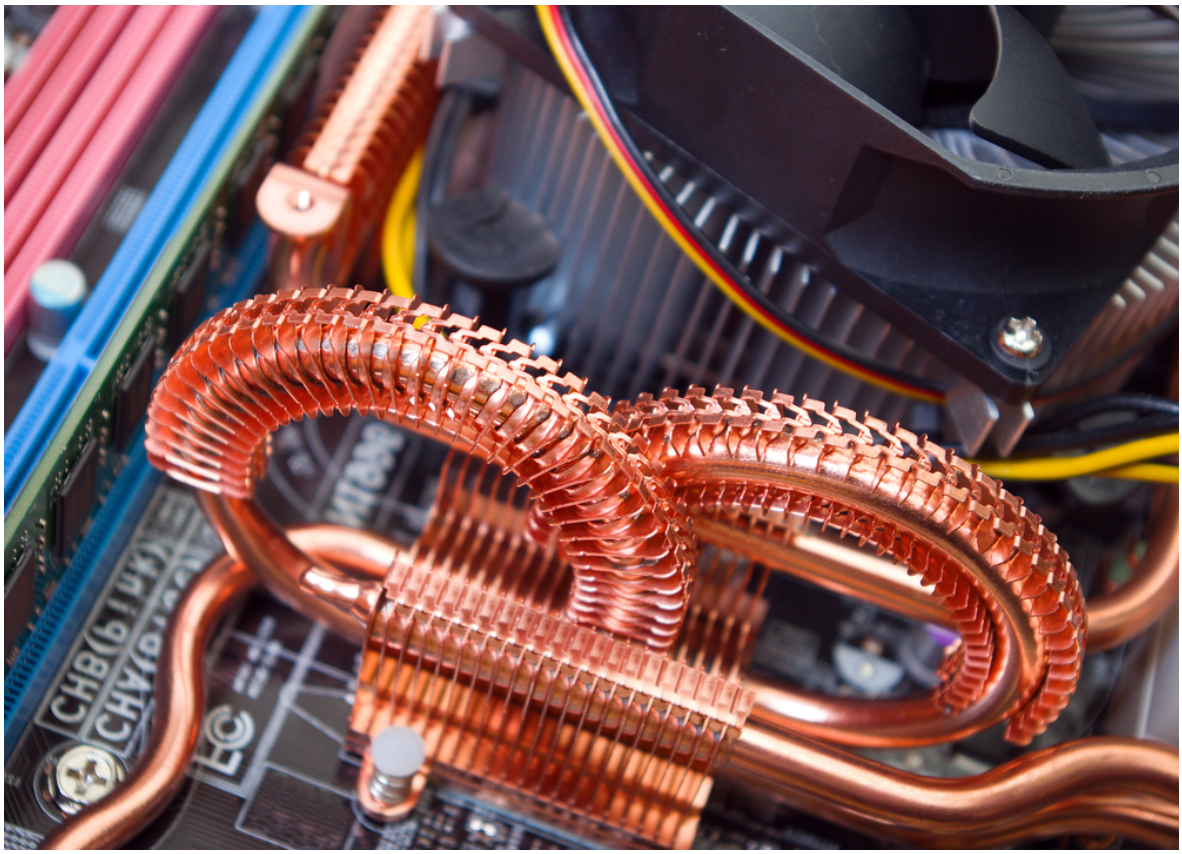
Waste Electrical and Electronic Equipment (WEEE) Regulations: Individual Producer Responsibility (IPR) in a UK context.



IPR Working Group

July 2012

Foreword

Waste Electrical and Electronic Equipment (WEEE) is one of the fastest growing waste streams, mirroring the growth in new product sales and diversity. This is driven by our reliance, in our business and personal lives, on technology, its functionality and the innovative features it can provide.

These products can contain valuable materials as well as substances that are considered to be hazardous. The European Union considers WEEE to be one their priority waste streams given its potential impact on the environment.

The present WEEE Directive, to be superseded by the recast WEEE Directive, focuses on producer responsibility as the key policy mechanism for ensuring that producers continue to bear the costs of collection, sorting or treatment and recycling or recovery.

Whilst producers must bear the responsibility for their products as an extension of the 'polluter pays principle', it is recognised in policy terms that producers should have some flexibility and discretion available to them in how they can fulfil this responsibility.

Collective producer responsibility (CPR) is an established and understood concept and practice. Individual Producer Responsibility (IPR) on the other hand still remains a policy ambition.

The IPR Working Group (WG) was set up by the WEEE Advisory Body (WAB) to examine and bring forward a policy recommendation for IPR that could work within a UK context. The role of the WAB came to an end in September 2010 and a transition plan was agreed with BIS at that time. This enabled the WG and its existing members to continue to work on this important objective with oversight from BIS as opposed to the WAB previously.

From the evidence and case studies that the WG has gathered and evaluated since setting out on its journey, there are very few IPR systems in operation that constitute full IPR as intended. This report aims to present the background and evidence on IPR in a straightforward manner and then sets out to evaluate the potential options from a UK perspective. It makes recommendations to BIS, as the sponsoring Government department for WEEE, on how an IPR system could be practically and realistically implemented in the UK.

The IPR Working Group consisted of the following members, all of whom volunteered their time freely to contribute to this process. I would like to pay special tribute to them for their commitment, contribution and determination to see this through to completion.

Members of the IPR Working Group:
Professor Margaret Bates, Environmental Science, University of Northampton;
Gary Griffiths, RDC;
Adrian Harding, Environment Agency;
Adrian Hawkes, Valpak;
Dr. Leigh Holloway, Eco3 Design Ltd;
Lucy Keal, WRAP;
Claudia Kuss-Tenzer, Waste Watch;
Terry Maguire, Computer Remarketing Services Limited;
Dr. Kirstie McIntyre, HP (represented by Mark Dempsey from time to time); and
Eddie Taylor, Lighting Industry Association.

