Electronic Waste: ResIST Case Study Report

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James Martin Institute ResIST Working Paper 10

Contributory to ResIST Project Deliverable # 19

April 2008

ResIST is a specific targeted research project - contract no CIT5-CT-2006-029052 - under Priority 7 of the European Commission's Sixth Framework Programme: *Citizens and Governance in a Knowledge-Based Society*. We gratefully acknowledge the Commission's support.

1. Introduction

Since the early 1990's, electronic waste has formed an increasingly prominent focus within broader discussions regarding concerns in escalating amounts of waste and problems with waste management. It was suggested that the UK produced around 1million tonnes of electronic waste per year (Guardian, 2002) and the European Union produces 6.5million tonnes. However, as a result of e-waste legislation which attempts to account for electronic goods on the market, the UK estimate has doubled to 2million tonnes. E-waste is growing three times faster than any other waste stream (SVTC, 1999) and the usable lifespan of electronic products keeps shrinking (average electronic lifespan used to be eight years, now it is down to two; SVTC, 1999). It is estimated that by 2010 there will be a further 716million computers in use, with 178million new users in China and 80million new users in India (Greenpeace, 2008). However, although much of the broader debate centres on the bulk or weight of waste (for example, how much households throw away, the apparent lack of space for landfill, the need to recycle or reuse to limit waste bulk and save space), e-waste does not occupy a large proportion of waste weight (perhaps around 1% of waste, CEI, 2005). This has led some to argue that e-waste is a small problem, on which we should not pass legislation which may in any case restrict economic growth (CEI, 2005).

However, for some commentators size in this case does not appear to matter. In place of a focus on size, much of the discussion on e-waste is focused on toxicity – the concentration of metals and plastics in electronic goods which can become harmful when attempts are made at disposal through burying e-waste (landfill), burning it (incineration, sometimes for energy generation) or dismantling it and re-using component parts or raw materials (recycling). An average PC contains over 1000 components, generating a potential array of environmental problems (SVTC, 1999). This debate on disposal toxicity forms one of three areas of e-waste concern, the others being the production of electronic goods (the materials used, the energy used in production) and energy consumption in usage of electronic products (and how this might be reduced). The debate on e-waste has led to the development of the Waste Electrical and Electronic Equipment (WEEE) directive and Restriction on Hazardous Substances (RoHS) directive. These directives aimed to introduce a system which would manage, regulate, count and assess – in short, hold to account – electrical and electronic equipment. This report will focus on the challenges of this e-waste accountability. It will begin with an introduction to accountability before looking at the global context of e-waste. The report will then analyse the challenges of e-waste accountability before concluding with ways forward.

2. Accountability

In a general sense accountability relates to those occasions where some particular feature of activity is made available to be assessed. However, in practice there are a variety of approaches to accountability. The report will briefly outline these approaches by drawing together work from sociology, development studies, management research, science and technology studies, anthropology and philosophy. These approaches can be organised into four areas of: face to face, metric, transparency and engagement-based forms of accountability. Although in practice these often overlap, they are separated out here for ease of presentation. In subsequent sections the complexity and blurring of these approaches in instances of accountability will be highlighted.

Face to face forms of accountability relate to the sense in which forms of interaction are occasions of accountability. For example, conversations might involve one speaker providing an utterance to be held to account by a second speaker whose subsequent response is then available to be held to account by the first speaker (Garfinkel, 1967; Luff and Heath, 1993). This approach treats accountability as a pervasive phenomenon, constitutive of everyday forms of interaction (constitutive in that through holding each other to account, more or less mutual intelligibility is accomplished). However, the form of accountability outlined can be characteristic of professional as well as everyday settings (Lynch, 1998; Suchman, 1993). In professional settings, the ways in which face to face interactions operate as moments of accountability are tied into organisational structures (for example, meetings are held as opportunities for parties to hold each other to account and those meetings form part of the structure of the organisation as they are timetabled, minuted and their existence becomes an expectation amongst organisational members). Face to face forms of accountability are characterised by more ad hoc, less systematic forms of interaction than other areas of accountability. This can be both advantageous (in that problems with for example, metric forms of accountability are easier to avoid) and disadvantageous (accountability of this form can sometimes appear less organised or rigorous). An important principle of face-to-face forms of interaction is mutual accountability – each gets to hold the other to account. This is less apparent in other modes of accountability.

Metric forms of accountability relate to those systems of assessment where an organisation is measured according to certain principles, expectations, standardised measures, benchmarks, performance indicators and so on (see Power, 1997; Baxter and Chua, 2002). The metrics form the focus for accountability. The metrics draw together the aspects of the organisation to be measured and operate as principal ways in which the organisation steers itself and through which its members come to prioritise certain types of

activities and organisational goals (Miller, 1992; Miller and O'Leary, 1994; Rose, 1999). Metrics are often tied into further forms of accountability such as external auditing whereby organisations are expected to be able to demonstrate that they have adhered to certain measurement standards and practices. A drawback of this approach to accountability can be that the areas of activity to be measured do not remain as measures, but instead become targets to aim toward. In this way, the metrics can be consequential for the types of activity that the organisation carries out (see, for example, Strathern, 1999; 2000; 2002). For example, when the UK government set out to measure Universities, they developed the Research Assessment Exercise which was a publication based metric. However, in place of measures of publications, came a nation of University academics all trying to publish in certain journals, in a certain time-frame; the publications became a target to aim toward. This has led to a skewing of academic priorities towards publications (in order to succeed in assessment) and away from other areas which would not come under scrutiny but might still be valuable (such as the extent to which academics have engaged in work of practical consequence). Such an approach to accountability is fine for as long as the metrics are considered appropriate and their potentially narrowing consequences are considered manageable.

Transparency[1] as a mode of accountability refers to those actions understood as carried out, usually by an organisation, on behalf of an often unspecified mass audience. This includes, for example, company accounts made available for the public good or in the public interest. In effect these 'publics' tend to be fairly narrow and specialised (those who are interested in and have the time and skill to read reports, accounts and other ephemera made available by organisations; that is they are not, in practice, often noted as members of the general public; for more on transparency systems, see Gray, 1992). This form of accountability includes calls for organisations to make certain types of information available and for (sometimes publicly funded) organisations to demonstrate their value for money, responsibility (social, corporate) and ethical standards. Demands for transparency are made in relation to, amongst other things, the media (Media Transparency, 2003), global political campaigning (Transparency International, 2003) and corporate organisations (Shaw and Plapinger, 2001). Like metric approaches, transparency forms a set of organisational principles as organisations are actively encouraged to adopt particular protocols on making information

[1] Transparency has been considered from a number of different perspectives in poetry (Gordon, 1969), post-modernism (Vattimo, 1992; Baudrillard, 1993), philosophy (Westphal, 1986), political analysis (Wall, 1996), psychology (Tagiuiri et al, 1955) and studies of accounting (Humphrey et al, 1995; Gray, 1992; Zadek and Raynard, 1995; Sikka, 2001; Canning and O'Dwyer, 2001; Drew, 2004).

available for assessment and, indeed, for public organisations their funding can depend on an ability to demonstrate that they have adhered to these protocols. Problems with this approach to accountability involve questions regarding whether or not information made available matches internal organisational activity, whom information is made available to, what sense is made of information made available (see Wall, 1996) and how information is used (often, making information available becomes the end goal, a box to tick to demonstrate adherence to a principle rather than for any clear practical benefit; Neyland, 2007).

