so long that they depreciate (Ylä-Mella *et al*., 2015; Baxter and Gram-Hanssen, 2016; Welfens *et al*., 2016). Baxter and Gram-Hanssen (2016) argue that, from a "life cycle" perspective, retaining small WEEE, although largely perceived by consumers as an environmentally neutral act, is actually closer to an irresponsible behaviour given the fact that extracting virgin materials could be avoided if those products were recycled. Several authors suggest that financial incentives would reduce the period for which consumers retain small WEEE (Ylä-Mella *et al*., 2015). Welfens *et al*. (2016) suggest that economic incentives, communication and education would be particularly useful in the

context of small WEEE and ICT. In fact, Ongondo and Williams (2011a) suggest that willingness to recycle mobile phones is strongly influenced by the kinds of incentives being offered – cash was the strongest incentive, followed by vouchers, ease of use, convenience, charity, prize draw and then the environment.

- **Infrastructures**: Access to WEEE recycling infrastructures can act as a driver/barrier to recycling. The review of the WEEE Directive (Huisman *et al*., 2008) states that there are insufficient data available to prove relationships between factors influencing high and low collection amounts in different Member States but the data available indicate that certain factors such as the availability of collection points, geography, culture, waste collection mechanisms and financing mechanisms influence performance. For example, the most successful WEEE recycling scheme, the Swedish El-Kretsen system, combines dense and convenient collection infrastructure with high-profile advertising campaigns (Gorecki, 2014). A more recent study comparing Sweden, Denmark, Germany, Switzerland and Belgium found a reasonable relationship between the density of collection sites and the amount of WEEE collected ($R2$=0.69) but warns against simplistic transferal of the results as it is likely that there are multiple correlations at play (Friege *et al.*, 2015). Furthermore, municipal waste or collection schemes are the most convenient means by which to dispose of large WEEE. Small WEEE, on the other hand, is easily disposed of via general waste or stored and thus presents as more problematic.
- **Perceived effort**: Perceived effort concerns the cost/benefit ratio of an action. When consumers feel that there is a low personal cost associated with an action they are more likely to partake and this factor is a driver. However, when consumers perceive the activity as costly this factor becomes a barrier. Several studies have considered situational factors such as convenience and access to recycling and information about recycling. Congruent with findings which suggest that environmental attitudes do not predict recycling behaviour, De Young (1988) found that recyclers and non-recyclers hold similar views towards recycling; the factor that determines whether they recycled or not is convenience. This aligns with economic arguments which suggest that positive waste management is more likely when convenient and cost-effective facilities exist (Davies *et al.*, 2005a; Saphores *et al.*, 2006; Wang *et al.*, 2011; Byrne and O'Regan, 2014; Saritha *et al*., 2015). There is evidence to suggest that convenience is also a key determinant in the recycling of WEEE. For example, Saphores *et al.* (2006) found that, when there was a CA site within 5 miles, respondents were twice as likely to be willing to drop off their WEEE. An exception was found for respondents living in rural communities without kerbside collections. In that case, respondents were more likely to bring WEEE to recycling centres. The authors deduce that this may be because respondents were already bringing their waste to centres (Saphores *et al.*, 2006). In general, there are two kinds of inconvenience. The first revolves around issues such as a lack of storage space, perceived recycling-related risks or excessive time obligations. The second requires consumers to bring recyclables to a drop-off point. Because of the second inconvenience, kerbside collection schemes have consistently proved more effective than recycling centres (Saphores *et al*., 2012).
- **Education and communication**: These factors, although external, have a direct connection with the internal factor, knowledge. Darby and Obara (2005) found that householders must be made aware of the fact that small WEEE should be recycled. This is supported by Speake and Nchawa Yangke' s (2015) findings that 14.8% of respondents stated that mobile phones should be disposed of via the general waste, 10% suggested that they be burned and a further 7.6% said that they did not know what to do with unused mobile phones. They argue that councils need to launch similar awareness-raising campaigns about small WEEE to those about other forms of waste to engage households (Darby and Obara, 2005).

2.3 Implications

Research indicates that both suitable infrastructure and appropriate information are required if consumers are to successfully recycle (Darby and Obara, 2005; Davies *et al.*, 2005a; Byrne and O'Regan, 2014; Ylä-Mella *et al.*, 2014; Speake and Nchawa Yangke, 2015). Davies *et al.* (2005a) found that householders want more information about recycling. Consequently,

recommendations for fostering positive waste management behaviours tend to include the provision of suitable information (Darby and Obara, 2005; Davies *et al.*, 2005a). However, content is important – respondents would appreciate "appropriate" information. Darby and Obara (2005) clarified this further – their findings indicated that householders "do not want information on why they need to recycle, but are more interested in how they can recycle" (p. 33).

Furthermore, research has identified a lack of consciousness around small WEEE. For example, Darby and Obara's (2005) respondents reported a lack of reflection with regard to the disposal of small WEEE – many did not consider small WEEE to be a "waste" akin to glass or paper, which had both been targeted by local authorities and required ongoing participation. In the same study (Darby and Obara, 2005), respondents claimed that they were ill-informed about how to recycle small WEEE and also disclosed that they most often dispose of it via the household refuse or general waste (landfills), as charity shops do not accept it. Knowledge of how consumers can recycle WEEE and the barriers to their participation in WEEE recycling will help determine the most suitable information to be provided. Thus, these initiatives can be tailored for different households. There are many avenues that authorities could explore with regard to the information distributed, for example several authors suggest that consumers need to be educated about the negative environmental impact of WEEE (Abeliotis *et al*., 2006; Wang *et al.*, 2011).

It has also been suggested that the development of appropriate infrastructure would increase participation in recycling (Darby and Obara, 2005; Davies *et al.*, 2005a). In general, small WEEE is either disposed of via general household waste disposal means (Darby and Obara, 2005; Dimitrakakis *et al.*, 2009; Pérez-Belis *et al.*, 2017) or placed in storage (Pérez-Belis *et al.*, 2017). To address this, several authors have suggested financial incentives – this warrants more detailed research. Currently, WEEE is understood and researched as an independent waste stream. Darby and Obara (2005) call for an integrated approach, arguing that integration is necessary if the targets in the WEEE Directive are to be met. Given that one of the most consistent findings in the whole research stream revolves around the "spillover" effect, it would seem that WEEE recycling should be considered in the context of general recycling.

Although largely ignored, context seems to shape how consumers think about and behave towards recycling in general and, as a consequence, WEEE recycling. Davies *et al.* (2005b) speak to the role of Irish culture in relation to waste management. Their findings imply that within Irish culture people tend to reject authoritative figures (such as the government) and are thus reluctant to follow recycling rules. Several respondents went on to draw comparisons between Ireland and other cultures, arguing that other countries were cleaner, and these respondents viewed Ireland's lack of facilities as a sign of cultural inferiority. This important contribution requires further development from the perspective of small WEEE. Davies *et al.* (2005a) also suggest that members of the public tend to emphasise the role of "end of pipe disposal mechanisms" (recycling, incinerating, landfills), failing to consider the alteration of consumption patterns as a means to reduce waste. In doing so, they not only demonstrate "limited understanding of the waste cycle" (Davies *et al.*, 2005a, p. 22) but also fail to recognise their own culpability in waste generation. This is unsurprising; it is accepted that changing consumption patterns is a complex endeavour, but a worthy one. Consumption should be addressed in the context of small WEEE, especially given the disposability of the products and their rapid evolution (Hobson, 2003; Davies *et al.*, 2005a).

Several obstacles to responsible waste management have been identified, including a lack of facilities (landfills) and broader social concerns (e.g. conspicuous consumption in a throwaway society) (Davies *et al.*, 2005a). Research in the Irish context mirrors similar research conducted in the UK (Welsh Consumer Council, 2002, cited in Darby and Obara, 2005) in identifying the following barriers to recycling household waste: insufficient local facilities, laziness, no time, inability to sort waste, not a priority, easiest option, no storage space, no transport and no information (Davies *et al.*, 2005a).

To summarise, what is evident from the literature is the importance of a holistic, situated approach. First, research into attitudes and behaviours has concluded that pro-environmental attitudes do not necessarily translate into positive behaviours (the famous attitude–behaviour gap). This is evident in the existence of persistent irresponsible small WEEE disposal practices, including disposing of small WEEE via the general household waste. Second, institutional and

structural factors affect individual behaviour. This is evident in the apparent difficulty so far in establishing consistent demographic characteristics across different studies. This raises the issue of context. Consumers' everyday disposition behaviours are dependent on the socio-technical and socio-cultural contexts in which these behaviours occur.

3 Methodology

3.1 Introduction

This study took a quasi-ethnographic approach, drawing on ethnographic research principles to examine WEEE disposal from an emic perspective, that is, to examine consumer experiences and interpretations of WEEE disposal as these are situated within the context of consumers' everyday lives. This approach seeks understandings of human behaviour that are cultural and social rather than cognitive (Arnould and Wallendorf, 1994), recognising that people do not always do what they say they do and are not always reliable predictors of their own behaviour (Elliott and Jankel-Elliott, 2003). Given the famous problem of the "attitude–behaviour" gap in relation to people's engagement with sustainable practices, the recognition that behaviour is rooted in cultural and social contexts was of paramount relevance to the research.

The goal of ethnography is to learn from the "native point of view" (Spradley, 1979), that is, "the context and subjective significance (emic) of experience for particular groups of persons" (Arnould and Wallendorf, 1994, p. 485). It therefore seeks to understand "action in context" (Arnould, 1998). It also seeks to "convey the comparative and interpreted (etic) cultural significance of this experience" (Arnould and Wallendorf, 1994, p. 485) and elucidate the differences between the world of the group being studied and that of a particular audience (Arnould and Wallendorf, 1994). In the case of WEEE, this study responded to the need to bring emic accounts and meanings of WEEE to an audience of relevant stakeholders involved in WEEE policymaking and implementation.

Particularistic rather than generalising in orientation, ethnographic research relies on extended participation in a given cultural context and employs data collected through the use of multiple methods (Arnould, 1998). Given the applied nature of the project and scope of the task at hand, it was not possible to conduct a traditional ethnography, which would require extended periods of observation of naturally occurring behaviour. The project required a more pragmatic approach to yield results within the specified time frame. In addition, WEEE disposal behaviour is highly irregular and thus difficult to observe when naturally occurring. The research conducted was therefore quasi-ethnographic, emulating market-oriented ethnographies, which are applied in nature (Elliott and Jankel-Elliott, 2003), focus on a specific task, product or market and are conducted in generally shorter periods than traditional ethnographies. The approach involved shorter periods of observation of WEEE recycling in relevant sites and ethnographic interviews at people's houses, augmented by photographic documentation of WEEE.

3.2 Fieldwork

Fieldwork took place from September to December 2017 in the Munster region of Ireland. Data collection consisted of 26 in-depth interviews with 30 participants (Table 3.1), observations and casual conversations at a CA site and waste collection event and participant observation at 25 retailers.

3.2.1 Interviews

The interviews lasted from 40 minutes to 2 hours and took place in the participants' homes to allow observation of the WEEE stored in the house and to trigger participant reflection and storytelling. Interviews were recorded with the permission of participants. Photographs of the stored WEEE were taken when permitted. Keeping with the ethics of ethnographic interviewing (Spradley, 1979), explanations were provided to participants in advance of each interview in relation to the purpose of the project as well as the nature of the interview and the recording mechanisms. Participant anonymity and interview confidentiality were protected by keeping the unprocessed data from the interviews confidential and giving participants fictional names (pseudonyms).

Because of the intimate nature of the interviews and the need to conduct interviews in participants' homes, participants were recruited using snowball sampling, relying on the researchers' networks for referrals. Participants were recruited from four counties of the Munster region: Limerick ($n = 19$), Cork ($n = 6$), Tipperary ($n = 3$) and Clare ($n = 2$). The sample is not

Table 3.1. Participants' profiles

Pseudonym	Age (years)	Occupation	Relationship status
Eva-Maria	26	Shop manager	Single
Grainne	36	Teacher	In a relationship
Jennifer	30	Software technician	Single
Nerea	28	Engineer	Co-habiting
Fiona	29	Project manager	Co-habiting
Ben	27	PhD student	Co-habiting
Sandra	36	Social worker	Single
Reuben	27	Software developer	In a relationship
Lexi	26	Student	Single
Ralph	32	Mature student	Single
Toby	31	Mature student	Single
Cornelius	25	Trainee accountant	In a relationship
Kathleen	60	Retired teacher	Married, three adult children
Fionn	19	Student	Single
Katherine	37	Doctor	Married
Peter	35	Accountant	Married
Mae	26	Student	Single
Ellen	63	Retired manager	Divorced, two adult children
Connor	45	Manager	Single
Dolly	24	Student	Single
Marjie	55	Carer	Married, three children
Dan	31	Engineer	Co-habiting
Laurence	37	Lecturer	In a relationship
Martin	22	Student	Single
James	51	Lecturer	Married, five children
Rory	45	Project manager	Married, three children
Barbara	42	Homemaker	Married, three children
Tom	42	Engineer	Married, three children
Mick	45	Engineer	Married, two children
Manuel	30	PhD student	Single

meant to be a representative sample of the population but rather to be indicative of a range of different types of people and contexts (see Table 3.1).

Consistent with the aim of ethnographic interviewing to elicit detailed emic accounts, that is, people's value-laden stories through which they make sense of their own and others' behaviours (Arnould and Wallendorf, 1994), the interviews can be best described as conversations with a purpose. In line with the conversational mode (Kvale, 2008), interviews were conducted as a "series of friendly conversations into which the researcher slowly introduces new elements to assist informants to respond as informants" (Spradley, 1979, p. 58). In doing so, the interviewers enquired about participants' personal circumstances and interests; their relationship with technological products; their awareness of small WEEE; their most commonly used devices; their memories of old devices and their journeys; their experiences with disposal of electronics; their awareness of WEEE policies; and, finally, their attitudes towards recycling in general. The purpose was to obtain rich accounts of participants' experiences in relation to WEEE.

3.2.2 Observations

Researchers observed behaviours at two collection sites: a CA centre located in Limerick and a farm hazardous waste collection event that took place in Cahir, Tipperary. This facilitated both the observation of consumer WEEE recycling behaviour at these sites and casual conversation with site employees.

Additionally, researchers conducted observations in three retail centres: two in Limerick and one in Cork. The purpose of the observations was to obtain first-hand experience of what it is like for a consumer to avail of the take-back policy. Researchers took back small WEEE to different retailers to explore this. In total, 25 retailers were visited, ranging from retailers specialising in electrical and electronic equipment to supermarkets and homeware stores that include electrical and electronic products in their ranges. It is important to note that this was not a "mystery shopping" exercise; the researchers were not attempting to ascertain the degree of compliance of particular retailers with the take-back policy. Instead, the researchers were examining the consumer perspective, that is, what the actual experience of the take-back policy feels like. For this purpose, individual retailer details are not provided. Researchers' field notes assisted observations.

3.3 Interpretation and Analysis

Whereas with ethnographic research the interpretation of data begins in the field (as patterns are observed during fieldwork), systematic analysis started once the fieldwork was completed. Rich textual data were produced from the interviews and observations in the form of interview transcripts and field notes. Interviews were fully transcribed generating 680 pages of text. The data were analysed thematically to identify important meanings around WEEE disposal, as well as disjunctures in participants' stories, revelatory moments and behavioural irregularities (Arnould and Wallendorf, 1994). Situated between the forms of holistic-content and categorical-content narrative analysis (Lieblich *et al*., 1998), the analysis identified thematic categories within and across the different interviews. Each transcript was read and reread carefully by two researchers, who coded the data thematically. The researchers then compared and contrasted themes with each other to refine the themes. However, effort was made not to decontextualize the themes from each interview story as the aim of the analysis was for rich, contextual understandings rather than acontextual codes. Each theme identified was supported by verbatim quotations from the interviews so that the meanings were interpreted in context. Consistent with the research approach, quotations from the interviews are presented to reveal the deeper contexts of each theme.