I would also like to place on record my sincere thanks to all the experts from around the world, to the producers and to other stakeholders who generously gave their time and expertise to help us develop and deepen our understanding on this subject and the important related issues. In particular, we would like to thank Stephane Arditi, Atalay Atasu, Jaco Huisman, Jason Linnell, Reid Lifset, Federico Magalini, Kieren Mayers, Chris Van Rossem, Atsuhiko Sano and Mal Williams.

From a personal perspective, I would like to add my own personal thanks to Graeme Vickery at BIS, Alice Baverstock at Defra, to ERM (specifically Jackie Downes) and to Carter Consulting (Anthea Carter) for their incredible support, innovative ideas and for their constructive challenge in equal measure. This report would not have been possible without their involvement.

Peter Calliafas
Chair – IPR Working Group
31st July 2012

Executive Summary

The IPR Working Group (IPR WG) was set up by the Waste Electrical and Electronic Equipment (WEEE) Advisory Body to look into, examine and bring forward a policy recommendation for IPR that could practically and realistically work within a UK context. This report presents their findings.

What is IPR?

Under an Individual Producer Responsibility (IPR) system, producers are individually responsible (financially *or* financially and physically) for their own products at end of life. The allocation of individual financial responsibility to a producer for his/her own products is intended to create an economic and/or commercial incentive for producers to adapt the design of their products for easier repair, upgrading, reuse or recycling and end of life treatment. It implements the polluter pays principle with respect to their products.

Each producer does not have to have separate take-back systems within an IPR system; collective collection channels can still be used and this is an important point. The key focus is the financing mechanism. In an IPR system, the costs borne by the producer should relate to the actual costs of dealing with their own products at end of their life (EOL).

The alternative to IPR is Collective Producer Responsibility (CPR) which allocates collective financial responsibility e.g. the costs of collecting and treating mixed brand WEEE arising are shared between producers currently existing on the market, based on their current market share. Critics argue that CPR provides producers no incentive to improve the design of their products in terms of repair, upgrading, reuse or recycling as any resulting EOL cost benefits are shared between producers.

IPR within the European WEEE Directive and UK WEEE Regulations

The WEEE Directive 2002/96/EC is a producer responsibility Directive which aims to promote the reuse, recycling and recovery of WEEE in order to reduce the disposal of such wastes to landfill. The Directive requires producers (product manufacturers or importers) to become responsible for the costs of the collection, treatment, re-use and recycling of end of life products and in addition sets specific targets and treatment requirements for the recovery and recycling of WEEE.

The WEEE Directive sets different financing requirements for WEEE from private households and WEEE from 'users other than private households':

- Article 9 for WEEE from users other than private households (B2B WEEE) - the financing requirements have in built flexibility and IPR is not mandated.

- Article 8 for WEEE from private households - IPR is mandated for products put on the market after 13th August 2005 (termed 'new' WEEE). For 'new' WEEE, each producer must finance the end of life costs *relating to* the waste from his *own* products. The producer can choose to fulfil this obligation either via individual or collective take-back or treatment systems.

The UK, along with a number of other EU Member States, has not fully transposed all aspects of Article 8.2 of the original WEEE Directive. The UK WEEE Regulations currently specify a CPR model for all WEEE whereby producers pay for a proportion of mixed brand WEEE arising based on current market share. As a result, IPR is not mandated in the UK for separately collected WEEE from private households.

When examining the role of IPR within the WEEE Directive, the IPR WG recognised the wider legislative context of the Waste Framework Directive and other related legislation which affects WEEE(e.g. the RoHS Directive and the Eco-Design Directive).

Key long term goals for the UK WEEE system

In line with the key outcomes that the WEEE Directive and Article 8.2 in particular intends to achieve, the IPR WG considers that an IPR approach within the UK WEEE system should encompass the following long term goals:

- **Producers pay costs relating to their own new household WEEE in accordance with Article 8.2 of the original WEEE Directive.**
- **Provides incentives or payback for DfRR (design for easier repair, upgrading, reuse or recycling).**
- **Producers should have the option to manage their own WEEE compliance directly (with appropriate regulatory safeguards to ensure controls are applied as per PCSs).**

However, the IPR WG also recognises that it may not be possible to make the transition to 'full' IPR in one step. The introduction of IPR needs to be retrofitted onto the existing infrastructure rather than designed onto a blank canvas. Any approach must work within the framework of the recast WEEE Directive as well the definition of 'producer' (amongst other things) and must be both practical and realistic for the UK. This is in line with the IPR WG's terms of reference. Given this context, the IPR WG concluded that a strategy of evolution (through a series of interim steps) rather than revolution (in one step) is the most appropriate route to take at this point in time.

Shortlisted Options

Following an intensive review of evidence, incorporating published literature, country case studies and direct stakeholder input, the IPR WG identified a wide range of possible options. Each was evaluated and discussed by the Group, ultimately resulting in a short-list of 3 potential options for the UK which meet the strategy of evolution not revolution. These are:

- **A DfRR weighting mechanism** which applies an increase/decrease to obligated tonnages based on the current actual treatment costs and the characteristics of products being POM[1].

[1] This option was derived by the consultants, building on concepts such as the French bonus/malus system & proposals outlined in *Fair and Efficient Implementation of Product Take-Back Legislation with Collective Producer Responsibility*, L. Gui, A. Atasu, O. Ergun, B. Toktay. Georgia Tech. Working Paper, 2012.