Engagement-based forms of accountability relate to those structures which actively invite audiences external to an organisation to participate in an aspect of the organisation (for an overview, see Irwin, 1995; Kleinman, 2000; Kitcher, 2001). This is not the same as members of an organisation holding each other to account face to face, or metrics and transparency standards and protocols being used as a means to make information available. Instead, engagement-based forms of accountability revolve around particular set-piece moments where those external to an organisation are offered an opportunity to enter into interaction with (an aspect of) the future direction of that organisation. This can involve citizen juries, deliberative, democratic decision-making, participatory budgeting, public involvement in new scientific developments and so on. The means of engagement becomes an opportunity for accountability and for assessment of the appropriate way forward for a particular area of organisational activity. Theoretically speaking this engagement also becomes an important means of steering the organisation; in theory the organisation and its members are steered by an awareness of the need for engagement, make decisions about appropriate areas of engagement and look to use engagement as a means for steering future activity. Problems with this approach relate to the means of engagement (what would form an appropriate structure for outside involvement in an organisation's decision-making, what sort of information should people be provided with, how to handle, for example, market sensitive information), who gets to engage (that is who is invited – which can be a broad-based invite to the general public – and who turns up – which can be a problematically narrow group with a specific agenda, such as those who may wish to protest against an organisation) and with what outcome (in a similar manner to transparency based accountability where information availability becomes the end-point, in these activities engagement can become the end-point with no clear consequence).

The next section will look at how these modes of accountability can be understood in relation to the global picture of e-waste. Each of the forms of accountability plays a role in e-waste management, however the forms of accountability come together in complex ways and with unanticipated consequences.

3. Global background to e-waste

There has been very little academic research carried out on electronic waste specifically (notable exceptions include the work of Grossman, 2006; Saphores, et al, 2006; Wynne, 1989; BRASS, 2006). Research on waste more generally has focused on issues of rubbish and disposal (Chappells and Shove, 1999a, 1999b; Douglas, 1984; Hawkins, 2000; Hetherington, 2002; Munro, 1998; Strathern, 1999; Strasser, 2000; Thompson, 1979). Research raises questions of: what counts as rubbish (Thompson, 1979); how the history of disposal has developed (Chappells and Shove, 1999a; 1999b); how we come to terms with throwing things away (Hetherington, 2002; Gregson, 2005); how we understand re-use (Strathern 1999); attitudes towards composting (Tucker, 1999); and the role of community waste projects in influencing household behaviour (Sharp, 2005). This section draws together a variety of work from media and NGO sources in providing a global background to issues of e-waste.

3.1 US and Japan

Despite several attempts (Government Technology, 2006) the US has yet to pass national legislation on e-waste. Several states (ES&T, 2006) have passed legislation which impels producers of waste to take responsibility in partnership with local authorities for the collection, recycling and/or disposal of electronic waste. Major technology producers such as HP have campaigned against state level legislation which might require different actions in different parts of the country and favour those companies focused in some states rather than others. Much of the concern in the US has focused on the costs of locally handling e-waste. It is said that shipping a monitor to China for 'recycling' is ten times cheaper than recycling it in the US, although currently 75% of old electronic goods remain stored in US homes (SVTC, 1999). This situation is noted (Wired, 2003) as being further behind in e-waste action than both the EU and Japan.

In Japan, it is suggested that means of addressing e-waste are further developed. For example Matsushita have put into production 100% recyclable electronic products and IBM has produced (very expensive) goods made from 100% recycled plastics. Furthermore, the collection and disposal of technology is under way with producers taking responsibility for their products (BBC, 2003). However, initiatives that have begun in the US have not always met with positive PR. Dell's attempts to recycle technology components through the use of prisoners as cheap labour, met with protests regarding lax health and safety standards (see New Standard, 2006; a Dell spokesperson countered that prisoners were being given the chance to

recycle their lives alongside the PC's; Wired, 2003). The US currently landfills around 4.5million tonnes of e-waste per year and somewhere between 50-80% of e-waste collected for recycling is sent to China, India or Pakistan (Wired, 2003). Uncertainty in these figures derives from companies' unwillingness to publicly declare their recycling success/failure. There have also been concomitant problems with paper audit trails of waste which leave one port in one country labelled as one thing and arrive in another port labelled as something else. The extent to which labels match the content of shipping containers is uncertain (BBC, 2005a).

3.2 Developing world

This mass movement of e-waste collected for recycling to the developing world introduces problems for those countries. For example, under Indian law, PC's are not treated as hazardous waste, but are instead termed donations or recyclable goods (BBC, 2005b). Some of the donated equipment is said to be no better than scrap (EHP, 2006) and some of the recyclable equipment or components are difficult to get at, with processes of recovery posing threats to the environment (BBC, 2005c). It appears that once in India, these technologies join a growing mountain of obsolete equipment from rapidly expanding technology centres such as Bangalore. 'Recycling' e-waste in India involves hundreds of small-scale, local initiatives involving possible exploitation of cheaply available/exploitable labour and producing waste by-products which appear set to do long-term damage to local environments including agriculture, waterways and fish populations (India Together, 2003). However, it is also argued that without these recycling initiatives in the slums of, for example, Mumbai, there would be a great deal more e-waste left untreated; simply getting rid of hazardous practices of recycling (or what might be more accurately termed scavenging; Seattle Times, 2006), does not get rid of e-waste (Observer, 2007). The Karnataka State Pollution Control Board, via the Central Pollution Control Board, are now attempting to regulate large IT companies directly (Hindu Business Line, 2008). A similar picture is apparent in China where components of PC's are cooked by locals in woks in order to separate out raw materials (after which some materials are simply dumped on the ground; New Scientist, 2002). Although many of the components are deemed toxic by the World Health Organization (see Ban, 2002), it is not clear whether further damage is done to local inhabitants and their environments by the combined cooking and dumping of toxins (SVTC, 1999; Ban, 2002). China has (since 2006) begun producing its own guidelines on the management of e-waste (Ministry of Information Industry, 2006).