3.4 Key Themes

The findings presented in the next three chapters reveal that the clear-cut categorisation of EEE and WEEE – even more so in the case of small WEEE – in policy frameworks is far removed from consumers' use and understanding of electrical and electronic devices in their everyday lives. People do not make sense of their devices in this manner. For consumers, electronic and electrical devices exist in more fluid, in-between states of meaning and perceived value, from the time they enter one's life until their disposition. The following chapters present emic understandings of WEEE disposal through a four-stage journey, a process that EEE typically goes through before divestment. In the first stage, once EEE is no longer used it tends to be either consciously stored or abandoned throughout the home. The second stage describes a trigger that prompts consumers to divest – an event termed "critical moment". Then, provoked to action, consumers must decide what precisely to discard, a process termed as the transition from EEE to WEEE, which is the third stage. The final stage in this course is the actual divestment of the WEEE. It is at this point that participants decide whether to recycle or not.

4 The Story of "Stuff"

4.1 Introduction

Accelerating technological development drives electronic consumption and, by default, waste generation. Technological innovation means a near constant commodity turnover: consumers replace working EEE with more efficient, more advanced or more attractive alternatives. Working EEE also falls out of use, the symptom of a forsaken hobby or an unwanted gift. This research explores both the consumer experience of this "waste" and the consumer/EEE relationship. Findings indicate that participants do not view their disused or even unwanted EEE as "waste" – for them it is "stuff". Furthermore, participants tended to be unsure of how to deal with the very small WEEE – the cables and other peripherals. Thus, these are effectively ignored. In contrast, stored EEE is often carefully curated. Participants make this decision based on three considerations: their use potential, either in whole or in part, and emotional attachment.

4.2 Stage 1(a): Abandoned Electronics

Once EEE falls into disuse, whether it is damaged, broken, replaced or obsolete, the participants tended to just abandon it, so unwanted EEE lurks behind picture frames, hangs from shelves and hides in drawers "somewhere" (Figures 4.1 and 4.2). Lexi describes how she simply left her old phone in her mother's home (Figure 4.3):

> It's in a vase in my house, in my Mum's house. I don't know, I didn't put it there. I brought it home, and I said "this is useless to me now that I have got a new phone". I think that I just left it on the counter one day, obviously probably not where it was supposed to go, but somehow it ended up in the vase in the kitchen.

Lexi's description is representative of how participants approach this recurring problem. Findings indicate that unwanted EEE is merely put away, not consciously stored (Figures 4.1–4.4) – instead, it takes its place amongst other unwanted, homeless items, old Christmas cards, lockless keys and old bills. These objects represent a more complicated relationship with "waste" than other commodities – items that are better described as "stuff". Not only is EEE stored with other

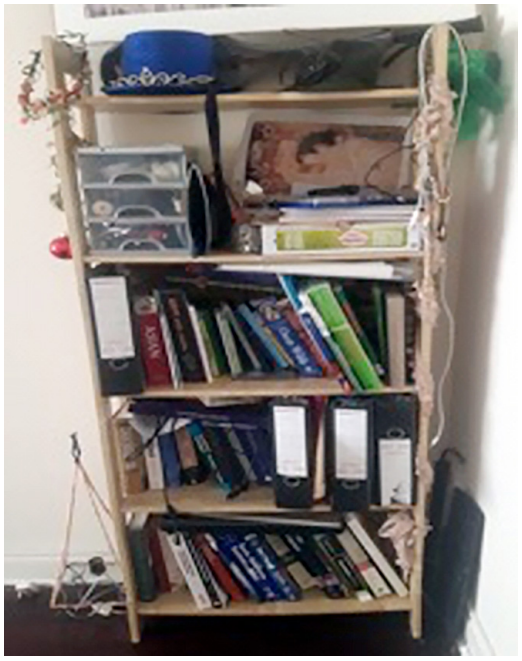

Figure 4.1. Abandoned electronics.

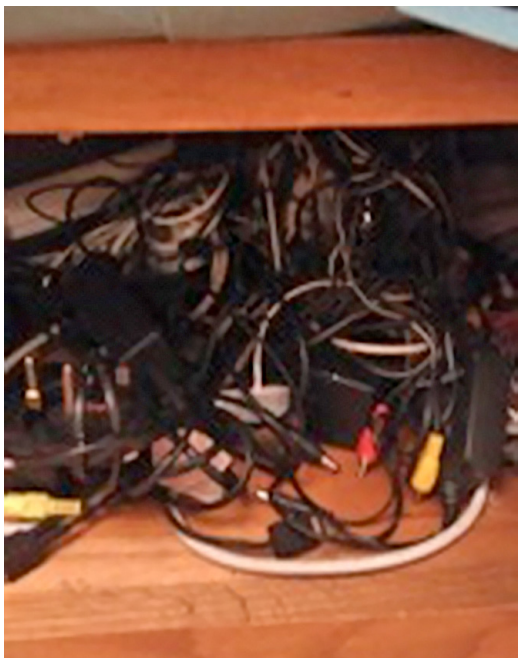

Figure 4.2. James's drawer.

Figure 4.3. Lexi's abandoned phone.

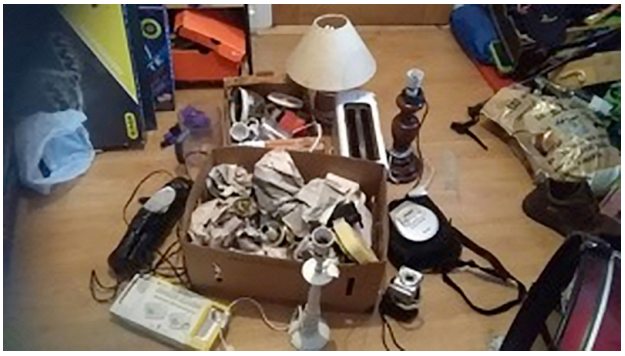

Figure 4.4. One of Lexi's parents' boxes.

stuff, but also broken EEE and unwanted EEE are stored together, to be dealt with at a later point:

> Grainne: Yeah. This is the drawer. That's not too bad. I think I cleaned that one out lately enough. I think this is the real culprit here.
>
> Researcher: Oh my God.
>
> Grainne: Yeah. Like that is a Bluetooth thing I got off a boyfriend once, that you stick up in the car.
>
> Researcher: Does it work?
>
> Grainne: It didn't really ever work very well. Now some of these things aren't mine, they are just left here. I think that is some kind of internet connection. This is an old camera. That's just general, kind of, junk. [Broken] headphones, yeah, I just leave them in here.

The drawer in Grainne's home contains her old EEE (some broken, some unwanted, some obsolete) as well as that of past residents. She acknowledges that much of the deviant drawer's content is "junk"; however, she is not perturbed by this fact, neither is she concerned that others have abandoned their waste in her home. In this context, abandoned WEEE is "clean" and therefore inoffensive. This is a unique characteristic of WEEE and one that merits a brief discussion. When WEEE is stored in the home it is not a contaminant. However, as is evidenced by Martin below, when WEEE is discarded outdoors it becomes problematic:

> Martin: To be fair, like three weeks ago, I saw a pair of headphones on the floor that were broken, and I took it, and I threw it in the bin. Save the Planet.
>
> Researcher: So, you don't recycle in public?
>
> Martin: You are right, but it's better than when it's rotting somewhere in nature like. I think there is still a difference between throwing something away and burning it, that's not environmentally friendly, but there is still a difference to just throwing it out into the woods like. It's just unnecessary. I don't know.

Martin describes finding a broken pair of headphones in the street and putting them in the bin. When probed about his decision he argues that discarding the headphones in the general waste bin was the most responsible option, with the alternative being leaving them to decompose in nature. This is an iteration of the ideology of cleanliness, when discarded in nature WEEE becomes dirty refuse, a rotting contaminant and an offence against order, which requires prompt redress:

> Dirt is essentially disorder. There is no such thing as absolute dirt: it exists in the eye of the beholder. If we shun dirt, it is not because of craven fear, still less dread of holy terror. Nor do our ideas about disease account for the range of our behaviour in cleaning or avoiding dirt. Dirt offends against order. Eliminating it is

> not a negative movement, but a positive effort to organise the environment (Douglas, 2002 [1966], p. 2).

Whilst in the home WEEE does not offend order, unlike most other forms of waste. Storing WEEE is not socially unacceptable – the dirt that renders general household waste offensive, a contaminant, is absent. Whereas eliminating "dirt" is a positive behaviour deserving of immediate attention, addressing WEEE in the home is more neutral – it does not need to be addressed with any urgency. Indeed, it can be completely ignored:

> Lexi: There were five boxes of them. Five boxes filled with this stuff. The boxes would be, like the stuff that you get in [name of super-market], those shaped boxes. Then I put them all outside of their door. So, they literally had to fall over it in the morning to get away from this thing so that they wouldn't avoid it and pretend that it doesn't exist. They just moved it out of the way, and now they continue to walk past it. This was four years ago. They still don't acknowledge the boxes of stuff. I have been like, look through it, tell me what you want, throw it out. They just walk past it. They don't acknowledge it.

The boxes Lexi talks about can be seen in Figure 4.4. This excerpt demonstrates the lack of urgency around used or broken EEE divestment. It also highlights another quality of WEEE – a lot of EEE slowly descends to obsolescence, when a decision must be made about its transition to WEEE. This process is in stark contrast to the fate of typical recyclable waste. WEEE is simply not imbued with the properties of "waste" as most consumers understand it. Even when consumers determine an individual piece of EEE to be "waste", the journey to the waste stream is not assured; the cleanliness that allows EEE to defy the laws of waste also allows WEEE's continued retention. Several participants indicated that they do not know what to do with certain items; this is especially true of cables, "peripherals" and "components", which once disused quickly melt into the domestic landscape, disappear into drawers and slip onto shelves. This is possible because WEEE is clean and can easily be stored without consequence. Very small EEE is particularly problematic: not only is it easily stored, but also the participants struggled to categorise it, which leads to confusion about its disposal:

> Katherine: What if it's a component, it's not even a full thing? You know, a bit of a wire or something, or a thing, and you are thinking, you know . . .

> James: You know that they don't go in the normal recycling bin, but where do they go? They sit at home, and they, kind of, multiply at night in the dark when everybody is gone to sleep. [. . .] I suppose, it's not that I don't know about being able to recycle, but when I think of recycling I don't think about the cables in the same way that I think of them, I don't think of the peripherals in the same way as I think of the electrical goods, do you know what I mean?

Katherine describes cabling as "not even a full thing", "a bit of a wire", highlighting the primary difficulty that people encounter with disposing of this kind of WEEE. Despite lacking value, peripherals are often stored purely because they are difficult to categorise. James is an environmentalist; he is well read about ecological issues and especially waste, he regularly recycles his WEEE both via large stores and at the recycling centres and yet he has never considered peripherals in terms of recycling. Cables are ubiquitous; received in some form with almost every technological device they seem to consume drawers and shelves (see Figures 4.1 and 4.2). This finding speaks directly to how consumers think and feel about their electrical goods and highlights the vast difference between how the consumer categorises used or broken EEE and how WEEE is classified in policy.

Abandonment can be prolonged, but it is not everlasting; at some point participants engage in a divestment/retirement process during which they take time to evaluate individual pieces of EEE to determine whether they are disposed of or retired:

> Peter: I don't know what to do with this because this one dropped in the toilet. And it ceased to work. That is what prompted me to get the phone that I have today. So, this one is completely dead. So, I don't know what I am going to do

with it. So, until I decide what to do with it, it is going to live there, but eventually, it might end up going into retirement.

Researcher: Okay. When does it stop being like an old phone that doesn't work, and start being junk?

Peter: I think there's a process that happens every so often when a clear-out happens, or a clear-ance of these shelves happens. Sometimes the items get spared. Then it is put off until the next clear-out. Then sometimes they actually go into another box.

Peter is speaking about a phone that had been stored, quite curiously, behind a perfectly sized picture frame. As he speaks he gazes at the phone in his hand; he is clearly struggling with the notion that the phone is irretrievable, despite the fact that he has not used it in 6 months, when it stopped working. He decides that it should join the large collection of EEE that he has in his attic. These consciously stored possessions are spared from the waste stream. This excerpt underscores the complicated relationship between consumers and their EEE. The EEE described in this section is essentially stored by default; the following section explores how consumers relate to the EEE that they no longer really use but are unwilling to define as waste.

4.3 Stage 1(b): Consciously Stored Electronics

The decision to store used or broken EEE is driven by the consumer value derived from the goods. Consciously stored EEE is put somewhere intentionally, and tidily. For example, Lexi carefully packs her spare or back-up electrical devices in a convenient bag (Figure 4.5), Connor has a room where he stores most of his unused equipment, arranged as if it is still being used (Figure 4.6), and Peter washes out appropriately sized ice-cream containers in which to organise his "collection". Many of the participants are conscious of this habit, referring to the behaviour as "hoarding". Hoarding can be associated with an ideology of frugality: "the fundamental emotion underlying the hoarding standpoint [is] financial insecurity" (Diesing, 2005, p. 19). Storage is time-consuming because it requires thought and space. Frugality, on the other hand, can be defined as the "sparing in the use of money, goods and resources with a particular emphasis on careful consumption and the avoidance of waste" (Evans, 2011, p. 552). This research reveals three factors, which are drawn on to determine which EEE is consciously stored, namely, use potential, useful oddments and emotional attachment.

Figure 4.5. Carefully stored small WEEE.

Figure 4.6. Some of Connor's unused EEE.

4.3.1 Use potential

Use potential is the most commonly cited reason for conscious EEE storage. Consumers are inclined to believe that their old EEE will, at some point, be useful: that it will provide a back-up in an emergency, serve some unforeseen purpose or be valuable to another person. Connor reported loathing throwing away stuff when "there's nothing wrong with it", given that someone else could use it (Figure 4.7). Once use potential has been identified, that object retains or even regains value; this is evident in how consumers treat these things:

> Reuben: The [bits of an old PC] are currently stored in a box to go to my brother-in-law, who really wants to get into playing PC games and does, he is after going back to College as well, and works in [name of fast food store], and doesn't have the money to do it. So, I am waiting to get one or two final pieces and then give him the machine. If he will get the use out of it, rather than it going to a landfill or trying to make sure that it gets recycled properly like, it's way better.

Participants regularly store this kind of EEE on behalf of members of their social network (with or without their knowledge). Reuben diligently collects the pieces of his PC, discarded in favour of improved components. He intends to eventually gift them, combined with new parts, as a whole machine to his brother in law. As a whole, the PC components will recapture some of the original value. Parents collect phones for their children, friends gift old electronics to one another and grandparents offer old kitchen tools to their grandchildren. This kind of approach is a manifestation of prevailing ideologies: conservation or frugality as well as altruism. This approach has an added benefit: Reuben believes that gifting his PC is the most environmentally responsible decision. He knows that sending it to landfill is negative. However, he expresses some scepticism about whether his PC will be recycled correctly. EEE moves through social networks until it is defunct.

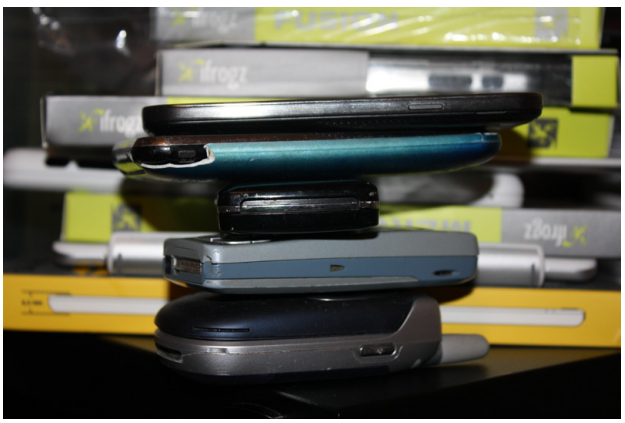

Figure 4.7. Connor's collection of mobile phones.