- **Return share based on brand sampling** with the option for producers to separate out their own brand WEEE at own cost. Some states in the USA currently implement this model.

- **Front end payment for WEEE arising** – producers pay according to the current costs of collecting, treating, and recycling the sub-category of EEE being put on the market. As the amount and composition of WEEE arising will not be the same as that sold a balancing mechanism is introduced[2].

Key Principles

Bearing in mind the current political and economic climate and the need to implement an approach which is both practical and realistic, the IPR WG recommends that the following key principles are applied. The UK WEEE system should:

- **Move towards producers paying costs relating to their own WEEE** in accordance with Article 8.2 of the original WEEE Directive and in doing so also incorporate effective DfRR incentives;

- **Be based on a strategy of evolution not revolution.** The UK has an established WEEE system and infrastructure which should be modified, through a series of interim evolutionary steps, to progress towards the policy aims of IPR as set out in Article 8.2;

- **Avoid any double-payment period.** Given the current economic pressures on producers, it is advisable to avoid any mandatory double-payment period (i.e. where producers pay for WEEE arising at the same time as paying for Electrical and Electronic Equipment being put on the market (POM).

[2] This model was developed by K. Mayers, R. Lifset. K. Bodenhoefer, and L. N. Wassenhove in their paper *Implementing individual producer responsibility for Waste Electrical and Electronic Equipment through improved cost allocation,* Paper accepted for Journal of Industrial Ecology, 2012. Note the shortlisted option is version 1 of their model and does not involve future estimated cost.

Primary Recommendations

The IPR WG makes 2 primary recommendations as follows:

Recommendation 1[3]

Three options for moving towards Article 8.2 should be presented by BIS within the forthcoming stakeholder consultation on possible changes to the UK WEEE Regulations. This will enable the validity of the analysis undertaken in Section 9 to be tested and for the commercial and environmental merits of each to be properly determined.

These 3 options[4] are:

- DfRR Weighting Mechanism
- Return Share based on brand sampling
- Front End payment for WEEE arising.

By a slim majority, the IPR WG concluded that the DfRR Weighting Mechanism was the preferred option for the UK at this time but there were dissenting views. The IPR WG recommend by overall consensus that all 3 options and their commercial and environmental merits should be presented for consultation.

Recommendation 2

The UK WEEE system should fully enable and encourage producers wishing to undertake their own direct take-back activities for household WEEE whilst putting in place safeguards to ensure that the proper collection, treatment and recycling still occurs.

This is in order to (i) facilitate the move towards IPR (ii) address specific demands from producers and (iii) meet the WEEE Directive's requirement that producers are allowed to set up and operate individual and/or collective take-back systems for WEEE from private households[5].

[3] Recommendation 1 sets out the first step in a series of interim steps towards a full IPR system. An approach agreed by the IPR WG and as set out in Section 9.3
[4] See Section 9.4
[5] Article 5(2)d in the recast WEEE Directive.

Secondary Recommendations

The secondary recommendations are intended to inform both the Government and relevant authorities on other related matters that have come to the IPR WG's attention during the preparation of this report. In the main, these are of a practical nature and due consideration should be given to them because they either a) highlight potential areas of risk and/or opaqueness in the present system or b) they have an impact on the effective implementation of the Primary Recommendations as set out above.

Recommendation 3: Next Steps

The Government, through BIS should take this window of opportunity to engage with the industry and the wider sector on the recommendations arising from this report. This will ensure that a phased implementation plan can be formulated that converges, in terms of any medium term regulatory changes required, with the transposition of the recast WEEE Directive but also allows time for the development and consideration of further longer term improvements and enhancements which might be considered in future.

The Government, through BIS, should continue to have oversight of the UK's IPR policy and its effective implementation. Guidance should then be provided to the Environment Agencies by BIS to enable them to advise the PCSs of the changes required so that these changes and/or requirements can be accommodated within the present PCS operational plans. The contractual relationship between the PCS and their producer members remains unchanged. Thereafter, the Environment Agencies will still remain responsible for monitoring and effective enforcement.

Recommendation 4: On-going evaluation

The Government, through BIS should ensure that regular reviews are undertaken on the effective implementation of the UK's policy on IPR to ensure that the intended aims of the WEEE Directive are being met. To this extent, minimum review intervals of 3 years appear appropriate in the circumstances. This review process should take the opportunity to identify further evolution towards a full IPR approach taking into consideration developments in collection, treatment and recycling infrastructure, financial guarantee options, product identification (e.g. RFID tagging), policy development (e.g. Eco-Design Directive) and the nature of EEE being placed on the market and WEEE arising.

Recommendation 5[6]:

Depending on the IPR option ultimately decided upon by Government from the three set out in this report, the Government, through BIS, will need to consider what additional measures will be required in order to implement the option.

[6] The IPR Working Group recognises the Government's light touch regulatory agenda. Where specific expertise is required and this expertise is not within the relevant Government Departments, then there is a policy precedent in place for these types of specialist committees. Recommendation 5 is set within this context.

By way of an example, BIS might have to establish an arm's length advisory committee comprised of representatives from the producer community (all relevant categories and PCSs), collection and treatment industry, academia, enforcement authorities and NGOs, as applicable. A committee would need clear terms of reference to help advise the Government on an impartial basis on various aspects of implementation such as:

- In relation to the DfRR Weighting Option: the possible product differentials and the relevant percentages to be adopted as well as more general issues regarding the future policy direction of IPR.

- In relation to the Front End Payment Option: the possible WEEE sub-categories and likely return rates for these sub-categories of WEEE as well as more general issues regarding the future policy direction of IPR.

- In relation to Return Share option: the sampling methodology to be undertaken and related guidance to help inform the actual sampling process as well as potential changes to the sampling methodology.