3.3 European Union

EU Legislation

In response to concerns regarding increases in the e-waste-stream, the toxicity of such waste and its shipment to parts of the developing world, the EU has developed several directives. The first of these is the Waste Electrical and Electronic Equipment (WEEE) directive. This directive focuses on reducing e-waste, treatment, recovery and recycling of e-waste, enhancing environmental performance and producer responsibility. Under the principle of Extended Producer Responsibility (EPR), manufacturers should be in a position to 'take back' (i.e. provide a basis for recycling, even through a third party) products from users. EPR is an extension of the polluter pays principle and is enshrined in the European Union's Fifth Environment Action Programme. The logistical costs of the latter can be met through product price, systems for take back can be operated with nation state governments and (in theory) producers may gain competitive advantage by producing more recyclable products which will cut down the cost of take back schemes.

There is a growing number of profit and not-for-profit organisations focused on providing the means to dispose or manage the recycling and re-use of e-waste. These organisations include charities (such as Digital Links, 2006; Donate a PC, 2006) and for profit firms (such as PC Disposals, 2005; CCL North, 2006; WeeeCare, 2006; e-cycle; 2006). For profit firms vary in the promotion of their services from suggesting they can handle the complexities of e-waste legislation to suggesting they can boost corporate social responsibility. At the same time, charities aim to take donated equipment such as PCs to the developing world.

Under the WEEE directive there are ten categories of e-waste:
1. Large household appliances
2. Small household appliances
3. IT and telecoms equipment
4. Electronic and electrical tools
5. Consumer equipment
6. Lighting
7. Toys, leisure and sports equipment
8. Automated dispensers
9. Medical devices
10. Monitoring and control devices

The second area of legislation is the Restriction on Hazardous Substances (RoHS) directive. This suggests that no goods (from the first eight categories of the WEEE directive) should come onto the EU market after July 1st 2006

which contain: heavy metals (lead, mercury, cadmium, hexavalent chromium) and flame retardant plastics (polybrominated bipheryls (PBB), polybrominated dipheryl ethers (PBDE)). Each of these materials should make up no more than 0.1% of products except for Cadmium which should only make up 0.01% of products. There are some exemptions to this directive such as the repair of equipment and goods used to repair old equipment (i.e. equipment produced placed on the market prior to July 2006). There are also numerous complex definitions in the legislation so that radios for example are e-waste, but car radios are not (because they are treated as a fixed attribute of the car). Microwave ovens are e-waste, but if installed in commercial kitchens their status is less clear (because they may be a fixed attribute of a commercial industrial setting in the same way that pipes are part of an oil rig and are not e-waste). Batteries are neither e-waste nor a hazardous substance, but if they are left in electrical goods by consumers, they must be 'taken back' by the producers of the product. However, once 'taken back' batteries are still not considered hazardous and so the minimum acceptable standard of treatment for batteries is that they are taken out of e-waste products (after which they may fall under the batteries and accumulators directive).

Beyond these two directives, e-waste is also subject to regulation in relation to its packaging (under the Packaging and Packaging Waste directive, overseen by DEFRA and BERR in the UK), will be subject to further scrutiny in terms of environmental design (under the recent Eco design for Energy Using Products regulations, overseen by DEFRA and enforced by local trading standards departments in the UK) and its movement to other countries is controlled (under the Transfrontier Shipment of Waste regulations, overseen by the Environment Agency in the UK). The latter means that (drawing on the UK as an example) anyone wishing to export e-waste for disposal is prohibited from doing so. Anyone wishing to export for recycling must use an Approved Exporter (approved by the Environment Agency), using an appropriate means of recycling or a re-use scheme (and Approved Exporters must issues evidence notes which show that facilities used abroad match those found in the European Economic Area). Questions have been raised regarding what should count as appropriate recycling and questions still remain about re-use (whether or not items are in a useable state, what happens to goods after re-use and so on). Turning attention to the implementation of regulations can help us understand more about the complexities of e-waste accountability.

Implementation

The area of e-waste legislation initially focused on the UN development of the Basel convention (1989) which attempted to limit developed nations' export of hazardous materials to the developing world. This convention has

been through several iterations without the US as signatories. The convention does not cover 'recyclable' material. Draft versions of the EU directives were written in the late 1990's and became law in February 2003. However, changes were made between the draft and final stages. Several aspects of the directives were reoriented from demands to suggestions. For example, after extensive lobbying by US technology firms, the RoHS directive no longer contained the rule that all new PC's should be made from 5% recycled plastic; instead manufacturers would simply be encouraged to use as much recyclable material as possible. Subsequent to the legislation being recognised by the EU in 2003, it was expected member states would adopt the directives into domestic law by August 2004 with the first collections and recycling of e-waste carried out by December 2006. However, by summer 2004, 24 out of 25 member states had failed to satisfactorily incorporate these directives into law (Greece was the only member state to have satisfactorily responded to the directives). In the summer of 2005 the EU threatened action against the UK along with Estonia, Finland, France, Greece, Italy, Malta and Poland for failing to comply with the directives (ZDNet, 2005). The UK's Department for Trade and Industry (DTI) continued to promise compliance, however the date for such compliance frequently shifted (from 2004, to July 2005, to January 2006, to June 2006). The UK finally implemented the WEEE directive in 2006.

Practical implementation of the WEEE directive differs between European member states (see next section). Drawing on the UK as an example can help illustrate the initial practical complexities of dealing with e-waste. The Department for Business, Enterprise and Regulatory Reform (BERR, part of the replacement for the DTI) have taken the lead role in co-ordinating WEEE. For electronic goods placed on the market after August 13th, 2005, producers must sell branded products featuring the WEEE symbol (a crossed-out wheelie bin) and retailers must inform consumers of the opportunities they have for responsibly disposing of WEEE. Although consumers can still legally throw electronic goods in the conventional household waste, retailers must have in place a means to take back 'equivalent' (like for like) goods on new purchases, either in-store or through a take back scheme (even if replacing historic WEEE, created prior to August 13th, 2005). There is a national Distributor Take Back Scheme in the UK run by Valpak and enforced by the VCA. This take back scheme delivers items to Designated Collection Facilities where waste is handed over to Approved Authorised Treatment Facilities (AATFs, approved and authorised by the Environment Agency). Consumers also have the opportunity to take goods directly to these centres and on-line retailers must offer customers routes to taking back equivalent electronic goods. Retailers offering in-store take back schemes must then also deliver goods to Designated Collection Facilities (the Consumers' Association in the UK has attempted to provide more information on the retailers who offer in-store take back; see Which?,

2008). At this point consumers' and retailers' responsibility for e-goods ends.

AATFs operate in conjunction with Producer Compliance Schemes. These are designed to ensure that accurate evidence of e-waste is collected, that waste is handled in environmentally appropriate ways (recycled where possible) and that producers meet their obligations under the WEEE directive. AATFs can have contracts in place with other organisations for dealing with waste (these are regulated by the Environment Agency and include Approved Exporters under the Transfrontier Shipment of Waste regulations). Waste management organisations may require further certification, for example in information security management, if they are handling old personal computers. Producers have to provide evidence every three months of electronic goods that they have placed onto the market. AATFs also have to provide evidence annually of the amount of electronic goods they have handled. This evidence is compiled by the WEEE Settlement Centre which then produces evidence of the amounts of e-waste produced and handled and the extent to which the UK is meeting the EU target of recycling 4kgs of e-waste per person per year (the Settlement Centre is also overseen by BERR). Currently the UK is exceeding this target.