> James: You know, I could actually tell you where our old video player is. It's in my parents-in-law's house over in Wexford.
>
> Researcher: And do they use it?
>
> James: They don't. [. . .]
>
> Researcher: Why didn't you recycle it?
>
> James: Because my brother-in-law is a dab hand with doing, kind of, nifty things, like converting video to DVD.

James transported an old VCR player 170 km to make it accessible to his brother in law. However, the VCR is still in his relatives' home – the potential remains despite the probable futility of the exercise. Despite the resources required to store EEE, it is often stored for several years; it eventually becomes obsolete, entombed, and is forgotten. This is especially the case when back-up cables and components are stored for technology that becomes obsolete. Research shows that consumers store EEE as a back-up (generally phones and various chargers). The findings suggest that they do so regardless of whether they think they will be of use in the future. For example, Laurence keeps his old phones, notwithstanding the expected ineffectuality of doing so:

> Laurence: I think [my old phone] is still at home as a back-up. Yeah, and my previous one and my previous one. Some of them I bring into college, if I like the design, as examples. Then you can dismantle them. Our students can dismantle them and see how they are made and different things. But most of them are just sitting on a shelf, either as showpieces or else they are at home, with the idea of, "if this ever breaks" . . . Which it hasn't, as a back-up, but that is never going to happen. I know that, but I keep it anyway.

Several consumers described this kind of conflict: they know that keeping their old EEE is most often fruitless and tend to be somewhat critical of their assortment, and yet they are loath to discard potentially useful EEE. This research generates some important consumer insights with regard to the characterisation of "waste" (and therefore WEEE). This is another example of how consumers think about their disused electrical goods; for them, they are laden with untapped potential – they are more than viable "stuff". Whether or not the participants actually mine that potential with any consistency does not determine whether they keep their "stuff":

> Peter: Well, that's the other thing as well, I mean the collection of things I got, they might not be all complete pieces, they might be . . . USB cables, or internet cables, they are not part of anything, they are things that might one day be useful. Which, actually turned out true on Monday when we had the storm. I was working from home, and I had the new monitor, I had my work laptop, and I was thinking could I use the two screens together. So, I was rummaging around up in the box to see if I could find an item, which I had my mind on; it was an HDMI cable, which I could connect into the back. But it wasn't there, it didn't work the way that I thought it would, but I found another wire, which was slightly bulkier, a different way of connecting them up together, and it worked. So, I actually had something in that box that was actually of some use.

Here, Peter excitedly describes an occasion when one piece of his vast collection, a composite of components and peripherals, did prove useful, thereby vindicating his decision to keep it. It is this potential use value of old electrical goods that drives Reuben, James, Peter and Laurence to store their old EEE. Storing EEE is often considered to be an innocuous behaviour (Baxter and Gram-Hanssen, 2016); consumers tend to be of the opinion that, although the waste is in their home, it is harmless. The retention of WEEE is not a value-based decision. In this case, both Laurence and James are environmentalists, participating in local campaigns and sitting on various environmental boards. James is an active member of the Zero Waste movement; he has partaken in several anti-incinerator protests and regularly approaches large retailers about the reduction in use of food packaging. However, both participants knowingly store old electrical goods that are no longer in use. This finding is demonstrative of a disconnect between stored WEEE and environmental degradation.

Finally, use potential is subjective. In the following excerpt Katherine actually sees Peter's collection of EEE (Figure 4.8), some of which he had shipped to Ireland from his previous home in the UK. Until the interview Katherine was under the impression that they had very little EEE in their home:

> Peter: It's an external box, an enclosure, in which I can put the hard drive into it. So, I think it's only . . .
>
> Katherine: When is the last time you accessed that, Pete?
>
> Peter: Years ago. I think it's only about a 12 gigabyte. It's a massive thing as well; you can get memory sticks, which are smaller than this.
>
> Katherine: So, we can store one photo on it, Pete?

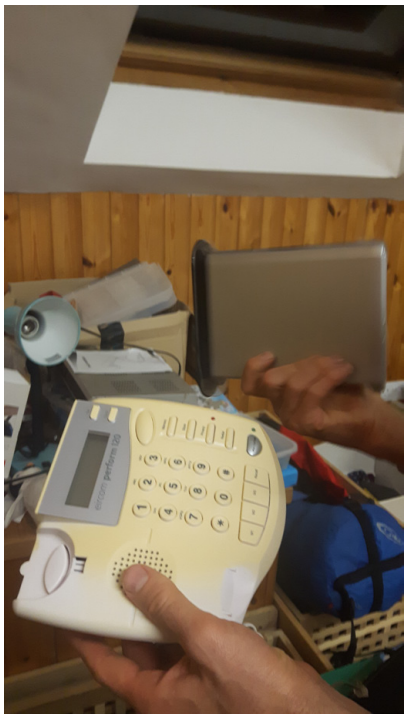

Figure 4.8. Some of Peter's collection.

Peter: What else have we got in here? We've got some or some more of the utensils and stuff. We've got the internet cables . . .

Katherine: Are you ashamed of yourself? Because I am ashamed of you . . .

Peter: Some leads. Some more headphones in here actually – look!!! Oh, we've got the power supply for the caddy.

4.3.2 Useful oddments

Whereas Peter referred to this box as a "treasure box" or the "real action", Katherine described it as a "box of sins". For Peter, each item holds potential; for Katherine, the vast majority of the box's content is trash. The line between trash and treasure is therefore arbitrary. A similar approach is applied to broken electronics, which can be dismantled and repurposed as part of something else or which are perceived as redeemable and are often stored as potentially useful oddments:

Marjie: He would keep toasters and kettles. He would keep everything; do you know what I mean. A lot of the electric stuff, he hates, old electrical stuff, he hates to part with, because it could be used for something. It will make something else. It will be adapted to do something else. Nuts, I know, but he does.

One significant difference between the two categories is that for damaged goods to be viewed as potentially useful the consumer must either be skilled him-/herself or have access to an appropriate skillset. In this case, access can either be through an acquaintance with relevant competencies or through an ability to develop or even mimic sufficient expertise. This can be applied to a relatively simple task – the removal of a fuse described by Dan – or to the more complex procedure described by Reuben:

Dan: I would probably take the fuse out of it first because fuses are handy. If a fuse breaks in a lamp, you can have another one. So, I would take the fuse out of it. Anything else really that's on it is not going to be much good to me like.

Reuben: But if you put two hard drives in a "stripe", essentially you have two destinations that you can read and write to at the same time, doubling your read speed and your write speed, and also combining two hard drives together. So, size wise, it looks like one, with double the read and write speed of a single one. So, I need to do that, and I just keep getting other jobs to do.

Reuben identifies "as someone that always tries to give new life to old hardware"; both he and Dan distinguish themselves as accomplished in the field of electronics. Skilled consumers evaluate the usefulness of broken EEE differently. For example, once, when renovating, Reuben "took all these phone cables apart, replaced all the wire, and then extended" the surround sound cables for a television. However, lacking the necessary skillset did not hamper some of the participants in their reclamation of broken EEE:

Cornelius: Well, the desktop, I took all the, I used it so much that it died, so I took all the functioning parts, like the RAM and hard drive out of it and put it in my new computer.

Researcher: Did you know how to?

Cornelius: Well, I suppose the internet told me. Like, YouTube, yeah. I just YouTubed and it told me how to do it. YouTube has step-by-step tutorials and all those things, so I just did it.

Cornelius described using YouTube to mimic the necessary skills required to repurpose the memory of his old laptop while James saves his broken EEE for members of his extended family with the required proficiencies. Further, participants tended to share stories of these triumphant moments – when inoperative EEE is restored or is once more made useful, against the odds. These stories then serve to justify the retention of potentially redeemable but defective EEE:

Ralph: But this watch is amazing, the only problem is the strap keeps breaking, because I have it in seawater a lot, the plastic rots and breaks off and anywhere I went they said, "you have to get these [special] straps, and you

might as well buy a new watch" and I'm like "this is a waste". So I have had two faces of this watch, with the strap broken, working perfectly just sitting at home, ticking away, and I had to buy another one . . . I got a new Casio watch a year ago, which, was way more bulky and it was not the same price, but, I couldn't get another one of these. Then, that strap came off, and I went into a jewellers with the one that had just broken, a few months ago, so I had two watch faces, and they were like "we can fix both of them and put straps on both of them" and, so, I went back to this one. The newer one I have sitting at home as back-up and the other one I gave to my brother and that was it, all three are back.

Discarding these useful oddments (or anything with use potential) is seen as wasteful and therefore undesirable: "I do feel sorry because I think that someone can use it [an old incapacitated laptop]" (Nerea). This attitude was most frequently expressed regarding EEE that was costly at the time of purchase. Often, participants saw keeping broken EEE to have it fixed or to use the parts to repair something else as an act of frugality.

4.3.3 Emotional attachment

Finally, consumers tended to store EEE because they experience an emotional attachment to specific items. This form of attachment comes in two forms. Participants described an emotional connection to the data (photographs, music, messages) stored on particular electrical goods: laptops, phones or cameras:

Sandra: I have my, that's my second laptop, my first one, which I had when, like fifteen years ago, or something, I don't know, is in probably, probably in the shed, because I have loads of information on it, loads of music from like back in the day, and I want to get it taken off. I just haven't brought it to anyone to do it.

James: It was a Nokia, and for a long time, I kept it partly because it had texts from my Dad, like that he had sent me shortly before he passed away.

Both Sandra and James speak about the importance of the contents of the equipment in question; in this case, the EEE could be described as a vessel. Whereas Sandra could transfer the data to an alternative device, James has little choice – and so his connection must endure. Data transfer was an issue for several participants, from an emotional perspective but also from a functional perspective. Several participants described the importance of data protection and some professed to never disposing of computers. This fear is exacerbated by media coverage:

Katherine: Apparently, there are some scams where people's personal data has been stolen. Like the laptop would be disposed of in, like Africa, and there are gangs over there who have actually retrieved data from the laptops and sold them.

Peter: That's quite a big thing in terms of corporate laptop stocks.

Katherine: It's huge. That's why I think before they used to, like a lot of organisations, if you have a corporate laptop they would allow you to keep it after the laptop had, kind of, expired. They would let you buy it personally and then go off with it, but that doesn't happen anymore like, I don't think because people are worried about what could be on it and whether it's been cleaned properly, you know. Anyway, yeah, that's what's interesting. I suppose like I guess, the thing with a laptop is when you are making a decision to dispose of it you have a whole ream of other things to consider as well. So, it's, kind of, almost like a slightly long finger job, you know?

The criminal behaviour that Katherine describes has been the subject of a documentary, which several of the participants had recently seen. It is a strong example of how the media can inform common views.

Other participants are so concerned about the pilfering of personal data on hard drives that they store them indefinitely:

> Mick: I have hard drives. Yeah. A drawer full of hard drives upstairs and everything else. I don't know, I probably should just smash them up. My logic was that if I put the hard drive down, I could have data there or anything. I wouldn't have a lot of sensitive data, but maybe bank records, correspondence on savings and that type of stuff alright. I suppose all your emails around insurance, house, you know, all that type of private stuff. So, yeah, I have held onto hard drives.

Mick works in the waste industry and regularly participates in WEEE recycling (returning WEEE on a one-for-one basis and recycling at CA sites). His vulnerability around the stored data is indicative of a deep scepticism about the whole WEEE recycling process. Even when participants were not concerned about criminal behaviour, they also tended to store their old laptops and hard drives for extended periods – putting the tedious data transfer on "long finger".

A few participants described feeling an emotional attachment to a particular artefact. In these cases, the consumers are knowingly storing old, often inoperative EEE for long periods of time. However, these feelings are limited to single objects, which hold special meaning for these consumers:

> Eva-Maria: I haven't even thought about [recycling an old laptop]. I have to, at some point, when I want to get rid of the laptop, but I think I just got a special attachment to it, maybe because it was my laptop during college. I don't know. It is very, very, old like.

Eva-Maria has a definitive connection with this specific piece of hardware; some other participants described having a similar relationship with mobile phones that they had purchased during their teens. However, for Eva-Maria, the connection with this object emerged during her time in college and has persisted.

Three ideological position themes were evident across conscious stored waste: frugality (keeping broken EEE with an intention to fix it or for some other use), altruism (storing EEE on behalf of another) and cleanliness (which explains the social acceptability of storing clean but obsolete EEE).

Electronic and electrical commodities are treated very differently by the participants – whereas abandoned devices seem to vanish from consumers' sight and consciousness, stored devices are carefully curated. Although consumers do not perceive their stored EEE to be waste, they do categorise their possessions, unconsciously, by how the goods are "stored".

4.4 Conclusion

The findings described in this chapter address a gap in the current body of WEEE recycling research: the lack of appreciation of the dynamics of stored WEEE in consumer homes. Although there is broad recognition that people tend to store or stockpile WEEE in their houses, less attention has been given to the meanings that people ascribe to their electronic and electrical possessions, even when these are disused or broken. A trend that highlights several unique qualities of small WEEE, in particular, is that its transition from something of value to trash is not as transparent as for its general waste counterparts. Whereas an empty bottle or yoghurt carton rapidly descends into something undesirable, EEE often slowly falls out of use. In addition, being small in size by nature, small WEEE hides behind picture frames and drawers and therefore, because of its familiarity and size, can become a part of the landscape, invisible to its owner. Finally, small WEEE is, in general, clean. In these ways electrical waste differs from most other forms of waste and it is unsurprising that consumers do not rush to final judgement on their once-valued possessions. Different levels of attachment to these possessions were manifested (1) because of their perceived use potential, either as devices or parts, and (2) because of an emotional bond with particular "special" objects or, given the nature of electronics, immaterial objects, such as the data (music, photographs, messages) stored in electronics. The term WEEE does not translate to meaningful categories in consumers' lives.

5 EEE to WEEE: A Life In-between

5.1 Introduction

The previous chapter explored the kinds of EEE abandoned or consciously stored in participants' homes, revealing the unconscious categorisation of electronic possessions. That which is valued is carefully stored whereas peripherals, smaller EEE and small pieces of broken EEE are simply abandoned. The findings presented in this chapter examine the conditions, labelled as the "critical moment", under which consumers are impelled to discard WEEE.

5.2 Stage 2: The "Critical Moment"

Often, participants described events or triggers that prompted a critical evaluation of both consciously stored and abandoned EEE in their homes. We have termed this trigger the "critical moment". A critical moment is likely to occur under specific conditions. One such moment is discussed by Ralph:

> I did a clear-out in January for various reasons. I was at home, and I was unemployed and I was trying to plan my life and one thing I noticed "I have all this crap I don't need" and I moved back from Galway and I had chargers that I didn't need, and there was printers, and there was more. I mean this much chargers [gestures], a pile of old Nokia ones, old phones, there was my Creative, the charger for that, mainly phone chargers and all that . . . and then I had two bags pretty full of stuff, and Kerry County Council had . . . I just looked up where to bring them, and Kerry had an electronic recycling centre, and I just brought them there, it was free. I knew there was a place in Galway and I thought there was one in Kerry as well.