Recommendation 6: Categorisation of UEEE and WEEE

The Government should review, as necessary, the present guidance and/or decision tree regarding the identification and categorisation of UEEE as opposed to WEEE in order to ensure that implications for all take-back systems are clear and remove any unnecessary regulatory burdens from the producers.

Recommendation 7: IAS 37

The Government should engage, through BIS with the relevant professional accountancy bodies (such as the Accounting Regulatory Committee 'ARC')[7] to make them aware of the potential challenges arising from IAS 37 and to see what amendments can be realistically accommodated without, at the same time, giving rise to any presentation risk in so far as the financial statements are concerned.

Recommendation 8: Devolved Administrations

In order to ensure that the UK can meet its obligations under the WEEE directive and that producers, PCSs and AATFs continue to benefit from a common implementation model, the Coalition Government is urged to work closely with the Devolved Administrations. Where there is a desire to have a bespoke requirement in one nation in the UK, the Governments should have regard to relative cost and benefit of the proposal and, if it goes ahead, ensure that it can be accommodated within the structure of the overall UK approach.

[7] http://ec.europa.eu/internal_market/accounting/committees/index_en.htm

Recommendation 9: Financial Resources Checks

The Government should take this opportunity to review this risk and then through BIS, determine any enhancements to the Financial Resources checks[8] to be put in place and their frequency for both the PCS schemes and for their producer members. Under guidance from BIS, the requirements for any financial resources checks can be provided for within the present operational plans as agreed between the Environment Agencies and the registered PCS schemes.

In the event that there is any doubt raised about the solvency of either a PCS or a producer member, appropriate action should be taken by the authorities to address this. This action could include by way of example, additional capital being injected into a PCS, transfer of its producer members to another scheme or in the case of the producer member, security being taken to support their guarantee commitment. Under guidance from BIS, this arrangement can be provided for within the present operational plans as agreed between the Environment Agencies and the registered PCS schemes.

The Government, through BIS, should ensure that any specific financial guarantee funds held by the PCS on behalf of its members are properly ring fenced, separately accounted for in their management accounts and/or financial statements and safeguarded from the day to day operations undertaken by the PCS via a separately designated bank account. Under guidance from BIS, this arrangement can be provided for within the present operational plans as agreed between the Environment Agencies and the registered PCS schemes.

Recommendation 10: Financial Guarantees

The Government, through BIS should take this opportunity to engage with the European Commission to determine what flexibility and/or discretion exists with the Directive for the provision of alternative financial instruments from producers (in addition to those already set out) that still provide for and meet the intended outcomes required.

Subject to this proviso, the Government, through BIS should determine the exceptional circumstances in which it will allow producers to bring forward their own alternative solutions that are convenient and appropriate to them and which are wholly acceptable to BIS. Under guidance from BIS, this arrangement can be provided for within the present operational plans as agreed between the Environment Agencies and the registered PCS schemes.

Recommendation 11: WEEE Data

The Government should take the opportunity, through BIS, to review the present data set, the way in which the data is captured and that the inadvertent classification of items of equipment is minimised so as to ensure that it can effectively manage and monitor the UK's performance as a whole.

[8] These tests could mirror those that are standard practices such as a) audited financial statements and a clean audit on the scheme operator b) turnover c) profitability d) EBITDA and e) balance sheet strength.

Recommendation 12: Enforcement

The Government, through BIS should take this opportunity to review the present enforcement regime to determine what is effective and what is not and the reasons as to why. Thereafter, it should ensure that it, the Environment Agencies (in consultation with Defra) and the VCA adopt a proactive risk based enforcement policy that targets specific parties and/or specific elements within the sector as a whole in order to promote compliance and tackle serious infringement of the regulations.

Recommendation 13: Use of voluntary agreements on DfRR

The Government should investigate, possibly through WRAP, whether there is the potential to extend the use of voluntary agreements into such areas as a) product light weighting, b) common polymers in plastics amongst others.

Recommendation 14: Dissemination of this report

The Government, through BIS should give consideration to making this report, in its entirety, a publicly available document at the earliest opportunity via a hyperlink on the BIS website.

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1 Introduction to EPR & IPR

This section introduces the concepts of Extended Producer Responsibility (EPR) and Individual Producer Responsibility (IPR).

1.1 Extended Producer Responsibility (EPR)

The term 'Extended Producer Responsibility (EPR)' was first used and defined by Lindhqvist in a report for the Swedish Ministry of the Environmental and Natural Resources in 1990. The English translation of the definition reads as follows:

> *"Extended Producer Responsibility is an environmental protection strategy to reach an environmental objective of a decreased total environmental impact from a product, by making the manufacturer of the product responsible for the entire life-cycle of the product and especially for the take-back, recycling and final disposal of the product. The Extended Producer Responsibility is implemented through administrative, economic and informative instruments. The composition of these instruments determines the precise form of the Extended Producer Responsibility."*[1]

Key to EPR is the allocation of responsibilities, to whom (e.g. producers, local authorities, consumers) and how (e.g. collectively or individually). Responsibilities are categorised by Lindhqvist[2] as liability, economic (financial) responsibility, physical responsibility, informative responsibility and ownership. These are further described as follows[3]:

- Liability refers to a responsibility for proven environmental damages caused by the product in question. The extent of the liability is determined by legislation and may embrace different parts of the life-cycle of the product, including usage and final disposal;

- Economic (financial) responsibility means that the producer will cover all or part of the costs for e.g. the collection, recycling or final disposal of the products at end of life. These costs could be paid for directly by the producer or by a special fee;

- Physical responsibility is used to characterise the systems where the manufacturer is involved in the actual physical management of the products or of the effects of the products;

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[1] Lindhqvist, Thomas. Extended Producer Responsibility, 1992. In Lindhqvist, T., Extended Producer Responsibility as a Strategy to Promote Cleaner Products (1-5). Lund: Department of Industrial Environmental Economics, Lund University.
[2] Ibid.
[3] Lindhqvist, Thomas. 1998. What is Extended Producer Responsibility? In: Extended Producer Responsibility as a Policy Instrument – what is the Knowledge in the Scientific Community? Swedish Environmental Protection Agency.