Producer Compliance Schemes are run by a variety of organisations and can be individual (for a particular producer), collective (for several producers) or focused around a particular type of electronic good or a particular geographical region. A producer organisation must be able to prove (to the Environment Agency) that it has signed up for a scheme and is providing accurate information and must re-register annually. The producers' market share of e-waste is calculated based on its returns and then the compliance scheme to which it has membership must handle that much waste on its behalf. The producer must then cover this cost. If required, the Settlement Centre would have to be involved in balancing the figures. For example, if producers place a great deal of electronic goods onto the market place and the scheme to which they have signed up has not handled sufficient amounts of waste to cover their total, the scheme may have to 'buy' waste evidence at an agreed price (the price should be based on the costs incurred by the Compliance Scheme selling the evidence). The Producer Compliance Schemes are operated by a variety of different organisations. For example, Valpak who operate the Distributor Take Back Scheme also operate a Producer Compliance Scheme (although these are kept very separate).

Alongside the management of WEEE, RoHS has also involved a practical implementation. The RoHS directive in the UK has been enforced by the National Weights and Measures Laboratory (NWML). NWML attempts to test and assess the extent to which electronic goods placed on the market comply with the hazardous substances prohibitions included in the directive. Selecting goods is based on initial detective work regarding possible likely

breaches or whole sectors which might risk non-compliance. Letters are sent requesting further information on products and their contents, and compliance officers assess these returns. If information is deemed insufficient, officers can request full compliance data, carry out test purchasing and disassemble goods for analysis. If an offence is detected, a case officer is appointed. Outcomes at this point can be:

- No Further Action required (if, for example, an organisation has already taken steps towards compliance)
- Improvement Plan (which can involve temporarily removing offending goods from the market)
- Compliance Notice (which requires a demonstration of compliance)
- Warning Notice (which may involve future corrective action)
- European Notification (which involves sharing information through the European Network of Enforcement Bodies)
- Caution (which is a formal legal notice issued in the public interest, based on companies not operating due diligence; in the future it may be possible to issue a Conditional Caution with the possibility of restitution resolving the problem),
- Prosecution (taking legal proceedings)
- Public Disclosure (if problems are persistent)

Although some offences require evidence of responsibility (e.g. the defendant knew that their action was wrong), RoHS is absolute (e.g. if the product contains hazardous substances, the law has been broken). However, companies can enter a defence of due diligence and argue that every possible step was taken to prevent a problem (for RoHS this means production processes were controlled, frequently checked and everyone knew how the system should work).

Suspect goods are subject to testing by NWML. A range of technologies and techniques are drawn on to assess the content of a product, including, for example, x-ray fluoroscopy. The results of testing are categorised in the following ways:

- The product is compliant (traces of hazardous substances are below RoHS thresholds or non-existent)
- Uncertain (the results are inconclusive and suggest more than a trace of a hazardous substance)
- Questionable (the results indicate hazardous substances between the maximum allowable under RoHS and twice the maximum allowed)
- Non-compliant (the results indicate more than twice the maximum allowed).

This suggests that the system developed for managing e-waste through the WEEE and RoHS directives engages in all four types of accountability.

- *Face to face* accountability operates through various forms of inspection and meetings between different regulatory and enforcement agencies, producers, retailers and representative bodies.
- *Metric* forms of accountability operate in relation to the numbers collected for evidence of quantities of e-waste on the market and being handled, the extent to which the UK is meeting e-waste targets and what future action may be required.
- *Transparency-based* accountability operates through producers making information available, AATFs making information available and retailers offering information to consumers all of which can be used by external audiences to make assessments of organisations and formulate responses.
- *Engagement-based* accountability operated initially in successive consultation exercises between government and, for example, producers and retailers on the future implementation of WEEE and RoHS directives.

However, this only considers the system guidelines. To understand more about e-waste and accountability we need to take a closer look at the practices involved in implementing e-waste regulations. The following section draws on interviews with members of 14 organisations involved in e-waste, primarily in the UK but some of whom also operate across Europe and beyond.

4. The challenges of e-waste accountability

This section will now turn attention to the practices of organisations involved in the regulation of e-waste. Getting close to the practices of e-waste regulation can help highlight some of the challenges involved in this area. First, the report will analyse challenges in the WEEE directive and, second, the ROHS directive. Ways of dealing with these challenges will feature in the Conclusion to this report.

4.1 The WEEE directive

Logistics

An initial challenge in the management of WEEE has been the logistics involved in setting up and operating a new waste management system. There have been suggestions that there is still e-waste unaccounted for (perhaps stored in people's attics or just disposed of with conventional household waste), that there are variable costs across the country for handling e-waste in an environmentally responsible manner, concerns raised

about items which are exported and the strength of export controls, issues of licensing (of, for example, AATFs) and suggestions that the system focuses too narrowly on the management of waste (rather than focusing on, for example, reducing the amount of waste produced in the first place). Calls have also been made for a switch in emphasis from collective producer schemes to individual schemes to encourage producers to innovate with more eco-oriented electronic products (at present collective schemes are costed based on weight of goods on the market, with no discount given to producers who have designed goods to be easily recycled). The logistics of WEEE led to a range of responses from interviewees.

Interviewee 3 (DARP):

> It is, truly a fantastic piece of legislation. The problem is, it's how it's implemented.

One aspect of implementation which has proven a problem has been the extent to which the WEEE collected represents any particular proportion of WEEE out in the world.

Interviewee 7 (DEFRA):

> I think from our perspective and I think BERR would accept this, not a huge amount stuff is being collected, not as much as perhaps we would have hoped.

Interviewee 6 (Environment Agency):

> we've had half a million tons declared to us by the people who've registered – [no-one] has come forward as saying that's spot on – that's twenty percent – that's ninety five – you know what does that represent? You know from previous estimates of WEEE – I mean I'm a little surprised that the household figure is as high as it is and I would expect the business figure to be higher. So what we could have here is a situation where some of the business equipment is being declared as household… maybe someone thinks they are pulling a fast one.

However, these issues of evidence are not straightforward. Just as the Environment Agency is figuring out how much WEEE might have been collected, the producer compliance schemes have run into problems with evidence trading through the Settlement Centre.

Interviewee 5 (VALPAK):

> well, a couple of the very small schemes but one in particular over contracted to the tune of – well, one of them in particular had an obligation of less than 1% but contracted 25% of the UK collection sites. Which has caused an evidence deadlock really and has kind of threatened the whole system really. And what happened, obviously that company saw an opportunity to secure a surplus supply of

> evidence and then because they anticipated that there would be a trading element to the evidence they assumed that they would be able to sell that evidence for a premium because there would be a fixed level of demand for it later in the year. And what actually happened in practice is that because most compliance schemes have themselves covered quite well, we ended up with a deadlock between the largest compliance scheme and this smaller compliance scheme that had secured all of the supply. And what happened is that that compliance scheme ran out of money because they weren't – basically [the larger scheme] refused to buy any evidence from them. And so they encountered cash flow problems which meant that collections actually – I believe they stopped in some cases because they weren't able to pay the collection companies and treatment companies.