Ralph's moment was instigated by a combination of factors: he had recently moved home and he was planning a new life. Because of his new outlook, he became conscious of the disused EEE that he had stored (the Creative, a music player containing an inaccessible but meaningful music collection) and that which had accumulated (the old Nokia chargers). Moving is often in itself a sufficiently powerful event to spur this kind of reflexivity and, for Ralph, it was certainly a factor. It would seem that the cumulative effect of his situation – changing career, moving home and making life-changing plans – culminated in the critical moment that drove his decision to divest, an exploit that we call "the purge". Additionally, it should be noted that Ralph did not simply make the decision to dump his collection of WEEE; he is deliberate in his account – he decided to recycle it. He had engaged in WEEE recycling in Galway and was keen to recycle the waste. He was not privy to the relevant information; however, he was willing to research it – for Ralph, recycling is worthy of his time and effort.

Change, in general, is often a catalyst for divestment. Several participants described the renovation of their home as a time when they had discarded old EEE:

> Ellen: I had reason to pull everything out of the attic and but the guy who was doing it, there were things like . . . there was a radio CD player a few things like that, but he took them away and recycled them. But I presume he was recycling them, he said he was taking them to the dump.
>
> Researcher: And was this a company that does that?
>
> Ellen: No, it was a man who's a builder, and he does that kind of work for me, and he had been putting down a floor in the attic, so I took the opportunity to get rid of that stuff. But he just took them away. But I know that he was taking them to the dump, so I presume he did.

Interestingly, although she decided to "get rid of that stuff", Ellen was not confident about where it went; the word "dump" is left undefined. In this case, a critical

moment, the renovations, induced the relinquishment of her unwanted property; it did not go as far as ensuring that the goods were disposed of responsibly. What happens to unwanted stuff after the purge is the subject of the following chapter. Another participant describes going beyond renovation:

> Martin: I guess I don't know like. The only times that things are actually getting thrown out are when we, like renovate in English [the participant is not a native English speaker].
>
> Researcher: Renovate. Yeah.
>
> Martin: Yeah. So, when you actually have to move everything out of the room, and you, kind of, go through whatever is in that room, and we are like, "oh, we don't need that anymore". That would be the only time. I think since everything is so scattered throughout the house in different positions, that there won't ever be a time when there is no electric waste in our house, you know. So, like I only can imagine that the only moment when that would happen would be about thirty, forty or fifty years. So, when my parents move out of the house to go to, like, some care institution, or like they die, and I have to, like, sort out the house or something. Other than that, I don't think there will be an actual effort made to throw everything out.

Martin highlights an important issue – the fate of old and broken EEE after the death or institutionalisation of its owners. Both prospects would certainly be a critical moment that would force the divestment of, at least some, disused EEE. This complex and emotional issue requires a great deal of sensitivity; however, it does represent an opportunity to recover WEEE.

Participants also portrayed situations in which they accrue sufficient WEEE to justify a visit to the CA site or, alternatively, have too much disused EEE to ignore:

> Katherine: Yeah, well I think, there are some like, I think it's almost like getting a critical mass of stuff as well, that you can actually go off and do it all in the one go, like go to the recycling and getting [pauses] . . . I feel like the box itself is a critical mass itself, so, you know.

Katherine describes this process as "getting a critical mass" – once this happens Katherine will take the time to evaluate the EEE and then conduct a bulk clear-out. Previously, Peter also described this process: it began with a clear-out or clearance and resulted in either the disposal or the conscious storage of abandoned EEE. It should be noted that, until Katherine decides whether to move it to storage, hold it in storage or dispose of it, the disused EEE is still "stuff".

Another critical moment that instigated EEE for disposal was the replacement of a large or important piece of technology. Mick, works in the waste industry and is somewhat conscious of WEEE recycling:

> Mick: Well, I am changing TV, and it is gone from having a box and having a surround sound system and having loads of different cables coming into it, and I now have a surround system that I need to dispose of, and the Sky box which I am getting rid of. So, there would have been a lot of scart cables with those, right. You would have DVD players or whatever. Nobody is using DVD players anymore. So, I actually have a small box of cables upstairs, but they are getting ready for disposal.

Mick has a collection of disused cables for disposal. However, the critical moment that is going to see them recycled is acquiring a new television. He explains that he now has an abundance of WEEE: disused cables, obsolete technology and an unwanted Sky box – a critical mass. He also describes a box of cables that is "getting ready for disposal" – it would seem that Mick stockpiles cables in one place before disposal.

Finally, several participants highlighted their tendency to donate certain kinds of EEE to charity:

> Reuben: They would have collected dust for a long time. Before the iPhone, before my first iPhone, all those phones would have gone to friends of the family, that would have needed them for, like, trade-ins for iPads, back when,

> like, a lot of the societies for people with mental difficulties, or mental disabilities would be getting iPads for, you know, kids that they would have joined those societies. So, Clare Crusader does a lot with kids with autism and stuff like that. So, a friend of the family has two kids with autism so they would have gotten all my phones in one lump.

At one point, Reuben donated all of the phones that he had collected to support a family friend. Other participants reported similar activity – several specifically mentioned a phone recycling initiative that was run by the Jack and Jill Children's Foundation until 2016. Similarly, participants spoke of the old "rag and bone" man who they would give their WEEE to, were he still around. Thus, "critical moments" are not always instigated by individual change; they can be prompted by an external entity, whether that entity has charitable motivations or not. Whereas in the examples in the previous chapter, the WEEE formed one category of "stuff" that needed to be disposed of, this final form of "critical moment" is tailored – directed at a discrete category of stuff – WEEE.

The inclination to purge their disused EEE marks the beginning of a reflexive process. Abandoned EEE tends to disappear, hide in nooks and crannies, blend seamlessly with the books and ornaments on shelves or colonise forgotten drawers. Partaking in this interview encouraged some participants to actively and reflexively consider the EEE and WEEE in their homes:

> Martin: I feel that there is a lot of technological garbage in our house now. There are a lot of cords, like lying around, but it's not like they are lying around everywhere or it's messy, it's all in, like, a place. Like in the working room. Like there are different pieces all over the house. Like the stuff that belongs to the Wii are in the drawers, and the TV and stuff like that. It's just a lot of electronics everywhere.

This excerpt captures the moment that Martin realises the volume of "technological garbage" in his home. In several situations, this realisation triggered a "purge", the divestment of some of the garbage. Again, we can identify how an ideology of cleanliness works against the disposition of WEEE – paradoxically, Martin describes the abandoned EEE as both "garbage" and not "messy". In general, participants do not consciously collect cables. However, cables tend to accumulate as participants purchase new ICT and other small EEE, which regularly includes a variety of charging cables. These kinds of things maintain their use potential until they are broken or obsolete, at which point they are generally discarded in the general waste or abandoned. When consumers can be impelled to reflexively engage with their surroundings, they may discover far more disused and unwanted EEE than they thought possible. Critical moments inspire reflexive engagement with abandoned EEE. Furthermore, critical moments encourage the re-evaluation of stored EEE. As stated earlier, Katherine discovered Peter's collection as a consequence of the interview:

> Peter: There will be a box of old, little old electronic wires or gizmos.
>
> Researcher: Can I see your drawer later?
>
> Peter: You can. You can. I will show it to you. But it will be chock full of these electronic items that we have gathered over time. And there might be some old, there might be an old pair of headphones that I might have used at work several years ago, computer headphones. There might be half a dozen USB cables. There might be some internet cables tucked away there. There might be a couple of old wireless routers that I have had from previous companies who haven't bothered collecting them. Things like those. I think there's an old cordless phone . . .
>
> Katherine: I think you are trying to convince me that we need to dump some stuff.
>
> Peter: Yeah, I do think we need to take it to the household waste at some point. But, again, its . . .

Once revealed, Peter's "box of old, little old electronic wires or gizmos" are in immediate danger. Katherine suggests that it may be time to "dump some stuff", a petition to which he quickly acquiesces, with only the

slightest hint of protestation. Following the interview Katherine, Peter, Lexi, Ben, Fiona and Reuben all divested of at least some of their WEEE. Participants who decided to discard some of their stored EEE reported taking a merciless approach to the re-evaluation of their EEE, even discarding emotionally resonant items. These excerpts further highlight the complexities around WEEE disposal; for EEE to be divested, it must be recognised as waste.

5.3 Stage 3: From "Stuff" to "Junk"

Once participants decide to divest of some of their stuff, the next step is the process of determining what to dispose of – what has transitioned from EEE to WEEE? When an item is broken, it is a natural decision – broken things have no value and are thus dispensable:

> Ben: Well, half the screen stopped responding to touch so I could have got it repaired, but the phone was probably not worth the value of the repair at that stage, so I got a new one.

Ben's last phone broke, irredeemably, and therefore rapidly became junk. However, one of the defining characteristics of e-waste is its, often, slow decline. In many cases, consumers will have to consciously reflect on the usefulness, value and meaningfulness of their EEE before deciding whether to divest. This is not always an easy decision. When asked when a long-disused tablet would become junk, Reuben responds:

> That's the, yeah, that's the hard question for me, as someone that always tries to give new life to old hardware. Is, when is that cut-off. I don't know, it hasn't happened yet. And I will have to go home and evaluate that now. I will go home and root that tablet out and stare at it, "are you rubbish yet?"

This issue is particularly difficult for the technologically skilled. Reuben defines himself as "someone that always tries to give new life to old hardware" and is thus somewhat dismayed at the thought of discarding this tablet, despite not knowing its whereabouts or whether or not it is still functional. This interview brought the tablet back into his consciousness and he feels obliged to make a hard decision – is it rubbish yet? James goes further still: he stores EEE on behalf of his brother-in-law, thereby avoiding a difficult decision. This kind of complexity is evident throughout the interviews: Peter struggles with the notion of discarding an obsolete phone, Nerea cannot quite let go of her first laptop and Mick may never dump his collection of hard drives. Decisions are made on a case-by-case basis:

> Martin: So, it's like Schrödinger's cat, kind of, scenario, where you don't know if it's alive or dead, it's just there somewhere.

Martin likens the situation to Schrödinger's cat: one never can know until one opens the box. How or when EEE becomes WEEE is difficult to define. Especially in the case of items that were still functional, in which participants struggled to see them as waste, even if they had no use for them. The line between EEE and WEEE is thin, based on subjective value decisions around use potential, emotional attachment and the effort required to complete the task (in the case of data-related retention). Although Ralph felt liberated by his decision to divest and Ellen was happy to take the opportunity, divestment is not always comfortable:

> Mae: I was just absorbing electronic devices until I could no longer keep them. And then when I moved . . . I just, I don't know, we just hoard things, that's what we do. Like, once we have something, we don't like to get rid of it, because we are never going to get it again . . . But, yeah, disposing of electronics comes pretty hard for me. Like, even if something doesn't work quite right like, I don't want to get rid of it . . . I think that a lot of people are like that. You know, as in, something is working, it's not perfect, but it does 80% of what it's meant to do.

> Lexi: That is the thing because you are going to wander around now and if you throw one of those things out. You are going to wander around, two weeks down the line, and you are going to find the cable that belongs to that. You will be like, noooooooo, it is that cable that I threw out. You are just going to kick yourself for a month.

For some, Mae included, actually owning (almost) functioning EEE offers some comfort. Other participants described the joy in fixing old objects, in problem-solving using the "tools" in their collection

and in keeping things for posterity. Mae's discomfort in divestment is embedded in frugality – she views any sort of disposition of EEE as a lost opportunity. For her, transitioning EEE to WEEE is disappointing and ominous and, in the past, she has sold electronic items in times of need. People in this situation may be less likely to divest unless under real pressure to do so or the resurrection of the items is impossible. Similarly, Lexi is loath to dispose of her back-up peripherals on the off-chance that she might need them again.

The criteria that determine whether EEE transitions to WEEE are deeply embedded in the same ideological discourses that guide EEE storage: frugality, cleanliness and altruism. We have seen that EEE storage is perceived as innocuous; thus, storing EEE for a little longer than necessary is not understood as a social harm.

5.4 Conclusion

This chapter explored the second and third stages of the divestment process: the "critical moment" and the categorisation from EEE to WEEE. Participants often described an event or change that prompted a "purge" – we have termed this the "critical moment". The "critical moment" is context bound, meaning that participants experienced the event differently and were impelled by different situations. When the decision was self-initiated it was triggered by some change; however, there are also examples of cases in which discrete kinds of WEEE (phones) were targeted by an external entity. Thus, there is an implication that "critical moments" can be triggered and once triggered consumers tend to consciously gather and evaluate their abandoned WEEE and then critically re-evaluate their stored EEE. The findings suggest that the considerations used to decide which EEE to keep mirror those related to conscious EEE storage presented in the previous chapter. An ideology of frugality, cleanliness and altruism also influences the transition from EEE to WEEE. Participants are inclined to store EEE for extended periods in case it is required in the future. Interventions aimed at instigating a critical moment must also consider this stage of the process.

6 The Final Stop

6.1 Introduction

Once consumers have decided, for one reason or another, to address the disused "stuff" in their homes and identified that which will be divested, they must determine how to dispose of their unwanted stuff, or waste. This chapter delves into disposition, participant knowledge and experience of the WEEE recycling process. The primary obstacles to WEEE recycling are also explored.

6.2 Stage 4: The Purge

The participants had all engaged in some form of WEEE recycling, most often the exchange of white WEEE on replacement. Additionally, several had taken advantage of the one-for-one scheme in stores and/or had visited their local CA site. However, there were some exceptions:

> Ellen: I took the opportunity to get rid of that stuff. But he just took them away. But I know that he was taking them to the dump, so I presume he did.

When renovating, Ellen presumed that her builder would dispose of her "stuff" responsibly. She is an astute woman and an active political agent in other areas and has previously stated that she "would be very conscious of it ". However, she could not confirm that this waste had been disposed of properly. Several other participants also reported having thrown WEEE "in the bin", meaning the general waste. For example, Eva-Maria recently dumped a kettle and Cornelius discarded a computer via the general waste. Quite a few expressed embarrassment about their historical approach to WEEE, explaining that, at the time, it was the normal means of WEEE disposal. Most participants stated that they would tend to recycle their unwanted EEE, with the exclusion of one noteworthy category:

> Rory: Yeah. You don't assign much value to them. As I say, I put a load of them away, saying I will use that. I remember going through a bottom drawer, and it was literally full of cables. I bagged them, and I can't genuinely tell you what I did with them, other than I don't consciously remember going, "oh I must go out and put them out in the recycling" [. . .] If it [a set of headphones] was broken . . . and, I have had several because I used to always try and get good ones . . . I remember breaking a pair once and throwing them in the bin. They were broken.

> Martin: I didn't give it [sending headphones to landfill] much thought at all actually. I guess there is a difference in that I would never throw away, like a hoover, or an actual laptop, because it's big. Like those loose headphones, the tiny ones, they are like, I don't know . . .

When smaller WEEE is divested, several participants reported using the general waste bin. As a direct corollary of a prevalent lack of consciousness around small WEEE, the inclusion of peripherals or components in the WEEE category is unclear and, therefore, frequently a point of confusion. Consequently, when consumers reach this stage of the divestment process, they tend to err on the side of convenience. When Rory's collection of cables reached critical mass he decided to discard them; he has no recollection of how he achieved his goal. Rory does not "assign much value" to cables and other peripherals; thus, he disposed of them routinely, without thought. This excerpt is representative of participants' experiences and perfectly captures the consequences of the widespread lack of consciousness around very small WEEE. Martin opines that disposing of smaller WEEE via the general waste is acceptable; however, discarding larger WEEE, in the same way, is problematic. This differentiation highlights a key issue. Regularly, peripherals are first ignored as a category of stuff (existing in space without real recognition). Then, they are not identified as a category of WEEE. Finally, they are divested via the general waste.

In general, participants were at least aware of their local CA centre, with several having visited such a centre. More rurally based participants tended to visit

their local CA site regularly as they were not serviced by waste removal companies:

> Marjie: There is a big recycling area. There is a dump, or whatever else they call it, but they, it's all in different sections, and it's manned, and you just don't go in and throw your stuff anywhere you like. It's someone's job, and you pay for some stuff to be recycled, and you can, there is stuff there and they will ask you, what are you recycling today, or what are you throwing out today, you know. And that's the, so there is no charge on most of the stuff.