- Informative responsibility requires the producer to supply information on the environmental properties of their products.

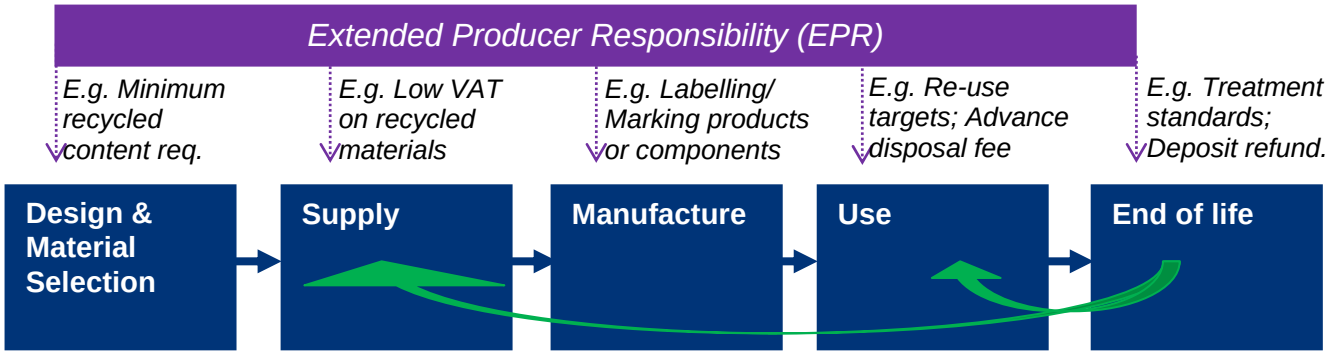
- Ownership - the manufacturer may also retain the ownership of his products throughout their life cycle (e.g. product service provision via a lease system) and consequently also be linked to the environmental problems of the product.

The emergence of the concept of EPR reflected several general trends in environmental policy development at that time. Most notably, the prioritisation of preventative measures over end-of-pipe approaches, enhancement of life cycle thinking and a shift from the so-called command-and-control approach to a non-prescriptive, goal-oriented approach. EPR reflects these trends via two fundamental features[4]:

1) Making producers more responsible for the entire life cycle of their products. A principal rationale for allocating responsibility to producers is their capacity to make changes at source (i.e. at the design phase) in order to reduce the environmental impacts of their product throughout its life cycle;

2) Allowing implementation via a range of policy tools and instruments in different combinations e.g. to provide both 'carrot' and 'stick'. EPR aims to incentivise industry to continuously improve their products and processes in terms of minimising environmental impact.

Figure 1.1: EPR – examples of policy tools & instruments across the product lifecycle.



Further studies on EPR, for example by the OECD, narrowed the scope to focus exclusively on the end of life phase. The OECD defines EPR as "*an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle*"[5]. Under EPR, "*producers accept significant responsibility (financial and/or physical) for the treatment or disposal of post-consumer products*"[6].

[4] Extended Producer Responsibility as a driver for design change: Utopia or reality? N. Tojo, IIIEE, 2004
[5] Extended Producer Responsibility: A Guidance Manual for Governments, OECD, 2001
[6] Ibid.

EPR sets the context within which Individual Producer Responsibility (IPR) was subsequently developed. As the diagram above illustrates, EPR can be made up of multiple policy instruments acting at each stage of the product lifecycle. In contrast, IPR is a more specific policy tool, as explained in Section 1.2.

1.2 Individual Producer Responsibility (IPR)

There is no single accepted definition of Individual Producer Responsibility (IPR) but at its essence IPR means that producers are made individually responsible (financially *or* financially and physically) for their own products at end of life. In addition to implementing general producer responsibility, the theory behind IPR is to establish an economic incentive for producers to adapt the design of their products for easier repair, upgrading, reuse or recycling (DfRR) which should in turn lead to reduced environmental impact at end of life (EOL)[7]. The intention is that if a product has been designed to reduce its EOL impacts and this results in lower EOL costs, this cost reduction is passed back to the individual producer who made the DfRR investment, thus providing a payback mechanism.

The alternative to IPR is Collective Producer Responsibility (CPR) which, as the name suggests, is a mechanism for producers to meet their responsibilities (financial *or* financial and physical) collectively as groups of producers. The most typical example is where the costs of collecting and treating mixed brand WEEE (Waste Electrical and Electronic Equipment) arising are shared between producers currently existing on the market, based on their current market share. Critics argue that CPR gives producers no incentive to improve the design of their products in terms of repair, upgrading, reuse or recycling as any resulting EOL cost benefits are shared between producers.

It is important to differentiate between IPR, CPR and the physical process of product take-back. IPR and CPR can both be applied purely as financial responsibility - the responsibility does not have to be physical. So, for example:

- An individual take-back or recycling system managed by only one producer does not necessarily equate to IPR. Such a system could operate under IPR or CPR financing mechanisms.

- A collective take-back or recycling system organised by several producers working together to manage WEEE does not necessarily equate to CPR. Such a system could operate under IPR or CPR financing mechanisms.