This interviewee also suggested that there remain organisations which have not signed up to the schemes, but their products are still going through the scheme.

Interviewee 5 (VALPAK):

> there are still companies that are free riding that haven't yet joined.

Interviewee 6 (Environment Agency):

> a key one moving forward is to take action against free riders. So producers who should have registered but failed to do so and we have been able to take that a number of ways. One way is through cold calling over four thousand businesses to say, 'look you seem to be in industrial classifications associated with electronics. A lot of people with a similar profile to you are registered. Why aren't you?' Also looking at people who were registered for the first period but haven't renewed their registration.

These logistical problems involving setting up and operating the system have also included problems with registering sites for inclusion in the WEEE management scheme.

Interviewee 3 (DARP):

> I sit in an Environment Agency [meeting] at the moment to check for basic UK licensing. And I'm afraid they just don't know enough about re- recycling and so somebody says what are you doing in that tin and say oh look; this is what we say we're doing on the outside of the tin. But they don't know, but they look in to check that what they're saying is – everybody gets an AATF licence just by applying for it, yeah? And the EA, because it's new, they can't – and because you know, these people – you know, they're often younger. They might not have years of experience. They can't walk into a process plant

> and just look and go: actually there's no way that you're doing what you're saying. So that people – we accept people's word a little bit too much I think for what's inside the tin.

Interviewee 6 (Environment Agency):

> I mean the criteria for approval is set out in the regs. First time round to be honest little grounds for turning anyone down because they have got no track record. They've got no previous non-compliance and so I think to be honest most people are given the benefit of the doubt provided they put in a sensible business plan. What we do is then review those operational plans and we'll certainly look at people's compliance history. So if they're late with data, if they submit inaccurate data and certainly if they fail to meet their member's obligations then they should anticipate loss of approval and or prosecution.

Amongst these problems with the logistics of setting up and initially operating the scheme, some business to business purchasers and users of electronic goods have decided to manage electronic waste themselves.

Interviewee 10 (University Purchasing):

> I do know that there are a number of universities that have just decided that its too much effort to try and go through that rigmarole with producers and they are just going to take the responsibility for disposal and management themselves. And presumably the cost of it.

In many ways the WEEE management system is very new (although it does draw upon some legacy infrastructure and practice). It is too early to make bold declarations regarding the failure or otherwise of the system. Instead these logistical challenges should be considered as areas which may require further attention or may inspire further scrutiny in years to come. The Conclusion to this report will look at some of the possible futures of WEEE in more detail. However, it should not be assumed that logistics of setting up and operating a WEEE management system are the only area in which challenges have been faced. Interviewees in this research also discussed issues of harmonisation, going beyond the narrow confines of the directives, awareness raising and enforcement.

Harmonisation

Beyond the logistics of setting up and running a national WEEE management system, concerns were raised by interviewees regarding the picture across Europe. Although the UK has set up one type of WEEE management system which adheres to the directive, across other members states there have been a variety of other responses.

Interviewee 9 (BERR):

> So essentially you've got twenty three member states – twenty three different sets of regulations - twenty three different requirements for registration – twenty three requirements for if they have to join a compliance scheme, etcetera, etcetera so yes. You know I did a presentation about eighteen months or so ago to a group of Japanese electrical produces and their question was, we went to trade in a single market which is why we trade in Europe why have we got to do this twenty three times?

Harmonisation for e-waste management is further complicated by the different legal bases for WEEE as against RoHS. WEEE is subject to the implementation of different member states while RoHS is designed to be a single, absolute statement of substances allowed and not allowed in electronic goods.

Interviewee 8 (BERR):

> WEEE was one legal base and RoHS was another and although they have been sort of, you know twined together and there's been an umbilical link between the two that has caused problems because you know member states, if you are a manufacturer you've got different obligations in different member states under the WEEE directive depending on how they've transposed the legislation. Whereas under RoHS it's fairly straight – well fairly straightforward.

One way of dealing with this varied picture has been to introduce a European group which meets to discuss these harmonisation issues. It will be interesting to see how this group develops.

Interviewee 8 (BERR):

> Now because there was no common enforcement regime envisaged in the directive, the UK sort of proposed that we have – what we're calling an informal enforcement network because there is no legal base for having it so we talked to the commission – we talked to other member states. You know there's this committee that meets now about every six months called the Technical Adaptation Committee

Beyond rules

Several interviewees involved in this research sought to emphasise a need to go beyond what they perceived as the relatively narrow remit of the directives. This involved calls for producers, for example, to not only comply with the directives but excel in environmental performance, for those involved in compliance schemes to actively monitor those schemes

themselves and suggestions that many retailers already go beyond the requirements of the directives.

Environmental campaigners have expressed concern that the WEEE directive is too focused on the management of waste by, for example, setting universal targets across Europe for the collection of waste.

Interviewee 4 (Greenpeace):

> It's – you know, the four kilos a head is very difficult for member states like Bulgaria or Lithuania to meet, [not] because they're not trying but because they've never – you know they're still not generating that amount of waste.

These campaigners have also expressed concern about downcycling – the successive re-use of high-grade materials (which embody much resource) in lower grade applications. This is still considered recycling within the directive.

Interviewee 4 (Greenpeace):

> I mean in the UK [there] would be a lot of downcycling and now just to give you one example – I mean we select glass in separate colours And now it's all put in together. Because we're told it's going for road fill. I mean to me that's classical downcycling. And it is also the case in terms of electronics, I mean you know, obviously metals tend not to be down cycled. You know, precious metals, aluminium; you know, magnesium alloys that you'll find your lap top casings made of. But when it comes to plastics for sure.

Other interviewees suggested a different approach to going beyond the rules and argued that agencies involved in WEEE (from producers to users) should take a more active interest in aiding the successful management of waste.

Interviewee 5 (VALPAK):

> Valpak are planning to audit a percentage of our treatment facilities. For the sake of good practice although we're not legally obliged to do that or bound to – we're not compelled to do that. Two reasons really; one is to ensure that we're not using any treatment facilities that are at risk of being de-accredited because that would be very risky for us because we may have paid for evidence that isn't valid. And secondly from a kind of – just a CSR point of view really. You know, to make sure we're doing things properly. I mean I think theoretically we shouldn't have to do it because if the Environment Agency are only approving treatment facilities that are doing things legitimately then there should be no requirement for a compliance scheme to do it. But we need – yes, we need the extra assurance and it's very good for us to be able to tell the producers that – our

> producer members – that we are going the extra mile. But then of course you could follow that; you know, if we spend too much money doing that, that will make us uncompetitive and they [producers] will leave us.