As a result, they were well versed in the WEEE recycling process; visiting the site was part of their established routine. For example, Marjie goes to the CA site on a bi-weekly basis and is extremely comfortable with the process. Through visiting the site she has become well informed about the whole system and her consciousness around recycling has increased, evidenced by her tendency to encourage strong recycling practices at work. Whereas Marjie finds the CA centre convenient and easy to negotiate, Mick argued that it was too far away. He did still visit and bring his WEEE there, but he thought that there should be a closer alternative.

All of the participants had some experience of the one-for-one exchange of white goods and many of them were aware of the in-store equivalent. However, few could actually recall participating in such schemes. Additionally, there seems to be a knowledge gap. Several participants disclosed not quite understanding the one-for-one scheme and the majority were completely unaware of the rule regarding small WEEE – that one can deposit small WEEE at larger stores (more than 400 m^2) without making a purchase. Ralph, who is an avid recycler, discusses his understanding of the scheme:

> Ralph: But you can bring stuff back to electrical shops, am I right? Or if you . . . I'm not sure how it works because I never really had to do it, I wouldn't be going into electrical shops all that much buying stuff. But if I was buying a new laptop I'd go in and say can I return it to you or need to bring to a recycling centre.
>
> Researcher: So you would ask?
>
> Ralph: I have a thing in my head, I know about returns and that, places like that are obliged to return it.

It is evident that he has a vague understanding of the one-for-one scheme. However, he is clearly totally unaware of the small WEEE recycling scheme. Even when the participants were conversant regarding both aspects of this programme, they still did not use the system to recycle very small WEEE and peripherals.

> James: I suppose, it's not that I don't know about being able to recycle, but when I think of recycling I don't think about the cables in the same way that I think of them, I don't think of the peripherals in the same way as I think of the electrical goods, do you know what I mean? [. . .] I have brought back items even though I wasn't going to be buying something the same day. I just called into Harvey Norman or whatever and say, "hey, you can take this can't you", and they are like, "yeah, thanks very much, there you go", and they would put it underneath the counter and I know that they are going to deal with it.

The ethnographic aspect of this research explored consumer experience around bringing WEEE to larger stores for recycling and exchanging WEEE on a one-to-one basis in convenient stores. The findings revealed the process to be confusing, embarrassing and hugely uncomfortable, deductions that are supported by the interview data:

> Laurence: I don't really buy that often. I mean I had a radio, which I disposed of recently, and besides that, this is the only other thing in the house.
>
> Researcher: Would you bring stuff back to shops?
>
> Laurence: Well actually, yeah, because they do recycle, don't they? If I thought about it, I would, but sometimes I might be dubious about whether they do or not, or just chuck it into the same bin.

Laurence expresses a lack of confidence about the rules of WEEE recycling. This excerpt is also demonstrative of the kind of scepticism that surrounds recycling schemes. Laurence's discomfort discourages him from recycling WEEE in store. Exploring consumer experience and knowledge of WEEE recycling offers an opportunity to further research recycling obstacles. These findings are presented in the following section.

6.3 WEEE Recycling Obstacles

Economic arguments submit that convenience significantly affects recycling behaviour. In fact, convenience has been described as "one of the most important non-socioeconomic determinants in whether an individual will recycle" (Wagner, 2013, p. 500). This includes the cost of the service, its proximity, the availability of kerbside collection, having accessible storage space, the time commitment and the perceived difficulty of recycling (Saphores *et al.*, 2007). Our findings support this contention:

> Kathleen: Yeah, it is actually. Yes, convenience is important. However, I wouldn't like to think that we would willfully throw things around or anything like that. But convenience is very important. Yes. It just makes everything that much easier.

Kathleen is frank: for her, convenience is "very important", and she is not alone:

> Dan: So, like it's not convenient for me anymore, because he [his uncle's electronic store] is up to the country, but like my parents now, if the toaster broke, they would bring down the old one to him and he would put it with his recycling, the electronics recycling.

> Grainne: I just don't get the time. You know, it's just one of these things, I just feel every day I'm working five days a week, and I get up, and I prepare for work, and I think about what to wear, and I go off to work and I am an hour driving down and an hour driving back, I get a walk in, eat dinner, watch a bit of telly, and I'm tired, and I get up and do the same thing. It's just even, you know, it just seems hard to . . . These things, you see, like that going to a recycling centre, or whatever, is a one-off, so when are you going to do that like, it's not going to be in your routine.

The fact that recycling WEEE is somewhat inconvenient deters some participants from regularly engaging. Dan asserts that he would not "kill" himself to recycle; however, when it is convenient (when visiting his uncle anyway), he is more than willing to deposit his broken WEEE at his uncle's electrical shop. Furthermore, the research highlights the importance of the routinisation of WEEE recycling. Grainne describes her routine and explains that going to a recycling centre is a "one-off" (rather than regular activity); hence, for her, the process is daunting. For some participants, overcoming the perception that WEEE recycling is arduous may encourage them to participate. For example, Ralph first experienced WEEE recycling with his ex-girlfriend. He had never really thought about e-waste before that encounter. He found the experience easy and rewarding and, thereafter, he participated in WEEE recycling. However, other participants will not partake in something that is outside their routine. Routines have an essential function in the everyday: they are conducted without much awareness or reflection on the part of the individual but serve to provide us with a sense of normality (Ilmonen, 2001; Casey *et al.*, 2017). This research suggests that it may be helpful to explore the routinisation of the whole WEEE recycling process, from stage 1 through to stage 4.

Recycling WEEE through retailers is dependent on consumers visiting the stores; very few participants described actually depositing small WEEE at a retailer, mainly because visiting retailers is an irregular event:

> Katherine: We probably don't buy a lot at times, but I think that one of the key factors is that, we probably don't buy, despite what we are saying tonight, we probably don't go somewhere to buy something electrical that often, you know. Electrical purchases are not a frequent purchase, so you are often not in a setting to return. So, I think that people tend to get deskilled about what they can bring in and what they can't, because they, kind of, almost forget, because it's been six months since they had been out previously or whatever. So, to me, there is something about that. I think, yeah, like for me, there is a bit more of a process of looking at it and reading the guidance online, looking it up online, and then, kind of, going, "okay, that goes there, this goes there", you know. I think we do focus on the bare pieces of equipment because they are more

obvious, rather than thinking about the smaller pieces. The smaller pieces are probably hiding in little places, or nooks and crannies around the house, in a way.

Mick: Yeah. Yeah. It is mad. I have chargers, old chargers, and you know when I am going through the press I don't even know what half of them are for now at this stage. There is nowhere really to actually. Well, where we generally bring the electronics is down to the back of Harvey Normans. They will take anything.

Ellen: I bought a steam cleaner in [name of supermarket] recently, and my one wasn't good. So I never thought to bring it with me, I thought about it afterwards that I should have, but nobody said if you have an old one you can bring it back. I would be very conscious of it, with stuff like washing machines and that, and I usually go to the same place, and they take it. But the day that I was going to buy it, I never thought of bringing that with me, and I haven't really had . . . I think I will take it back, but I hesitated when I was buying it.

Katherine reflects on this very issue: she describes the implications of this method of WEEE recycling, arguing that because of the infrequency of EEE consumption people are not as familiar with the process as they might be. This is supported by Laurence (see earlier), who stated that he would recycle at retailers if he thought of it. Ellen articulates a similar feeling; although she does not tend to consciously recycle WEEE, she does ensure that her white goods are recycled, concordant with earlier findings presented here. Both Katherine and Mick further emphasise the lack of consciousness around smaller WEEE, specifically about the recycling process. Visiting electrical retailers is not routine and therefore recycling WEEE is not routine. Even when consumers are technically knowledgeable about the process and rules of WEEE recycling, like Katherine and Mick, they flounder in practice.

There were a small number of consumers who did lack knowledge of the fundamental processes:

Eva-Maria: I don't know why I even keep the phones, to be honest, it probably is because I don't know how to throw them away. Like, I would feel bad throwing this [holding a very broken phone] into the bin.

Lexi: Oh, okay. Yeah. I have no idea. I don't even know how you would go about that. I have absolutely no clue how you would go about that.

Jennifer: I would probably bin it. What am I supposed to with it so?

Researcher: Well, you can bring it back to the shop. Like if you were to buy a new . . .

Jennifer: That's a lot of hassle, isn't it, instead of just throwing it in the bin. Going back to the shop. I don't know where the fecking kettle came from.

Researcher: Go to the shop with a kettle, when you are buying a new kettle, and giving it back.

Jennifer: Oh, when I was buying a new kettle. Oh, okay, I thought you meant like once I bought the kettle then go back to the shop.

Eva-Maria stores inoperable WEEE because she does not know what to do with it. She does know, however, that putting it in the general waste is not a positive behaviour; storage is the midway point – at least she is not actively polluting. Similarly, Lexi claims ignorance; she usually brings her broken EEE to her mother's house, where it joins her parent's collection (recall her phone in the vase). Jennifer is apathetic. Utterly oblivious to the harms associated with sending WEEE to landfill, Jennifer views disposition as satisfying. Once something is expired she disposes of it immediately and instantly "feels lighter"; thus, she tends not to store EEE or dispose of it responsibly.

WEEE posters, statutory or otherwise (consumers did not differentiate), go largely unnoticed by participants, except if they have a keen interest in waste:

James: I notice the WEEE poster displays; I think that I am the kind of person who is professionally inclined to be very aware of them. I don't know if my kids are aware of them, potentially, perhaps. Would Michelle be aware

> of them as well? Like, even about the retailers in [name of town], it is interesting the different retailers, like the [name of supermarket] WEEE poster is very prominently displayed near the tills [. . .] [name of competitor supermarket] are a standard sized [name of competitive supermarket], I couldn't tell you, they probably do have the poster up, but I don't know where it is. I can't remember where the poster in [name of another competitor supermarket] in [name of town] is either.

> Dan: I didn't see any sign about recycling, I just saw ads for TVs . . . It's not a big place. It's a family-owned place like. You know, it's not like PC [name of electronics retailer] or something like that. Then again, I was in [name of electronics retailer], and I haven't seen anything about recycling electronics. Whereas it used to be on the radio . . . " we will recycle your old electronics", and stuff like that. [Name of home ware retailer] or something.

James says that he is "professionally inclined" to notice the WEEE posters in retailers; he is actively involved in sustainable initiatives and works in a related field. James questions whether his family would notice the posters, but never draws a conclusion. However, he realises that although he can recall one poster clearly he cannot bring any others to mind. Note that the retailers mentioned by James are all retailers that are visited routinely, thus emphasising the importance of routine in the WEEE collection initiative. Dan describes a recent visit to local retailers. He cannot recall seeing any signage about WEEE collection in either of the two shops he visited; however, he can recall radio advertisements. The ethnographic element of this research sheds some light on the visibility of WEEE posters. One of the shops described by Dan was visited as part of the observations. This shop did have a sign behind the counter, above eye level – a plain A4 sheet with mid-sized lettering detailing the one-for-one scheme, in compliance with the statutory requirement. Dan failed to recall the poster because it was unremarkable; there was nothing that would draw his attention or impart information without his reading the text. Individual, text-heavy documents were often used to convey retailers' policy on WEEE collection. Chain stores tend to create a self-branded template that is displayed throughout the franchise, with some UK-based stores referencing British laws. Very often the signs were displayed approximately at eye level. However, some signs were displayed below hip level (Figure 6.1) and others were wholly obscured (Figure 6.2). Each entity adopted a unique approach – there was no unified approach to formatting or branding of the posters (Figures 6.1–6.6). This is highly problematic from a consumer branding perspective – logos, images or icons have been used for communication since prehistory, marked commodities from the fourth millennium BC have been discovered and this kind of

Figure 6.1. Retailer 1 sign location.

Figure 6.2. Retailer 5 sign location.

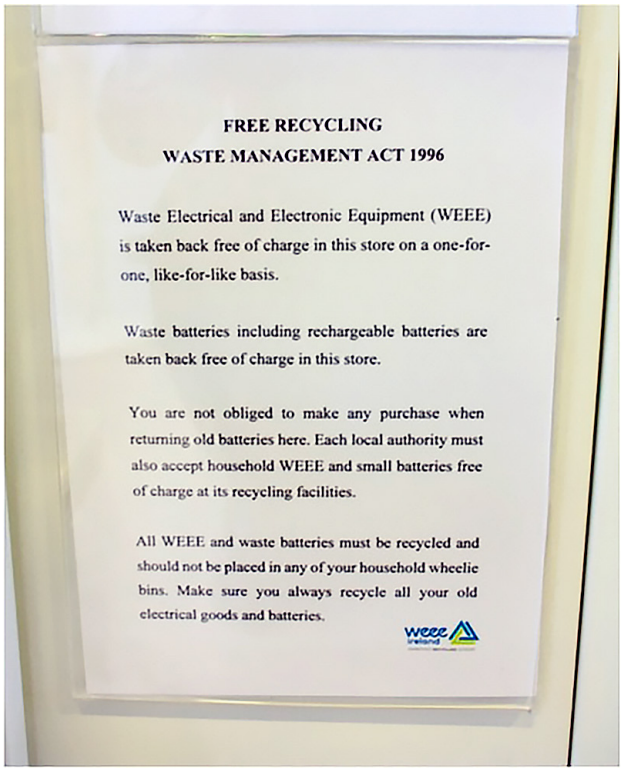

Figure 6.3. Retailer 1.

Figure 6.4. Retailer 2.

Figure 6.5. Retailer 3.

Figure 6.6. Retailer 4.

branding predates writing (Bevan and Wengrow, 2010; De Munck, 2012).

Several participants spoke about how they learned to recycle. Ralph was taught by his ex-girlfriend, Katherine learned from her housemates during a summer she spent in San Francisco as a student and Kathleen learned through experience when her recycling bins arrived. However, the most commonly reported means of learning about recycling was through school:

> Fiona: So, I don't know what age it was when I started, but yeah even I remember people coming around to us in primary school and teaching us about it, and a big pile of rubbish there and teaching us about what recycle was, what compost was, you know like breaking it down.

Additionally, parents recounted learning about recycling from their school-aged children:

> Rory: Yeah, because I would have, before, into the bin. Whereas, actually, Brendan lectured me about that once. I threw one away, and he said, “oh no, Dad, we are supposed to bring them up to school, there is a battery box up there, there is a blue box that we have in the window, and they all go in there”. I went “right, okay”.

> Mick: I think the kids are far more aware these days as well through the initiatives in the schools and so on. They are nearly coaching us, rather than the other way around. The youngest fellow is gone through a mad global warming paranoia at the moment. He is going around turning off the water, he is turning off lights, you know, the flushing of the toilet; you don’t need to flush the toilet just now. So, he has that poem, if it is yellow leave it mellow, and if it’s brown flush it down. He would also be worried looking at the news in terms of the natural disasters and stuff like that.

> Tom: I see Sky are doing a big promotion there on the plastics that are going into the sea. I do see the kids asking now. It is through school, it is definitely through school is where they are educating people about recycling. My daughter was asking me about the ozone layer and the greenhouse gases and things like that.

Green school programmes have proven successful in driving environmental attitudes in Ireland (Byrne and O’Regan, 2014), Tom, Rory and Mick all reported their children expressing an interest in environmental issues and recycling. Rory’s son chastised him for mistreating batteries, Mick’s child has embraced several environmentally friendly practices, implementing them throughout his home, and Tom’s daughter is very engaged in the environmental discourse. Although parents are the primary socialisation agents, schools and peers also play an active role. Socialisation is the lifelong process by which “people are taught the necessary skills, values, and behavioural patterns to become well-functioning members of their social group(s) and the culture in which they live” (Grønhøj and Thøgersen, 2009, p. 415). When discussing how or when they started to recycle WEEE and general waste, participants described various socialisation processes. This is a significant finding and indicates the significance of social mores.