This means that a producer can be made individually financially responsible for their own products at end of life but can fulfil this via a collective collection system. Each producer does not have to have separate take-back systems within an IPR system. The key issue is how the financing mechanism allocates costs between producers. In an IPR system, the costs borne by the producer should relate to the costs of dealing with that producer's own products at end of life.

[7] When divided over product lifetime.

1.3 Summary

Under an Individual Producer Responsibility (IPR) system, producers are made individually responsible (financially *or* financially and physically) for their own products at end of life. The allocation of individual financial responsibility to a producer for his/her own products is intended to create an economic incentive for producers to adapt the design of their products for easier repair, upgrading, reuse or recycling and end of life treatment. It implements the polluter pays principle with respect to products.

Each producer does not have to have separate take-back systems within an IPR system; collective collection channels can still be used. The key issue is how the financing mechanism allocates costs between producers. In an IPR system, the costs borne by the producer should relate to the costs of dealing with that producer's own products at end of life.

The alternative is Collective Producer Responsibility (CPR) which allocates collective financial responsibility e.g. the costs of collecting and treating mixed brand WEEE arising are shared between producers currently existing on the market, based on their current market share. Critics argue that CPR gives producers no incentive to improve the design of their products in terms of repair, upgrading, reuse or recycling as any resulting EOL cost benefits are shared between producers.

Section 2.1 discusses the application of IPR and CPR within the European Directive on Waste Electrical and Electronic Equipment ('the WEEE Directive').

2 The WEEE Directive

This section provides an overview of the Waste Electrical and Electronic Equipment Directive 2002/96/EC and the application of IPR and CPR within the legislation, both at European and UK level.

2.1 The WEEE Directive 2002/96/EC

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC is a producer responsibility Directive which aims to promote the reuse, recycling and recovery of WEEE in order to reduce the disposal of such wastes to landfill. The Directive requires producers (e.g. product manufacturers or importers[8]) to become responsible for the costs of the collection, treatment, recovery and disposal of end of life products[9] and in addition sets specific targets and treatment requirements for the recovery and recycling of WEEE.

The existing Directive has been in force since February 2003. Proposals for a recast were issued by the European Commission in December 2008 and the final version of the revised Directive (2012/19/EU) was published in the Official Journal (OJ) on 24th July 2012[10]. Member States have until 14 February 2014 to transpose its requirements into their domestic legislation. Throughout this report, Article numbers and legal text are taken from the original WEEE Directive 2002/96/EC unless otherwise specified.

Financing requirements within the WEEE Directive: IPR and CPR

> "*I am particularly happy we could convince Member States to strengthen the individual responsibility of producers for the waste from their products. This will be an important incentive for producers to take environmental consequences into account already when they stand around the design table*"
>
> M. Wallstrom, October 2002,European Commission Press Release

The WEEE Directive sets different financing requirements for WEEE from private households (*Article 8*) and WEEE from 'users other than private households' (*Article 9*):

- For WEEE from users other than private households (B2B WEEE) the financing requirements have in built flexibility and IPR is not mandated.

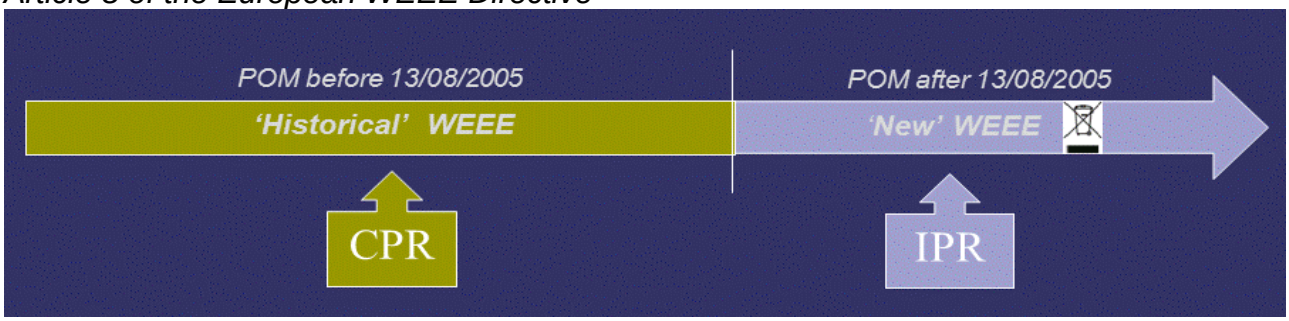
[8] The definition of 'Producer' under the WEEE Directive covers those who: (i) manufacture and sell EEE on 'own brand' basis (ii) resell EEE manufactured by others under its 'own brand' (iii) imports or exports EEE into a MS on a professional basis. This is the definition of producer used from here on within this report.
[9] Producers should finance at least the collection from collection facilities, and the treatment, recovery and disposal of WEEE.
[10] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:197:0038:0071:EN:PDF

- For WEEE from private households IPR is mandated for products put on the market after 13th August 2005.

As a result, this report is focused on how to apply IPR to WEEE from private households, whilst being mindful of any implications for B2B WEEE.

Article 8 of the WEEE Directive distinguishes between 'new' and 'historic' WEEE from private households.

Figure 2.1: Financing Requirements for WEEE from Private Households as established by Article 8 of the European WEEE Directive



The Directive states that producers should be collectively responsible for financing historic WEEE i.e. waste arising from products put on the market (POM) before 13th August 2005. The rationale being that (a) it is not possible for producers to influence the design of products that have already been produced and (b) individual responsibility should not be applied retrospectively. The Directive therefore established Collective Producer Responsibility (CPR) for historic WEEE, for example based on current market share.