Interviewee 6 (Environment Agency):

> some government departments export or allow their equipment to be exported and the precautions they take is obviously try to make sure they are using someone who is appropriately licensed or exempt. What we would urge them to occasionally visit those people and I think that's one of the recommendations in the NAO report that whether you are dealing with a charity or a contractor, it would be sensible to go and see the activity at first hand just to satisfy yourself that what's happening is what you expected. For example if you think they are wiping the data, just go along and see that they have got the kit to do it and they seem to know what they are doing because I think some businesses certainly do fall foul of – you know someone knocks at the door and say's 'hey mate have you got any old computers? I'll pay you fifty pounds a piece' oh that sounds good. We thought we would have to pay to get rid of them and of course that's as much due diligence as they show. And then of course the next thing they find out is that their equipment or their data has turned up on Dispatches or something you know and its all very embarrassing and the few hundred pounds perhaps they've made from the equipment starts to pale into insignificance compared to the damage that's been done.

The latter suggestion regarding auditing export companies responds to recent concerns regarding the donation and export of used electronic goods to developing countries. These initiatives have been criticised for security lapses (which have led to information being made available through donated hard-drives; BBC, 2006), irrelevance (it is argued pens and paper would be more useful than donating unsupportable PCs; BBC, 2004) and the uselessness of equipment (with some hazardous scrap materials being labelled 'donations' and sent to the developing world where they contribute to local pollution or are dismantled under exploitative labour conditions; EHP, 2006; India Together, 2003; New Scientist, 2002; SVTC, 1999; Ban, 2002).

Awareness

Awareness was raised as an issue by interviewees both in relation to the level of knowledge consumers may or may not have of the WEEE management system and retailers and producers awareness of their compliance requirements. Concerns were raised about the difficulties for

consumers to come to an understanding of precisely what the regulations might mean for them. For example, retailers should offer like for like exchange of electronic goods, taking back equivalent old goods when new goods are purchased. However, what counts as like for like is not straightforward. An old VCR is equivalent to a new DVD recorder, but is an old microwave equivalent to a new oven or an old radio equivalent to a new stereo? Probably not. Most interviewees identified this as a problem of consumer awareness.

Interviewee 4 (Greenpeace):

> I still don't think they [consumers] are sufficiently aware and we do feel part of that work – and yes, it's also our task as a pressure group to do that. But it's also the job of the companies to do it. They're very quick to advertise the newest specs of a PC – you know, a gadget and – but you know, they don't talk very much about the – you know, the environmental credential.

Interviewee 7 (DEFRA):

> we do need more consumer education. Up until now I think the focus has been on getting a system that works and having collection points that will take WEEE. Having producer schemes in place that will finance them and making sure that there are enough treatment facilities that are permitted and so on. But the system is now in place and certainly going forward there will be more publicity for householders to find out about the system that operates. There'll also be more information for the retailers who should be providing information to the public when they buy new equipment and that part needs some work as well because a lot of retailers either don't know or aren't providing good information to consumers. So that side all needs to be looked at.

Interviewee 6 (Environment Agency):

> I think something the government and ourselves were quite conscious of in July is that we didn't want to make a huge sort of song and dance with the public to say, '1st of July WEEE day clear out your attic, your loft, your shed and take it all to your CA site' because what would have happened is that every site would have been overwhelmed. Large amounts of this stuff would have been put in mixed waste skips and sent to landfill and the public would say, 'cor what a nonsense. What a waste of my time. I'm not going to bother with this again.'

Alongside consumer awareness, retailer and producer awareness has also been an issue.

Interviewee 13 (VCA):

> Make them [retailers] aware of our own web site, find out how much they know because still a lot of the retailers are either sticking their heads in the sand or telling us that you know, they weren't aware that it had come into place yet. You know, it's – we acknowledge that. You know, I think everyone accepts to a certain extent that it hasn't been publicised as well as it might have.

Representative bodies such as retailers associations have done much of the work of informing members regarding the implications of WEEE.

Interviewee 12 (RETRA):

> Hmm, there was a flurry when they – when we first introduced the distributors' take back scheme. That was operated via Valpak. Which we got into via our membership of the British Retail Consortium. Writing out to members to advise them that they should join this scheme. Whenever you tell anybody anything it always elicits vast quantities of questions.
>
> [But] the numbers of little old ladies carrying washing machines down the high street on their back demanding that shops take them back was not one of our main priorities as you will probably appreciate. I mean a lot of retailer members have done no changes whatsoever because they were already doing it.

Enforcement

A final challenging area identified for the WEEE management system was the complex issue of enforcement. Here questions were raised regarding the extent to which rules should be strongly enforced (for example, involving prosecution) or whether education and more information was an appropriate way forward. Further enforcement issues involved the difficulty of gaining good quality evidence, whether or not transgressions should be made public and low initial levels of compliance.

Interviewee 13 (VCA):

> So how do we enforce it? Very simply. We do what we call the mystery shopper which is something we started off originally back in July. And the mystery shopper can be a pensioner, can be male or female; it could be a 16 year old. They play the role of you or I. They literally go into a store; they don't identify themselves. They go in and they will ask about – I'm interested in buying a new TV or a new telescope. I've read somewhere or I've seen on the internet; there's a new regulation out. It's called the WEE regulation. Will you be prepared to take my old – you know, old toaster or old TV off me

> for free if I bring it into store? The response initially was disappointing I think it was fair to say in that the actual knowledge base by the retailers was very, very crude, okay?
>
> I personally consider that if I'm going to have to take the company to court then I've failed, all right; because I believe the processes that we have in place bends over backwards to assist. Compliance has been disappointing.

Interviewee 6 (Environment Agency):

> Certainly up until now its been very light touch because we recognise the first compliance period – you know its new for us – its new for everyone and its all about making them aware of their obligations, encouraging them to join a scheme and once they're in a scheme to a certain extent its job done because the scheme then can provide quite a lot of support and assistance. So that's the critical first stage. Now what we're finding is that perhaps if people haven't registered now they miss this deadline for the second compliance period, we start to form the view that its no longer perhaps ignorance of the regs its more of a deliberate decision.

It appears that the area of enforcement is most likely to change in subsequent years of WEEE management with attention turning from awareness raising and education to possible prosecution, public naming of transgressions and less acceptance of defences based on ignorance. This report will now turn attention to the RoHS directive which engages some of the same issues (such as enforcement) but from a different direction, involving different practices and with some different outcomes.

4.2 The RoHS directive

Challenges involved in operating a response to the RoHS directive have a similar look to the challenges involved in WEEE, however the specific practices are markedly distinct. The interviewees suggested that challenges for operating a response to RoHS included the legacy of e-waste that still contains toxic materials, problems with figuring out definitions for what is and is not allowed under RoHS and what has exemption status, levels of compliance and appropriate responses to non-compliance, problems with organisations outsourcing activities and having less control over goods, staff in producer organisations not always understanding the needs of RoHS and appropriate modes of enforcement.