Recent research around WEEE suggests that convenience and knowledge are both determinant factors in recycling participation. This research supports these contentions and reveals further, equally challenging impediments, a product of the complex relationship between the consumer and their disused EEE. The first issue stems from how people perceive waste. This research has demonstrated that consumers consciously store EEE, carefully curating large collections of obsolete EEE. This practice consumes both time and resources. Manifestations of this attitude include James’s decision to transport his obsolete EEE across the country, the way in which Peter shipped his ice-cream-boxed EEE to Ireland from the UK, Reuben’s meticulous assemblage of computer replaced components and finally Ben’s decision to bring his broken EEE with him when he moved house:

> Ben: I have an electronic drawer, I think my old iPod is in there my music collection, but it won’t turn on, and I think it’s a lost cause . . .
>
> Researcher: So you moved in here 4 months ago, and you brought the drawer?
>
> Ben: I brought my desk, and it was one of my drawers of my desk.
>
> Fiona: And then we just added anything that I had, maybe plugs or cables or chargers that altogether pump for the blow-up mattress.
>
> Researcher: Broken and working electronics into one?
>
> Fiona: Yes and I mean I would like to think that most of it is working, primarily working or spare chargers or extra headphones or . . . yeah . . .

This extract exemplifies how the participants approach EEE. Recent cohabitees brought their respective EEE stores to their new home (Figure 6.7) and their combined EEE is stored in transparent plastic lunch bags, clean and neat in a shared drawer. Fiona is unsure whether the contents are all working (Ben

Figure 6.7. Ben and Fiona's WEEE.

knows they are not); we are reminded of Schrödinger's cat. Participants report consciously storing EEE, despite making regular trips to the CA centre. Marjie keeps EEE for her husband, who loathes discarding potentially useful oddments and items. Kathleen fills a "chest of drawers" with computer components for her son, an amateur technophile. These stories of "stuff" illustrate that consumers are willing to pour time and effort into EEE storage – none of these accounts portray lazy consumers ignoring a problem; rather, these are active agents heavily involved with their "stuff".

The previously noted lack of consciousness around smaller EEE can result in prolonged storage, even when participants exhibit pro-environment behaviours and are fervent patrons of the recycling centre. When Kathleen is asked if she has got broken EEE in her home she replies:

> Not really. No, nothing big. I mean small things can sometimes get put in a drawer, "oh, I will get rid of that the next time I'm going to the recycling. I will take that", and it might stay there for ages.

Kathleen is committed to the recycling ethos and regularly recycles. However, despite her proclivities she tends to overlook unwanted EEE, which she has already determined to be refuse. Whether consciously stored or abandoned, EEE is likely to remain in consumers' homes far longer than necessary. If consumers were fully informed about responsible WEEE disposition and if WEEE recycling was more convenient, participation would likely increase. However, consciously stored EEE is not waste: it is stuff and would remain so; abandoned EEE would not be suddenly perceived as problematic and addressed; critical moments would not magically materialise. Fortunately, these cultural mores can be unlearned; through re-socialisation and routinisation they may be replaced by more environmentally aware, reflexive alternatives. To impel positive change in this arena, one must address the whole divestment process at every stage.

6.4 Conclusion

This chapter explored the final stage of the divestment process, including consumers' WEEE recycling habits and relevant obstacles to WEEE recycling. The findings suggest that few participants were fully informed and that they appreciate convenience; in fact, some dispose of WEEE via landfill for convenience. However, for the most part, these participants did engage in some element of the WEEE recycling process, most commonly the white goods one-for-one scheme. Consumers are somewhat confused about the like-for-like scheme, not quite grasping how it operates. Most of the participants were utterly unaware of the existence of the small WEEE retailer take-back scheme (without purchase) (for a description of the different take-back systems and programmes see sections 1.3.1 and 1.3.2). WEEE recycling knowledge and convenience influences recycling participation. Reform in both areas is necessary if WEEE recycling is to become a social norm. With regard to the divestment process, both are relevant to the final stage, the purge. Change making must take place at every stage of the divestment process and, additionally, it must be mindful of prevalent ideologies if it is to be effective.

7 Conclusions and Recommendations

7.1 Overview of Key Findings and Implications

The WEEE recycling process is often represented as a chain (see section 1.3.1); following this analogy, low WEEE recycling rates indicate a weak link in the chain, because consumers are purchasing more EEE but not recycling their current stock. This research revealed a four-stage process that reflects the life of (small) EEE after use. Each stage presents distinct opportunities to increase WEEE collection rates. The research also revealed an ideology of WEEE, which ultimately sheds further light on broader socio-cultural aspects of the consumer experience of (W)EEE.

Although policy frameworks and academic literature treat obsolete, inactive or broken EEE as WEEE, this is patently not reflected in the way that people relate to these objects. Findings indicated that participants do not distinguish EEE from WEEE, especially in the case of EEE peripherals such as cables and chargers. Additionally, they do not differentiate these from other non-electronic objects kept in drawers, sideboards and attics. Therefore, obsolete electronics cannot be treated as any other waste category. The intricate relationship between people and their possessions has been explicated by seminal consumer research exploring people's attachment to material (Belk, 1988; Belk *et al*., 1989; Kleine and Baker, 2004) as well as immaterial (Belk, 2013) possessions. Attachment to possessions is generally understood to underpin acquisition, consumption and disposition of goods, including collections, gift giving, storing and divestment, behaviours that are often ritualistic in nature (Rook, 1985; McCracken, 1986; Belk *et al*., 1988, 1989; Lastovicka and Fernandez, 2005). This is not different from WEEE-related behaviours. What is particularly interesting about small WEEE is that, unlike other, more definitively valued possessions, it exists in less visible and more fluid states. It's existence is patent, but somehow it simultaneously exists in the periphery of consciousness, "lying somewhere in the house", on shelves and in drawers, as most participants pointed out.

Importantly, people generally store obsolete electronics because of this complex relationship and shifting meanings that these objects take on within the home, rather than because of inaction or lack of information regarding recycling facilities. It is therefore precisely this in-between state, being neither "trash" nor "treasure", where opportunities for interventions to increase proper reuse and recycling of these products exist. For example, policy interventions can tap into the perceived use potential of WEEE to drive appropriate reuse. However, significant objects with strong emotional attachment present less of an opportunity, but also less of a challenge, as they tend to be single objects and therefore do not constitute the bulk of the stored devices. Technology has changed the way that we live; ubiquitous, it creates new ways to learn, work, socialise and play. Consumer value is dependent on how efficiently it operates. Once broken or obsolete, technology quickly loses or reduces in value; how consumers view that leakage – the perceived value (see Chapters 4 and 5) – determines the next step (see Chapter 6).

7.1.1 Hoarded WEEE: an ideological framework

This research explored how consumers experience WEEE disposition, focusing not only on the process but also on the ideological positions that inform this process. Ideology can be understood as:

> Basic frameworks of social cognition, shared by members of social groups, constituted by relevant selections of sociocultural values and organised by an ideological schema that represents the self-definition of a group. Besides their social function of sustaining the interests of groups, ideologies have the cognitive function of organising the social representations (attitudes, knowledge) of the group, and thus indirectly monitor the group-related social practices (van Dijk, 1995, p. 248).

Ideology shapes our understanding of the world, our behaviours, our attitudes and even knowledge. Although the divestment process depicted here describes how WEEE is treated by consumers, an explicative ideological framework serves as a lens,

revealing the foundational sociocultural norms and assumptions that underpin this treatment. Findings indicate that WEEE is embedded in an ideology of frugality, altruism and cleanliness, with each element of this ideological framework impacting how consumers treat WEEE differently.

Consumers tend to be frugal with their EEE possessions. Frugality, "is characterized by both restraint in acquiring possessions and resourcefulness in using them" (Pepper *et al*., 2009, p. 133) and should be applauded (Pepper *et al*., 2009; Evans, 2011). Consumers store EEE for extended periods based on a belief that because the items are (almost) operational they hold some use potential, either in whole or in part. Consumer reluctance to discard potentially useful EEE is both commendable and sensible, only becoming problematic when large volumes of obsolete and broken EEE are stored for prolonged periods. This is an issue that is compounded by consumers' inclination to view discarding EEE, even partially operational and sometimes wholly defective EEE, as wasteful, regardless of whether it is likely to be used again. Thus, although frugality should be lauded, false frugality – storing broken or obsolete EEE – is massively problematic for WEEE collection and offers no real benefit to the consumer.

The second ideological position that underlies EEE storage is altruism. Altruism is key to social integration; it is considered to be the foundation of human friendship and is at the heart of kinship (Brañas-Garza *et al*., 2010; Curry *et al*., 2013). Kin altruism is especially prevalent and features heavily in this research; EEE moves readily through family networks, often passing through several members of an extended family. Again, this is unproblematic until EEE is stored indefinitely for the potential use by another.

Finally, how cleanliness, or perhaps, more precisely, how dirt, is construed is hugely instrumental in how consumers treat WEEE. The European understanding of defilement pertains to hygiene and aesthetics, pathogens and disease. Whereas contaminants or contagions are *naturally* defined by their visible state of cleanliness, WEEE will never be perceived as odious and storing EEE will be an innocuous practice. This argument was illustrated by its antithesis: when WEEE was discarded in nature it became dirt; cleanliness had to be restored regardless of the larger consequences. Conversely, the EEE in our homes is perceived to be clean and therefore requires no action. Additionally, dirt is objectionable because it offends order; it is understood that "dirt is the by-product of a systematic ordering and classification of matter, in so far as, ordering involves rejecting inappropriate elements" (Douglas, 1966, p. 36). Thus, when WEEE fails to offend order, when it lurks in drawers with Christmas cards and lockless keys, it occupies an ill-defined space between trash and treasure: inoffensive, yet unwanted. Thus, it can be argued that the consumer WEEE divestment process is embedded in an ideology of frugality, altruism and cleanliness, which underpins the actions and inactions that determine WEEE's fate.

7.1.2 The WEEE divestment process

- **Stage 1e – inactive WEEE**: Disused or broken EEE kept in the home falls into two categories: that which is actively and consciously stored and that which falls into disuse or is replaced and is then abandoned. Findings indicated that disused EEE, which is valued from either an emotional or a utilitarian perspective, tends to be carefully curated by the participants. Over time, even the actively stored equipment is forgotten as its value dissipates. The second category, abandoned EEE, easily fades into the household landscape and is overlooked; this kind of EEE is not consciously "stored". Additionally, because abandoned EEE is not valued, it is rarely the subject of debate or deliberate decision making. Thus, all disused EEE is not equal; recovery must be approached from very different perspectives. Second, with regard to both abandoned and stored EEE, consumers think of these objects as "stuff" and do not necessarily deem either category (stored or abandoned) waste. Additionally, consumers tend to overlook peripherals completely. Policy efforts to categorise used or broken EEE as waste are thwarted by the very nature of the material: clean, inoffensive and somewhat valuable. Thus, consumers tend to ignore or store WEEE until doing so becomes more troublesome than recycling or discarding it. Given this finding, it is clear that the categorisation of disused or even broken EEE as "waste" is problematic. This dissonance between the policy's interpretation of this material and that of the consumer is problematic from a practical perspective: when policymakers and other market actors speak of "WEEE" or "e-waste" consumers

do not recognise disused or broken EEE in their homes. Were WEEE recognised as waste, it would be treated very differently: removed from the public and the private gaze to restore order to that environment (Douglas, 1966; de Coverly *et al.*, 2008).

- **Stage 2 – the critical moment**: Several participants described circumstances in which they had or would have a clear-out. These clear-outs tended to target specific spaces rather than categories of waste. Moving, renovation, death and institutionalisation were all described by participants as events that would prompt divestment. Disruptive events, such as those described, interrupt the "ontological security" that orders social life. Ontological security is the established framework, or regime of truth, that guides routine behaviour (Giddens, 1991; Cherrier and Murray, 2007). In these cases, the disruptive events forced confrontation with one's stored or hoarded possessions, and reflection, and, consequently, the participants were propelled towards divestment. In addition, participants reported disposing of WEEE once a "critical mass" was reached; this divestment behaviour could be termed an "injunction" – "a social construction (historical, family-based, personal) which has produced the framework of assumptions triggering the action – the thing that simply has to be done" (Kaufman, 1998, p. 8). These are the kinds of prompts that get people to do chores – to clean their homes or wash their hair. Finally, participants also reported divesting of discrete categories at the request of both charitable and commercial entities. Whether a disruptive event, an injunction or a request, these "critical moments" triggered critical reflexivity around the stored (W)EEE and participants were impelled to collect abandoned WEEE and re-evaluate stored EEE based on more current criteria. Interestingly, the final category of critical moment, which was externally instigated, demonstrates that critical moments can be purposefully prompted. Critical moments are vital to the divestment of both consciously stored and abandoned EEE.
- **Stage 3 – categorisation**: Once the consumer has experienced a critical moment, he/she must begin to critically evaluate his/her possessions. Again, this decision is based on use potential or some form of attachment, and is entirely subjective. It should be noted that individual items can be summarily propelled to this point on occasion of their breaking (take, for instance, Peter's phone, the fate and state of which he is still pondering); however, in this case the WEEE is often abandoned, as the consumer is unsure how to dispose of it or is unmoved to dispose of it. Participants were reluctant to partake in this stage of the divestment process; this is the first stage, which is wilfully postponed. Once EEE becomes WEEE it must be disposed of; it is impure, pollution and therefore dangerous (Douglas, 1966, 1968).
- **Stage 4 – disposal**: Following a critical moment and categorisation of their hoarded possessions, participants were often prompted to dispose of their WEEE. Chapter 6 addressed what we termed the "purge", that is, the divestment of consumer WEEE, either through appropriate recycling facilities or through other routes. In doing so, participant knowledge and experience of the WEEE recycling process was explored, focusing on the primary obstacles to WEEE recycling. Findings indicated that participants are relatively well informed about the broader recycling infrastructure, with the notable exception of the policy around small WEEE take-back to larger retailers. Additionally, even when consumers were aware of the policies they were somewhat sceptical about the process; they were unsure whether or not the stores would take back their WEEE.

7.1.3 Factors influencing WEEE divestment

All of the participants were aware of the white goods like-for-like exchange and were extremely comfortable with it. However, participants' knowledge around the small WEEE like-for-like scheme was less acute and very few participants knew that they could simply deposit small WEEE at larger retailers. This lack of clarity contributed to a sense of discomfort around retailer WEEE collection (of small WEEE) and discouraged participation, even in the like-for-like scheme. Consumers frequently reported failing to notice any in-store information posters, legal, promotional or otherwise. The incoherence and invisibility of the in-store posters, further highlighted by the observational element of this research,

underscored the discomfort and uncertainty of this process.

Some participants described their exposure to recycling in a social context – via housemates, girlfriends or school activities or through their children. For instance, some participants specifically mentioned the impact of the WEEE Ireland/LauraLynn battery recycling campaign on their battery recycling habits. This campaign collected 812 tonnes of waste batteries in 2016 (equivalent to 32 million AA batteries) (LauraLynn, 2017). Several participants in their twenties recollected learning how to recycle at school, recounting distinct memories of visiting educators explaining the importance of recycling and how various wastes are recycled. These participants could also recall encouraging their parents to recycle after this. Social pressures or normative influences can influence attitudes or behaviours by redefinition of socially acceptable behaviours (Byrne and O'Regan, 2014).