Financing WEEE from Private Households: 'Historic' WEEE

Article 8.3

The responsibility for the financing of the costs of the management of WEEE from products put on the market before [13/08/2005] … (historical waste) shall be provided by one or more systems to which all producers, existing on the market when the respective costs occur, contribute proportionately, e.g. in proportion to their respective share of the market by type of equipment.

For 'new' WEEE, the rationale was that design changes could make future products easier to disassemble, more recyclable and reduce their environmental impact. Therefore *Article 8.2* of the WEEE Directive established Individual Producer Responsibility (IPR) for 'new' WEEE (products POM on or after 13th August 2005), obliging producers to finance the costs relating to their own products.

Financing WEEE from Private Households: 'New' WEEE

Article 8.2

For products put on the market later than 13 August 2005, each producer shall be responsible for financing [at least the collection, treatment, recovery and environmentally sound disposal of WEEE from private households deposited at collection facilities] relating to the waste from his own products. The producer can choose to fulfil this obligation either individually or by joining a collective scheme.

Member States shall ensure that each producer provides a guarantee when placing a product on the market showing that the management of all WEEE will be financed and that producers clearly mark their products in accordance with Article 11(2). This guarantee shall ensure that the operations referred to in paragraph 1 relating to this product will be financed. The guarantee may take the form of participation by the producer in appropriate schemes for the financing of the management of WEEE, a recycling insurance or a blocked bank account.

Article 8.2 can be fulfilled by:

- setting up an individual system e.g. whereby the producer establishes its own system for returning their products for re-use/ recycling/ recovery; or
- a collective system organised by multiple producers working together but with a mechanism whereby each producer finances the costs relating to the collection, treatment, re-use, recycling and recovery of their own products.

Producers have a choice between establishing individual or collective take-back systems.

As Article 8(2) allocates individual financial responsibility for 'new' WEEE, it indicates that producers are not obliged to pay for costs relating to other producers' WEEE e.g. in the case of orphan products (belonging to producers that have gone out of business or withdrawn from the market) or free riders (products from producers who are evading compliance). To ensure that orphan products are covered, an additional requirement for financial guarantees is mandated. This is discussed in more detail in Section 6.8.

The WEEE recast text makes no changes to the existing *Article 8* requirements on financing WEEE from private households. It does add an additional clause (Article 12(6)) which states "The Commission is invited to report, by 14 August 2015, on the possibility of developing criteria to incorporate the real end-of-life costs into the financing of WEEE by producers, and to submit a legislative proposal to the European Parliament and the Council if appropriate".

Eco-design requirements within the WEEE Directive

The WEEE Directive explicitly refers to its use of IPR as a driver for encouraging DfRR (Design for Re-use, Repair, Upgrade and/or Recycling):

WEEE Directive Preamble

(12) "*The establishment, by this Directive, of producer responsibility is one of the means of encouraging design and production of EEE which take into full account and facilitate its repair, possible upgrading, re-use, disassembly and recycling*"

(20) "*In order to give maximum effect to the concept of producer responsibility, each producer should be responsible for financing the management of the waste from his own products.*" [11]

However, other DfRR-related elements within the original WEEE Directive are generally restricted to broad principles and statements of encouragement, rather than specific requirements:

- Paragraph (18) in the preamble reiterates the waste hierarchy – where appropriate priority should be given to re-use of WEEE and its components over recycling and recovery;

- Paragraph (18) also states that "*producers should be encouraged to integrate recycled material in new equipment*";

- Article 4 on Product Design – Member States (MS) should "*encourage the design and production of electrical and electronic equipment which take into account and facilitate dismantling and recovery, in particular the reuse and recycling of WEEE, their components and materials. In this context, Member States shall take appropriate measures so that producers do not prevent, through specific design features or manufacturing processes, WEEE from being reused* …"[12].

These statements of encouragement appear to have had little direct impact or uptake within Member State legislation. The text of the recast WEEE Directive maintains the same broad principles and statements on DfRR as the original Directive, but also potentially introduces some additional DfRR-related elements as follows:

- Preamble (11) "*Ecodesign requirements facilitating the re-use, dismantling and recovery of WEEE should be laid down in the framework of measures implementing Directive 2009/125/EC. In order to optimise re-use and recovery through product design, the whole life cycle of the product should be taken into account.*"[13];

- Preamble (23) "*Collective schemes could provide for differentiated fees based on how easily products and the valuable secondary raw materials they contain could be recycled*";

[11] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2002L0096:20080321:EN:PDF
[12] *Ibid.*
[13] See Section 1.3 for further discussion of the Eco-Design Directive

- Article 11(6) " the Commission will examine the possibility of setting separate targets for WEEE to be prepared for re-use";

- Article 4 "Member States shall take appropriate measures so that the eco-design requirements facilitating re-use and treatment of WEEE established in the framework of Directive 2009/125/EC are applied ".

Other key requirements within the WEEE Directive

Other key elements of the WEEE Directive which need to be taken into consideration when examining possible IPR systems are listed below. Each of these is discussed in detail in Chapter 2.3.