Measurement uncertainty

The RoHS system in the UK is enforced by the National Weights and Measures Laboratory (NWML). An initial problem for NWML has been measuring whether or not a product contains a restricted hazardous substance. In many ways whether or not the hazardous substance is in a

product is the starting point for further action or non-action. However, results from, for example, x-ray fluoroscopy do not necessarily return definitive statements on the presence or absence of substances. NWML then have to deal with some uncertainty in results.

Interviewee 2 (NWML):

> we're a measurement organisation. We're weights and measures. We're used to working with measurement. We're used to working with measurement uncertainty. And we apply criteria to the measurements that allow us to work so we're looking for things that are at least twice the maximum concentration value before we start. Considering there's a significant risk that may require further attention… the nature of the test equipment is that you're likely to get reasonably high uncertainties. And if you have reasonably high uncertainties you need to apply some type of tolerance to your measurements to ensure that you have a level of certainty of measurement before you carry out any positive action. Now we're used to working with measurement uncertainty and making those type of decisions.

Although this might appear to suggest that measurement produces uncertain results, the awareness of such uncertainty becomes the focal point for management. Being in a position to manage uncertainty enables NWML to handle RoHS. Building into the system allowances for uncertainty enables NWML to do its job.

Awareness and compliance

In a similar manner to the WEEE management system, RoHS had to go through a stage of awareness raising. The particular challenge with regard to RoHS involved the communication of all the necessary technical requirements for compliance.

Interviewee 8 (BERR):

> I did a lot of work with the producers leading up to July 2006 basically to inform you know RoHS is on its way – you've got to comply. There was a lot of confusion how do you comply? We've produced guidance. We've tried to do things - our knowledge transfer or awareness raising or whatever you want to call it has been actively to go out to talk to the major trade associations and directly with the major companies. Now when you look at the electronics equipment, you know what does RoHS and WEEE cover? Most of that stuff isn't manufactured in the UK or manufactured by UK companies.

> You know they might have a subsidiary here but they are mainly American and Far Eastern countries. So we've actually taken initiatives. You know at first you know suggested by the commission to go out and talk directly to the manufacturers. So you know I've been lucky enough to go to Japan and talk to people like Sony and Panasonic and people like that and then I was off to the States to talk to the Hewlett Packard, the Microsoft's of this world because if they didn't comply with the legislation, they wouldn't be legally allowed to place their goods on the European market.

However, awareness-raising in order to encourage compliance is not straightforward. Work is required to figure out the complex chain of production for an electronic product. Although responsibility for ensuring compliance with RoHS falls to the producer, awareness-raising operates through the chain of production.

Interviewee 8 (BERR):

> You think how many components, self assemblies, bits and pieces are in that piece of equipment and they are all coming from different parts of the supply chain and as a producer mine's a Fujitsu Siemens computer in front of me. Fujitsu Siemens obviously have to know that every printed circuit board they buy is compliant with the RoHS directive.
>
> But that also that printed circuit board will be made up of components - someone will provide the transistors, someone will provide the lead solder … and all those different bits of the equipment need to comply with RoHS as well so you are talking about a supply chain that goes down seven, eight, nine tiers and their big problem has been getting their supply chain in line and understanding. So we've tried to do work with the supply chain as well. So we've talked to component manufacturers.
>
> But initially the big companies [are] no problem. But you go down to the guy who provides the chrome plating that goes on a transistor that ends up on printed circuit board that runs a washing machine. He doesn't even know where that chrome plating is going to end up and you say to him, you know what you are giving that company is it compliant with the RoHS directive and he will say, 'what?' [Laughing].

Despite this activity to raise awareness and the efforts put in to measure products and deal with measurement uncertainty, compliance is by no means universal. Indeed rates of compliance appear to be low. NWML suggest that absolute compliance for all components in an electronic

product only applies to around 10% or products. However, they also suggest that 90% of products are 90% compliant.

Interviewee 2 (NWML):

> We find 10% of the products we test that may be compliant that we don't find problems with. But then you've got to talk in terms of – there's again, going back to the speeding analogy is that you might say that 10% of the products – 10% of the people are driving under 30 miles an hour and 90% of people or 80% of people are driving between 30 and 40. And then there's that four, five per cent which are the ones that are the large issue to us.

Enforcement

The discovery of non-compliant products under the RoHS directive can lead to enforcement actions (as detailed under section 3.3 of this report). But the precise type of enforcement response is a matter of careful decision. Whether or not to prosecute, to educate or to make information public are each complex decisions.

Interviewee 2 (NWML):

> we are under a lot of pressure to make information public from lobbying organisations and from journalists. And we have a very strong policy that we do not generally make information – specific information available about individual companies. And the justification for that is our approach to enforcement is very cooperative. If we were to be forced to make information available about specific companies, whatever level of infringement they had, then we've considered this would be counter productive. In that if I went to company A and found a minor infringement or a minor problem and I had to make the information that we'd been investigating company A public, when we next go and visit – when we come and visit company B, company B will say no, I'm not going to be helpful. I'm not going to be cooperative with you; you can go – I'm not going to work with you to ensure compliance. You can take me to court because he's going to tell everybody that I'm non compliant anyway. And that's not meeting the objectives. We have been able to solve nearly all the issues we've found often by companies doing things like voluntary withdrawals.

Although RoHS may appear a more straightforward directive than WEEE – mostly focused around a list of substances that can or cannot be included in electronic products – this research suggests that around these prohibitions are decision making practices which establish the ways in which the RoHS directive will be operated. The practice of organisations involved in both

WEEE and RoHS feature aspects of accountability activities. These practices will now be taken up in the Conclusion of the report alongside consideration of the directions interviewees thought e-waste management should move in the next few years.

5. Conclusion

5.1 The future of e-waste

This conclusion will briefly set out some of the possible future directions for e-waste management, concerns which are being articulated and proposals which are being made. The first area of immediate future activity is the forthcoming review of the WEEE directive. Interviewees were divided between those who were concerned about its likely outcomes, thought it was too early for a review and those who were interested in seeing if there was likely to be any change at all.

Interviewee 8 (BERR):

> Now when it comes to a review, all those interests are trying to put in their views as well so we're trying to co-ordinate those and when we get a final document from the commission later this year, you know we might have to go through the whole process again. We'll wait and see how traumatic or radical their proposals are.

Interviewee 9 (BERR):

> Undoubtedly you know we're going to review the regs at some point. It's too early to do a fundamental review just yet because we are still checking what the creaks and cracks are and whether they are creaks and cracks or whether they are fundamental problems. So you know it's too early in the process to actually get a true feel for that.