Lack of convenience is associated with consumers' failure to recycle. Convenience is defined as "the distance to a recycling station, the amount of space available to store recyclables, the ratio of collection bins to households or certain housing characteristics" (DiGiacomo *et al.*, 2018, p. 310). Research indicates that consumers respond positively to an increase in convenience (Bouvier and Wagner, 2011; DiGiacomo *et al.*, 2018), when barriers such as a "lack of or restricted access to a conveniently located facility, costs associated with transportation, the opportunity cost of time needed, and fees charged" are overcome (Bouvier and Wagner, 2011, p. 1053). This research supports the contention that convenience is an important factor in WEEE recycling, but recognises that it is only one aspect of a multidimensional issue. Additionally, it is argued that consumers view "convenience" in the context of their daily lives somewhat differently from how it is represented in the literature. When the participants discussed convenience they described routine, or lack thereof – the irregularity of the whole recycling process. Routine and WEEE recycling are doubly entwined and must first be untangled. The first challenge arises around the fact that EEE does not break very often, nor is it often replaced. Small and clean WEEE is easily avoided or ignored; thus, when consumers do encounter small WEEE they falter. Without any specific routine to guide them the WEEE is stored or abandoned until a critical moment brings it to the fore. Second, when WEEE has been identified and collected it often remains in the home. Participants reported storing WEEE or disposing of it incorrectly because electrical retailers and CA sites are not part of their routine. Given these conditions, participants have not constructed a set of habits or routines around WEEE. Habits and routines are important because:

> Habits are the relatively automatic things a person thinks or does repeatedly. Routines, in contrast, are a type of higher-order habit that involves sequencing and combining processes, procedures, steps, or occupations. Routines specify what a person will do and in what order and therefore constitute a mechanism for achieving given outcomes and an orderly life (Clark, 2000, p. 128S).

The home is a "web of routines, silent agreements, and ingrained reflexes" (Ehn and Löfgren, 2010, p. 82). Routines order social life. They provide stability, predictability and control; often invisible, they are naturalised until reflected on as "cultural stuff" (Wilk, 2009). Establishing routines "is vital for humans to operate effectively" (Shilling, 2008, p. 12). Assimilating tasks, skills and objects into the everyday is a fundamental process in life. Through repetition certain actions can become habits, which expedite everyday routines, simplifying activities that would have otherwise taken conscious consideration (Ehn and Löfgren, 2010). Habits and routines are encoded in material culture, in the household and workplace landscape, and in social norms or codes (Wilk, 2009). Essentially, habits and routines enhance the everyday; tasks can be achieved with very little conscious thought or energy and are thus considered easy. Importantly, routines and habits are built around materiality, that is, they are what people do with things (and other people). They enable social life and, yet, are almost invisible. The connection between WEEE recycling and routine is visible at every stage of the divestment process: participants described habitually abandoning WEEE, routinely ignoring it until they encounter a critical moment, habitually storing obsolete EEE and overlooking unwanted EEE because disposing of it takes them out of their routine, an eventuality that is, naturally, troubling. These instances represent opportunities to increase WEEE recycling participation.

Not surprisingly, participants do not think of their possessions in terms of EEE/WEEE categories. Consumer behaviour around EEE has proven to be complicated and nuanced. Recall Ben's inoperative iPod (section 6.4), Nerea's incapacitated laptop (section 4.3.2) or Laurence's collection of faulty phones (section 4.3.1) – the evidence indicated that consumers do not automatically perceive defective EEE as waste (thus, it remains in their home as "stuff"). This applies even when the participants regularly visit the CA site – both Kathleen and Marjie consciously stored inoperative EEE (for family members) despite frequent visits to the CA site (sections 6.3 and 6.4). Additionally, participants were attentive to stored EEE; see, for example, Peter's assortment of obsolete and disused EEE, which survived a critical moment (his decision to move) and was then shipped to Ireland from the UK (section 4.3.1), or James's displaced EEE, which he drove across Ireland to his relative's spacious home, on the off-chance that his brother-in-law should want it (section 4.3.1). These examples underscore the role of EEE in social and economic life. EEE is not simply discarded; it is valued and treated with some deference and thus it would seem that the theory that consumers store EEE because disposing of it is inconvenient is problematic. Additionally, disused or unwanted small EEE components and peripherals are often absorbed by the domestic landscape, rendering them practically invisible. Given this and the social neutrality of WEEE storage, it is argued that, although a more convenient process would temporarily increase WEEE recovery, it would not hasten the progression of EEE to WEEE or encourage reflexivity around WEEE storage. To succeed, strategic decisions should consider the whole divestment process and its ideological underpinning.

7.2 Recommendations

This research highlights the importance of a multi-pronged approach that addresses each step of the divestment process and the relevant ideological context. Accordingly, three levels of recommendations are proposed (Table 7.1). First, short-term recommendations involve simple interventions to augment the visibility and accessibility of WEEE recycling that can be realised in the immediate term (and up to 3 years). Second, medium-term recommendations will require more time but address the tangible issues of communication and trust building. Finally, long-term recommendations address the ideological context and cultural values underpinning WEEE recycling and require continuing efforts for broader socio-economic and cultural transformations regarding the use and disposal of EEE/WEEE. These would, therefore, require extensive efforts and time to implement.

7.2.1 Short term: visibility and accessibility

Short-term recommendations include those that could be implemented within 3 years. However, some of the suggestions outlined here could be executed within a year. For example, the development of a clear badge or symbol denoting which retail outlets are part of the like-for-like scheme and which participate in the broader small WEEE collection scheme could be implemented in a relatively short period of time. Short-term interventions target specifically the enhancement of the visibility and accessibility of the WEEE recycling process.

- Augmenting the WEEE recycling brand: Participants who had visited CA sites described the process as easy and stated that they would engage with the WEEE recycling process again; consumers who have recycled their WEEE once may be more likely to do so again if they have a positive experience. The auto-ethnographic account offered further insights about the WEEE take-back experience: this was often uncomfortable and somewhat confusing. One way to decrease this discomfort and enhance the visibility of the WEEE recycling process would be the augmentation of the WEEE recycling brand. Corporate brands are not merely logos; they convey organisational identity, meanings and ideals and are sources of trustworthy information about who is providing what service, how well and to what end (Balmer, 2008). For this kind of approach to succeed consideration needs to be given to precisely what is being offered and what meanings should be associated with this brand, that is, what is the "brand message". Consumers must be fully confident that the collection point in question is the correct place to engage in this behaviour (take-back) and that the service is free of charge. A badge or symbol, described above, in conjunction with a rudimentary information

Table 7.1. Recommendations

Recommendation level	Description	Most relevant stakeholder(s)
Short term: visibility and accessibility	*Augmenting the WEEE recycling brand* Develop a single, consistent and identifiable WEEE recycling brand to be clearly displayed at all relevant collection and take-back points	Compliance schemes, retailers and the EPA
	Enhancing reflexivity Provide households with WEEE recycling tools, e.g. distribute a box, some clear WEEE recycling instructions and a list of local WEEE recycling collection points (including large shops) to households	Compliance schemes and the EPA
	Routinisation of WEEE recycling Further develop convenient collection infrastructures, including a bring-point system	Compliance schemes and the EPA
Medium term: communication and transparency	*Speaking consumers' language* All communication must be written and presented in a way that is cognisant of consumers' (rather than policymakers') understanding of WEEE. Consumers see possessions, not waste	Compliance schemes (to act as a bridge between consumers and policymakers)
	Increasing transparency Increase awareness of the WEEE recycling process and outcomes. Instrumental in this is the development of the WEEE recycling trusted brand	Compliance schemes and the EPA
	Facilitating data storage/erasure Cloud storage and data erasing facilities are possible avenues	Compliance schemes, producers and the EPA
	Harnessing the role of education Through school programmes that encourage WEEE awareness and recycling	Compliance schemes (in collaboration with schools and universities)
	Addressing incidental WEEE arising Collection of WEEE arising through household waste collection	Compliance schemes, household waste collectors and the EPA
Long term: economic, social and cultural transformation	*Challenging embedded ideologies* For example, market-facing social movements such as Zero Waste can play a critical role in transforming marketplace ideologies and practices *Transitioning towards a circular economy*	These are macro-level changes that are not within the remit of any single stakeholder. However, individual stakeholders' short-term interventions can effect or at least contribute to socio-technical changes. For example, increasing the number of collection points and working with a social movement can contribute to the routinisation of WEEE recycling, which can further lead to transformed attitudes towards WEE

campaign (a coherent series of in-store A0-sized adverts) would serve to instil consumer confidence and increase participation. A strong identifiable WEEE recycling brand could also be a point of coalescence for the scheme participants. To ensure consumer recognition, it is essential that the same semiotic resources are used throughout. An additional icon, indicating which companies take back small WEEE without purchase, should also be developed. This idea could be expanded on: the same symbolic repertoire could be drawn on to create a downstream labelling campaign in which producers, in co-operation with other stakeholders, incorporate the same icon into their labelling, suggesting that where this icon is present consumers can be confident that both a particular piece of EEE (at the end of life) and other similar products will be accepted. This approach would have the added benefit that consumers very often trust the brands that they purchase (Fournier, 1998); thus, some of that trust may be redirected to the recycling scheme.

- Enhancing reflexivity: This research spoke to the importance of routine, a lack of consciousness

around small WEEE and a tendency to store as a reaction to uncertainty. Currently, waste collection agencies distribute general recycling information and aids or equipment. The inclusion of WEEE recycling tools in the general recycling resources or aids could help address several aspects of the WEEE storage issue. Findings indicate that an external influence can trigger a "critical moment" and this critical moment pre-empts a "purge". Specifically, a designated box for small WEEE could be distributed to each member of a household, which consumers could use specifically for their electronics, as well as a brochure with guidelines about small WEEE recycling and local collection points, events and dates. The box should display a label with pictures of the acceptable devices and a label with triggers for recycling, taking into consideration consumers' habits such as spring cleaning. If such a box, guidelines and triggers were distributed to consumers, it could act as a stimulus that may trigger a "critical moment". During a purge, consumers collect and appraise their abandoned EEE to determine whether it should be retired (to storage) or discarded. The aggregation of all of the abandoned EEE in an average house would likely amount to a "critical mass", enough to justify a trip to the local WEEE recycling point. Consumers may also take the opportunity to critically re-evaluate their stored EEE. Additionally, a "place" specifically for WEEE might help consumers to categorise EEE as WEEE earlier. Furthermore, WEEE recycling is an irregular activity; findings indicated that some participants found the prospect daunting, as it was not included in their routine. A set of WEEE recycling resources would be a centrepiece around which a clear recycling routine could be established – consumers would know precisely what to do with their WEEE. Reflexive tactics such as this have been successfully employed elsewhere and have proven quite useful in addressing the routinisation of ideologically embedded behaviours (Casey *et al*., 2017).

- Routinisation of WEEE recycling: Currently, the WEEE in-store collection points are numerous. However, consumers visit these stores infrequently, depending on their purchasing needs. When convenience is understood in terms of routine, existent collection points are perceived by some consumers as inconvenient. Establishing collection points at locations that are routinely visited by consumers (supermarkets, schools, libraries, shopping centres) would likely increase collection point visibility and participation. Convenient infrastructures and knowledgeable consumers are both essential to the WEEE collection process, and these kinds of infrastructural changes can help to overcome obstacles to consciousness and knowledge. Making WEEE recycling increasingly part of consumers' routine visits will hopefully increase awareness of WEEE recycling; through repetition, novelty becomes routine. Recent research around WEEE suggests that convenience and knowledge are both determinant factors in recycling participation (Schultz, 2014; Bovea *et al.*, 2018). This research supports these contentions, acknowledging that convenience and a lack of knowledge are both significant factors but also advancing the notion that there are other, equally challenging impediments. There is clear evidence that reducing the physical demands and uncertainty around a behaviour encourages positive change in that behaviour (Schultz, 2014) and the creation of convenient and accessible WEEE collection points, embedded in consumer routines (at a supermarket, library or alternative regularly visited locales), coupled with increased consumer knowledge could increase WEEE collection rates and are a necessary improvement. Indeed, the most successful WEEE recycling scheme (the Swedish El-Kretsen system) relies on a dense and convenient collection infrastructure (Gorecki, 2014). In the context of a different waste stream, bottle banks have been highly effective in collecting the majority of glass waste in the EU (Seyring *et al*., 2015).

7.2.2 Medium term: communication and transparency

These recommendations will typically require 3–5 years to implement and address issues that relate to communication and trust.

- Speaking consumers' language: The language currently employed by policymakers around WEEE is not harmonious with how consumers perceive both the material itself (waste) and

how they interact with it (store). Consumers tend to view unused EEE as "stuff" or "things"; although they actively store some EEE they tend to either abandon or dispose of that which they have determined as waste. This is a significant communication barrier. This finding has both methodological and practical implications. Methodologically, if researchers continue to discuss WEEE, they need to be cognisant of the fact that consumers do not recognise their "stuff" as WEEE. This also applies to policy; to access the "EEE in-between", the abandoned WEEE and the stored EEE, policymakers need to amend how they describe and approach all three categories. Policy should attempt to encourage reflexivity and the adoption of reflexive divestment activities around obsolete and broken EEE storage; "reflexivity is intentional and reflexive activities are intended to address problematic practices" (Casey *et al*., 2017, pp. 228–229). Service branding around WEEE collection should also be aware of these inconsistencies; to reach consumers, organisations need to speak in their language.

- Increasing transparency: Given the nature of the WEEE recycling industry, consumer discretion arises only in whether WEEE is recycled, sent to a landfill or stored indefinitely. Thus far, this research has explored this process in detail; in the previous section the development of a strong communicative brand has been proffered as an immediate solution to informational deficiencies. However, brands are not merely forms of communication. A strong, credible brand instils confidence and trust and encourages engagement (Kemp and Bui, 2011; Hollebeek, 2013). Participants reported scepticism around recycling in general and the WEEE recycling process itself: what becomes of their waste? Is it shipped to Africa? Is it reused or recycled? How is it recycled? What does it become? They also expressed concerns about data protection: is their data vulnerable to thievery? Is it deleted properly? Thus, consumers need to trust the organisations that handle the EEE waste stream, with trust conceptualised as "a willingness to rely on an exchange partner in whom one has confidence" (Morgan and Hunt, 1994, p. 23). Trust emerges from a belief that the firm in question is "reliable and has high integrity" (Morgan and Hunt, 1994, p. 23). Participants were uninformed about the whole WEEE recycling process and could not, therefore, describe what happened to their WEEE or who was responsible for its collection. It is suggested that an integrated WEEE recycling brand identity be developed for use in the general market, that this brand represents the whole process and becomes a trusted symbol that instils confidence in the consumer – one brand that incorporates environmental and pro-social values, transparency, integrity and trust.
- Facilitating data storage or erasure: The WEEE divestment process described in the results chapters explored why consumers stored obsolete and broken EEE. Although, some participants described an emotional attachment to singular objects, most participants were attached to the content of the devices; in this case, the devices became vessels capable of keeping memories and documents "safe" yet available, should there be a need to draw on this resource. By contrast, some participants perceived the data stored on these devices as a liability. For example, some participants referenced a documentary that had uncovered criminal activity concerning the improper use of private data retrieved from discarded laptops, indicating scepticism and mistrust about how WEEE is treated by collection agencies and its security after disposal and a general mistrust in the recycling system. Introduction of the General Data Protection Regulation (GDPR) (EU) 2016/679, implemented on 25 May 2018, may further increase awareness of data privacy and security issues. Our findings around data and EEE have several implications. When consumers store WEEE as a vessel, their connection is with the contents of the vessel; this means that the object itself is nigh on irrelevant. However, while storing WEEE is still socially acceptable, these consumers are unlikely to divest of these vessels. The second group of consumers, those who wish to protect their personal data, have a similar relationship with their unwanted EEE. In many cases, an item has been replaced and has fallen out of use completely; the item's only value is its location. Both categories are distinguished by a depreciated consumer/artefact relationship. Practically, a similar approach may address both issues. Consumers may be willing to partake in a data transfer service offered in exchange for their old phones/laptops. As cloud

storage becomes ubiquitous, this type of WEEE storage may decrease as consumers store their contacts, photos, music and private documents in the cloud. Data protection concerns can be addressed via the distribution of "kill discs", via access to a gratuitous internet version of this type of software or through the creation of booths or stalls that help consumers transfer data to their new hardware or to a cloud in return for the retired phone/laptop. This would involve some infrastructural changes. However, it would encourage trust and confidence in the WEEE recycling brand.