Interviewee 11 (VALPAK):

> we have regular member meetings with them [distributors] and we've just started talking about what happens after our appointment ends because we're only appointed to offer this until the end of 2009. And so at that point we don't know what's going to happen and the overriding thing that came [back] was that they would like the same option to exist. To join the scheme and you know, we don't know how that's going to look in terms of funding or more consumer information or anything.

In terms of proposed changes to the directives and their implementation, the most frequently cited point of possible change involved a call for greater recognition of scale in the directives. It was argued by several interviewees that a de minimis (currently incorporated into packaging

legislation) giving exemption to smaller organisations could be incorporated into future e-waste management.

Interviewee 5 (VALPAK):

> we would suggest that it's an unnecessary burden on small companies, so it's a disproportionate kind of cost for them because they have registration costs, et cetera, for very, very small tonnages. So what we call the de minimis – it would make real logical sense to bring that in for WEE as well.

Interviewee 6 (Environment Agency):

> And so what we're doing we're looking in the first instance at the bigger producers and making sure they're on board and then going down the list. At some point we would probably take a view that perhaps going any further is counterproductive but there is an issue that the WEEE directive doesn't contain any de minimis on retailers or producers. Now that is something that we've highlighted as part of the review of the WEEE directive that some form of de minimis would be helpful although we recognise that's not necessarily a straightforward task because do you base it on turnover or do you base it on market share or do you base it on market share by category of equipment?

Further issues raised included reconsidering the way goods are packaged so that, for example, more information is offered to consumers on the costs of recycling and responsible waste management (on the basis that if consumers are made aware that they have paid for a service already, they may be more likely to use that service).

Interviewee 12 (RETRA):

> Well, we were always very keen on a visible fee for recycling.

Also discussed were definitions incorporated into e-waste regulations. It was suggested that some definitions were unclear and open to interpretation (perhaps even unscrupulous organisations who might be seeking to produce interpretations to their advantage).

Interviewee 6 (Environment Agency):

> that whole area of sort of scope and definitions is very murky and I think we'd like some more explicit exclusions within the directive itself. I mean some of the terms for example it says Luminaires are outside the scope. Now the word Luminaire isn't something you use every day. No two people seem to understand it to mean the same thing

Finally, suggestions were also made on the need for and work done to accomplish integration between directives. Although criticisms were made of different interpretations of WEEE across member states and different legal bases for WEEE and RoHS, the continually changing nature of this area of regulation was seen as an opportunity to manage more successful policy integration. With the development of the Energy Using Products directive also coming into being, some interviewees identified this as an opportunity to accomplish integration.

Interviewee 8 (BERR):

> The EUP directive – Eco design for energy using products. They put down proposals for a framework directive and those proposals went through the negotiations and were agreed in the middle of 2005 and they had to come into force by the middle of 2007. But the important word here is it's a framework directive. It's setting in place a framework. It's not actually applying that framework to any particular products at the moment. The way that happens is they will have directives on regulations underneath the framework which will then apply that framework – the Eco Design framework to different products and product categories. Now as I say the framework was agreed and when I said it didn't apply to anything its actually not quite true because it was retrospectively applied to three existing directives looking at boilers, refrigeration and electric light – luminaire ballasts which I didn't even know what they were but [laughing].
>
> [This] is now seen as an element of sustainable consumption and production and you should look at things like WEEE, RoHS and EUP as really the legislation that helps to bring about sustainable consumption in respect of products. So the dots are joining up. But it takes quite a lot of work to do that. Some people say the EU comes out with these big strategy documents and they are saying all the right things but they never actually do anything. Well what we are trying to do now is saying things like these directives which are doing a lot of things are actually being aligned with and supporting that whole framework and strategy

5.2 E-waste and accountability

This report has introduced the complexities of addressing e-waste. It has highlighted the scale of the problem, the advantages and challenges of attempting to tackle e-waste and introduced four modes of accountability as one way of thinking through some of the issues involved. Establishing and operating the WEEE management system and response to the RoHS directive has involved all four modes of accountability. These modes of accountability

are at the centre of activities. Face to face accountability operates through various practices of inspection and in meetings held between different agencies. Metric accountability has focused on targets for collecting waste per head of EU member states' population, on the collection of evidence of waste on the market, collected, disposed or recycled. Transparency-based forms of accountability are widespread in the collection and compilation of information which either is made public or is held back as a means to encourage compliance. Engagement-based forms of accountability will now begin once again with various consultations likely to precede the review of WEEE which will occur in the next 12 months. However, experiences with these areas of accountability have not been straightforward.

- *Face to face* accountability has operated in various forms of inspection. However, questions have arisen regarding the purpose and strength of inspections (for example, should inspections be designed for education or enforcement?), the level of knowledge required to understand waste management organisations (for example, do licensing organisations actually have a strong idea of what organisations they are licensing are doing and how could they develop a better understanding of those practices?) and the consequences of inspection (for example, do organisations tidy up their practices in anticipation of an inspection?)
- *Metric* forms of accountability have involved the compilation of numbers which will be compiled to hold to account organisations involved in e-waste management. Challenges have arisen in regard to the appropriateness of these numbers (campaigning organisations, for example, have suggested that the system is focused too strongly on counting and measuring waste rather than effectively encouraging reduction of waste), other numbers which could be compiled (for example, at present there is no clear picture of whether or not the amounts of e-waste managed through the system are a success or a disappointment) and the consequences of evidence compilation (with, for example, the WEEE Settlement Centre running in to problems with evidence trading).
- *Transparency-based* modes of accountability have involved the compilation of evidence which could be made publicly available to name and shame organisations into compliance. Thus far decisions have been taken not to make this information available on individual companies and even aggregate data on whole industries has been kept from public view. This is currently justified on the grounds that enforcement can be aided by not making this data transparent. However, if compliance levels continue to disappoint, there may come a time when decisions regarding the release of this information may have to be made.
- *Engagement-based* modes of accountability are likely to involve a series of meetings and consultations on the appropriate future direction of WEEE. It seems that any review of WEEE must figure out

its relation to and integration with other e-waste management directives.

It should not be assumed that e-waste is a static area. Products are constantly evolving, innovations being made and policies, alongside e-waste management, are continually subject to change (as the Conclusion to this report has suggested). The immediate future of e-waste will involve a review of the WEEE directive. It seems likely that this review will take on the notion that WEEE needs to be integrated with the broad suite of e-waste management proposals and directives. In order to take on board the challenges of accountability, addressing waste management, the content of products and the design of future products (particularly in terms of their energy consumption, their recyclability and perhaps their branding as marketable eco-goods), this integration seems central. Currently WEEE appears to suffer from multiple interpretations across European member states, RoHS operates on a distinct legal basis, while the new EUP directive establishes a new framework which requires interpretation and translation for specific e-goods. Further integration of these policies requires a view on harmonisation, enforcement, compliance and ways in which producers, retailers and consumers might go beyond (or demand moves beyond) the regulations. Producing alternative means for addressing the issues highlighted under the four modes of accountability would be a useful first step in this process.

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