- Harnessing the role of education: To change social norms that favour storage of WEEE, it is vital to educate young children on the negative consequences of WEEE storage. This is in line with existing campaigns currently implemented by the Irish compliance schemes (LauraLynn battery campaign and "Batteries for Barretstown"). Norms represent values – "values reflect culture when they are widely and strongly held" (Morgan and Hunt, 1994, p. 25). Tackling this social norm should begin in schools. This research has drawn attention to the various attributes of WEEE that have resulted in the social acceptability of its storage. While consumers perceive WEEE storage as innocuous, achieving consistently high collection rates will be challenging. A school challenge mirroring the LauraLynn or Barretstown battery campaign would teach both parents and children about the merits and perils of WEEE recycling and may instigate a "critical moment", resulting in disposition. Our research indicates that triggers that focus on discrete categories of WEEE, such as discarded mobile phones, have been successful in prompting critical moments. This is a significant finding, the implication being that campaigns directed at particular categories of WEEE, such as mobile phones, could be successful.
- Addressing incidental WEEE arising: Almost every participant in the study admitted occasionally throwing small WEEE into his or her household bin. Although it is not legal to collect this type of waste through household waste collection systems, because of serious safety and environmental concerns, the fact remains that people do dispose of WEEE in this way. It is therefore useful to examine how best to retrieve from waste collectors the WEEE incidentally arising in their waste loads. More research is needed to address this issue and the ways to tackle it. For example, waste categorisation studies can give an indication of the amount of WEEE disposed of in this way.

7.2.3 Long term: economic, social and cultural transformation

Long-term change requires substantial transformations of current EEE-related practices, both socio-cultural change and socio-economic change. Although no individual WEEE-related stakeholder can generate these changes, the role of social movements and technological advancements can inform policymakers wishing to engender such macro-level transformations.

- Challenging embedded ideologies: Addressing inconvenience, knowledge and awareness is a useful approach; however, it fails to confront the ideological underpinning of WEEE in the everyday. Frugality, altruism and cleanliness are social norms; they form the culture of WEEE. Challenging embedded ideologies is a difficult task. Holt (2012, p. 242) argues that "unsustainable consumption [and disposition] is often caused by the development of market ideologies that have become naturalised within specific market institutions and consumer practices", a phenomenon that he refers to as ideological lock-in. Holt's concept can be applied to the set of naturalised practices (conscious storage/abandonment) and social norms (frugality, altruism and cleanliness) in which WEEE is embedded. Unsustainable behaviours need to be addressed individually because they are rooted in different ideological positions and must therefore be approached accordingly; "whether a market has a potent ethical component depends largely on the efforts of social movements and subcultures, embedded within the market, that challenge the dominant market construction. These ethical challenges are tailored to the specific ethical 'problems' of the marketplace" (Holt, 2012, p. 243). Historically, social movements have produced significant cultural change across a broad range of issues (slavery, women's suffrage, racial equality and environmental protection) (Hiatt *et al*., 2009). Social movements

have also directly impacted the marketplace; the emergence of the co-operative movement and developmental associations and the thrift and insurance industries were all responses to various social movements (King and Pearce, 2010). Although it may be tempting to focus on the machinations of institutions, these changes need to take place in the everyday; unquestioned definitions of reality need reassessment (Hiatt *et al*., 2009) and this kind of fundamental change is the purview of social movements. Holt (2012, p. 255) advises that policymakers work with effective market-facing social movements to transform specific market ideologies, institutions and practices (as opposed to the ideology of consumerism) via tailored strategic plans aimed at the "market's most vulnerable 'lock-in' features". This presents an alternative strategy involving consultation with and the support of relevant social movements and other market actors to leapfrog some of the barriers to WEEE recycling. Our findings suggest that in the mind of the consumer there is a disconnect between WEEE storage and environmental degradation. This is an assumption made even by environmentally active consumers and those who are technically informed. Thus, this assumption is not based on the availability of information; instead, it is embedded in the cultural norms mentioned above. The waste industry is home to several relevant social movements capable of reshaping cultural norms. For example, the Zero Waste movement is a growing movement that relies on user-generated content to effectively convey waste-related messages; a recently shared video has been viewed 203,000 times. Working with such a movement is an economical (members tend to work for very little or nothing, motivated by ideology) and potentially far-reaching option.

- Transitioning towards a circular economy: Increasing technological innovation and accelerated economic activity have resulted in the shrinking of spatial barriers and distances. On the one hand, this has resulted in conditions of hyperproduction and consumption, with increased electronics consumption and reduced electronics lifespan leading to burgeoning WEEE. On the other hand, the internet age has given rise to new models of production and consumption, known as the "sharing economy" and "collaborative consumption" (Belk, 2010, 2014). Growing in popularity, these new models of business and consumption require a shift towards forms of possession and use that do not involve ownership. They thus offer opportunities in the transition towards a circular economy, which require ambitious and far-sighted decisions at institutional levels. For example, in January 2018 the EU adopted a new set of measures towards the implementation of the Circular Economy Action Plan, targeting plastics production, use and recycling; marine pollution; the relationship between waste, product and chemicals; key indicators of a circular economy at EU and national levels; and critical raw materials. The implementation of a circular economy opens up many different areas where further research is needed both at macro-institutional levels and at micro levels of local experiences to identify contingencies that will enable transitioning to a sustainable society.

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Abbreviations

ARF	Advanced recycling fee
CA	Civic amenity
CE	Circular economy
EEE	Electrical and electronic equipment
EPA	Environmental Protection Agency
EPR	Extended producer responsibility
ERP	European Recycling Platform
EU	European Union
ICT	Information and communication technology
IT	Information technology
POM	Placed on the market
PRL	Producer Register Limited
PRO	Producer responsibility organisation
RoHS	Restriction of Hazardous Substances
vEMC	Visible environmental management cost
WEEE	Waste Electrical and Electronic Equipment

AN GHNÍOMHAIREACHT UM CHAOMHNÚ COMHSHAOIL
Tá an Ghníomhaireacht um Chaomhnú Comhshaoil (GCC) freagrach as an gcomhshaol a chaomhnú agus a fheabhsú mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ó éifeachtaí díobhálacha na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialú: *Déanaimid córais éifeachtacha rialaithe agus comhlíonta comhshaoil a chur i bhfeidhm chun torthaí maithe comhshaoil a sholáthar agus chun díriú orthu siúd nach gcloíonn leis na córais sin.*

Eolas: *Soláthraímid sonraí, faisnéis agus measúnú comhshaoil atá ar ardchaighdeán, spriocdhírithe agus tráthúil chun bonn eolais a chur faoin gcinnteoireacht ar gach leibhéal.*

Tacaíocht: *Bímid ag saothrú i gcomhar le grúpaí eile chun tacú le comhshaol atá glan, táirgiúil agus cosanta go maith, agus le hiompar a chuirfidh le comhshaol inbhuanaithe.*

Ár bhFreagrachtaí

Ceadúnú
Déanaimid na gníomhaíochtaí seo a leanas a rialú ionas nach ndéanann siad dochar do shláinte an phobail ná don chomhshaol:
- saoráidí dramhaíola *(m.sh. láithreáin líonta talún, loisceoirí, stáisiúin aistrithe dramhaíola)*;
- gníomhaíochtaí tionsclaíocha ar scála mór *(m.sh. déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta)*;
- an diantalmhaíocht *(m.sh. muca, éanlaith)*;
- úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe *(OGM)*;
- foinsí radaíochta ianúcháin *(m.sh. trealamh x-gha agus radaiteiripe, foinsí tionsclaíocha)*;
- áiseanna móra stórála peitril;
- scardadh dramhuisce;
- gníomhaíochtaí dumpála ar farraige.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil
- Clár náisiúnta iniúchtaí agus cigireachtaí a dhéanamh gach bliain ar shaoráidí a bhfuil ceadúnas ón nGníomhaireacht acu.
- Maoirseacht a dhéanamh ar fhreagrachtaí cosanta comhshaoil na n-údarás áitiúil.
- Caighdeán an uisce óil, arna sholáthar ag soláthraithe uisce phoiblí, a mhaoirsiú.
- Obair le húdaráis áitiúla agus le gníomhaireachtaí eile chun dul i ngleic le coireanna comhshaoil trí chomhordú a dhéanamh ar líonra forfheidhmiúcháin náisiúnta, trí dhíriú ar chiontóirí, agus trí mhaoirsiú a dhéanamh ar leasúchán.
- Cur i bhfeidhm rialachán ar nós na Rialachán um Dhramhthrealamh Leictreach agus Leictreonach (DTLL), um Shrian ar Shubstaintí Guaiseacha agus na Rialachán um rialú ar shubstaintí a ídíonn an ciseal ózóin.
- An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Uisce
- Monatóireacht agus tuairisciú a dhéanamh ar cháilíocht aibhneacha, lochanna, uiscí idirchriosacha agus cósta na hÉireann, agus screamhuiscí; leibhéil uisce agus sruthanna aibhneacha a thomhas.
- Comhordú náisiúnta agus maoirsiú a dhéanamh ar an gCreat-Treoir Uisce.
- Monatóireacht agus tuairisciú a dhéanamh ar Cháilíocht an Uisce Snámha.

Monatóireacht, Anailís agus Tuairisciú ar an gComhshaol
- Monatóireacht a dhéanamh ar cháilíocht an aeir agus Treoir an AE maidir le hAer Glan don Eoraip (CAFÉ) a chur chun feidhme.
- Tuairisciú neamhspleách le cabhrú le cinnteoireacht an rialtais náisiúnta agus na n-údarás áitiúil *(m.sh. tuairisciú tréimhsiúil ar staid Chomhshaol na hÉireann agus Tuarascálacha ar Tháscairí)*.

Rialú Astaíochtaí na nGás Ceaptha Teasa in Éirinn
- Fardail agus réamh-mheastacháin na hÉireann maidir le gáis cheaptha teasa a ullmhú.
- An Treoir maidir le Trádáil Astaíochtaí a chur chun feidhme i gcomhair breis agus 100 de na táirgeoirí dé-ocsaíde carbóin is mó in Éirinn.

Taighde agus Forbairt Comhshaoil
- Taighde comhshaoil a chistiú chun brúnna a shainaithint, bonn eolais a chur faoi bheartais, agus réitigh a sholáthar i réimsí na haeráide, an uisce agus na hinbhuanaitheachta.

Measúnacht Straitéiseach Timpeallachta
- Measúnacht a dhéanamh ar thionchar pleananna agus clár beartaithe ar an gcomhshaol in Éirinn *(m.sh. mórphleananna forbartha)*.

Cosaint Raideolaíoch
- Monatóireacht a dhéanamh ar leibhéil radaíochta, measúnacht a dhéanamh ar nochtadh mhuintir na hÉireann don radaíocht ianúcháin.
- Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as taismí núicléacha.
- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta.
- Sainseirbhísí cosanta ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Faisnéis Inrochtana agus Oideachas
- Comhairle agus treoir a chur ar fáil d'earnáil na tionsclaíochta agus don phobal maidir le hábhair a bhaineann le caomhnú an chomhshaoil agus leis an gcosaint raideolaíoch.
- Faisnéis thráthúil ar an gcomhshaol ar a bhfuil fáil éasca a chur ar fáil chun rannpháirtíocht an phobail a spreagadh sa chinnteoireacht i ndáil leis an gcomhshaol *(m.sh. Timpeall an Tí, léarscáileanna radóin)*.
- Comhairle a chur ar fáil don Rialtas maidir le hábhair a bhaineann leis an tsábháilteacht raideolaíoch agus le cúrsaí práinnfhreagartha.
- Plean Náisiúnta Bainistíochta Dramhaíola Guaisí a fhorbairt chun dramhaíl ghuaiseach a chosc agus a bhainistiú.

Múscailt Feasachta agus Athrú Iompraíochta
- Feasacht chomhshaoil níos fearr a ghiniúint agus dul i bhfeidhm ar athrú iompraíochta dearfach trí thacú le gnóthais, le pobail agus le teaghlaigh a bheith níos éifeachtúla ar acmhainní.
- Tástáil le haghaidh radóin a chur chun cinn i dtithe agus in ionaid oibre, agus gníomhartha leasúcháin a spreagadh nuair is gá.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil
Tá an ghníomhaíocht á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóirí. Déantar an obair ar fud cúig cinn d'Oifigí:
- An Oifig um Inmharthanacht Comhshaoil
- An Oifig Forfheidhmithe i leith cúrsaí Comhshaoil
- An Oifig um Fianaise is Measúnú
- Oifig um Chosaint Radaíochta agus Monatóireachta Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tá Coiste Comhairleach ag an nGníomhaireacht le cabhrú léi. Tá dáréag comhaltaí air agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair imní agus le comhairle a chur ar an mBord.

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A Community-based Social Marketing Approach for Increased Participation in WEEE Recycling (ColectWEEE)

Authors: Katherine Casey, Maria Lichrou and Colin Fitzpatrick

Waste electrical and electronic equipment (WEEE) is the fastest growing waste stream in Europe. Extremely hazardous if handled incorrectly, WEEE contains many precious and critical raw materials, which are strategically important to the development of European industry as part of the circular economy. The current and revised WEEE Directive broadens the scope of WEEE to include almost all WEEE. The most substantive changes concern the redefinition of the collection targets, which are now based on the percentage of the EEE placed on the market as opposed to a universal flat rate. To meet the revised targets, Member States need to encourage increased WEEE recycling.

Identifying Pressures

Project ColectWEEE explored consumer experiences with WEEE. The project generated insight into what people do with their small WEEE. Data collection consisted of in-depth interviews with consumers in their homes and observations at WEEE collection points. The results should be of interest to all stakeholders involved in the promotion of WEEE recycling, including consumers.

Informing Policy

Ireland is currently meeting the targets set by the WEEE Directive, with high collection rates predominantly in the categories of large household appliances and fridges/freezers. Collection rates for smaller WEEE are less successful by comparison. People tend to hoard small electrical and electronic devices in their homes or dispose of them in the general waste. The research found that, in general, consumers do not conform to policy when it comes to small WEEE, but even more so in the case of peripheral devices. To encourage increased recycling, researchers and policymakers need to better understand the dynamics of small WEEE within the home. This calls for a reconciliation of the policy perspective on small WEEE with the subjective experiences and interpretations that drive consumers' behaviours. Addressing this need, the project utilised consumer research to investigate WEEE disposal behaviours from an "emic" perspective, that is, people's experiences and interpretations of WEEE and its disposal, as these occur in everyday life.

Developing Solutions

Research findings from this research suggest that, for consumers, electronic and electrical devices exist in fluid, in-between states of meaning and perceived value, from the time of acquisition until their disposal. Small WEEE tends to be either consciously stored or abandoned in the home until a trigger prompts consumers to divest. Prompted to divest, consumers must decide what precisely to discard and how. Interventions can be introduced to make small WEEE more visible at home and to encourage consumers to dispose of small WEEE responsibly. Short-term interventions should augment the visibility and accessibility of WEEE recycling and longer term strategies should address issues of communication and trust building. Furthermore, the implementation of a circular economy opens up many different areas where further research is needed to identify additional paths to increased WEEE reuse and recycling.

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