- Product Scope
- Product and Collection Categories
- Collection Targets
- Historic versus New WEEE
- Definition of Producer
- Producer marking & Brand identification
- Financial Guarantees
- Accruals

2.2 Article 8.2 of the WEEE Directive: transposition in other EU Member States

The transposition of *Article 8.2* of the WEEE Directive, which mandates IPR for new WEEE from private households, has not been straightforward. A review undertaken by Okopol et al in a study for the European Commission in 2007 found that only a minority of Member States had clearly stipulated individual financing for new WEEE within their national regulations:

Table 2.1: Transposition of Article 8.2 of the WEEE Directive by EU Member States[14]

EU Member State	Transposition of Article 8.2
Belgium (Brussels, Flanders) Cyprus Czech Republic Estonia Luxembourg Malta Netherlands Romania Slovakia	**Pattern 1: Financing the management of waste from their own products for new WEEE** The legal text clearly distinguishes that producers are required to finance the waste from their own products placed on the market after 13 August 2005.
Austria Belgium (Wallonia) Germany Hungary Ireland Italy Lithuania Poland Portugal Spain Sweden	**Pattern 2: Variations of 8(2) or Ambiguous Interpretation** The following countries have not formulated their legal text in such a way that an explicit individual financial responsibility is assigned. That is, in many cases producers responsibilities for products placed on the market after 13 August 2005 are mentioned in the plural form which makes for an ambiguous interpretation that producers in general are responsible for financing waste from their products. There are other variations of Article 8(2), such as in the case of Germany and Austria, where producers are given the choice to decide whether or not they are individually or collectively responsible financially for products placed on the market after 13 August 2006. Additionally, in the case of Ireland, producers that are members of an 'approved body' are exempt from Article 16 on financing WEEE from private households which clearly assigns an individual financial responsibility for new WEEE.
Bulgaria Denmark Finland France[15]	**Pattern 3: Individual Financial Responsibility for New WEEE missed** MS have transposed Article 8(2) in such a way that for new WEEE the provision that producers should be individually

[14] Directly from '*Transposition of The Producer Responsibility Principle of the WEEE Directive, August 2007, Okopol, IIIEE and RPA*' and represents the views of those authors. A similar review was undertaken by the industry-NGO coalition IPR Works also in 2007 and reached similar results, see page 15 in '*Individual Producer Responsibility: a review of practical approaches to implementing individual producer responsibility for the WEEE Directive'*, http://www.insead.edu/facultyresearch/research/doc.cfm?did=45054

EU Member State	Transposition of Article 8.2
Greece Latvia Slovenia UK	responsible for the waste from their own products appears to be ignored. In many of the countries listed, allocation of financial responsibility for new WEEE is to be determined by current market share when costs are incurred, as in the historical WEEE financing mechanism.

In addition, when referring to the overall transposition of the producer responsibility principle by Member States, the Okopol report highlights that "*there are differences in what is happening in practice compared to what the legal text suggests*". For this reason, it is beneficial to conduct detailed case studies on specific countries in order to identify both the current legal context and practical implementation. To our knowledge, there has been no updated analysis of how MS have transposed *Article 8.2* within their national legislation since the Okopol report[16]. A full review of all Member States national legislation was not feasible within the context of the IPR Working Group, however, detailed case studies on France, Germany and Sweden were conducted and can be viewed in Annex A.

2.3 The UK WEEE Regulations

The UK Waste Electrical and Electronic Equipment (WEEE) Regulations 2006 [17] (as amended) implement the main provisions of the original European WEEE Directive. The main requirements and obligations on producers and distributors of EEE came into effect in the UK from 1 July 2007.

Following the recast at European level, the UK will be required to transpose the new WEEE Directive within 18 months of its publication in the Official Journal (OJ). To inform this process, the UK Government plans to undertake a consultation process in late 2012.

IPR within the context of the UK WEEE Regulations

The UK, along with a number of other EU Member States, has not fully transposed all aspects of *Article 8.2* of the original WEEE Directive. As a result, IPR is not currently mandated in the UK for WEEE from private households.

The current UK system for household WEEE is based on Collective Producer Responsibility (CPR). All producers, existing on the market when the respective costs occur, collectively fund the costs of treating and recycling all separately collected WEEE

[15] Note that subsequent to this analysis which was published in 2007, changes have been made to the French system as described in Annex A.
[16] In November 2007, the European Commission commented on the lack of conformity with Article 8.2 of the WEEE Directive by some Member States but no further action was taken to our knowledge. See statement by Mr Dimas at: http://www.europarl.europa.eu/sides/getAllAnswers.do?reference=P-2007-4971&language=EN
[17] Further information on the UK WEEE Regulations can be found here: http://www.bis.gov.uk/weee

from private households and these costs are allocated to producers based on current market share. These requirements are set out in *Part 3*, *Article 8* of the UK Regulations:

> The amount of the relevant WEEE for which each producer shall be responsible … shall be calculated in relation to each of the categories of EEE as follows,
>
> **(A ÷ B) x C**
>
> *Where:*
>
> 'A' is the total amount in tonnes of EEE intended for use by private households and falling within one of the categories of EEE that has been put on the market in the UK by that producer in a particular compliance period;
>
> 'B' is the total amount in tonnes of EEE intended for use by private households and falling within the relevant category that has been put on the market in the UK by all producers in the same compliance period used in 'A'; and
>
> 'C' is the total amount in tonnes of WEEE from private households which is waste from electrical or electronic products that fall within the relevant category and is deposited at a designated collection facility and returned under regulation 32 in the same compliance period used in 'A'.

To give a worked example using theoretical values:

- Producer R puts 10 tonnes of small household appliances (SHA) on the UK market, Producer S 30 tonnes of SHA and Producer T 60 tonnes of SHA. A total of 100 tonnes of SHA was therefore put on the UK market during the compliance period.
- Over the same compliance period, 50 tonnes of SHA WEEE arising is separately collected from the UK market. So:
    - Producer R must pay for 5 tonnes of SHA WEEE arising [(10÷100) x 50 = 5];
    - Producer S must pay for 15 tonnes of SHA WEEE arising [(30÷100) x 50 = 15]; and
    - Producer T must pay for 30 tonnes of SHA WEEE arising [(60÷100) x 50 = 30].

The Current UK WEEE system

The current UK WEEE system is characterised by the following elements:

- Producers must join a Producer Compliance Scheme (PCS), this is a mandatory requirement. (It is possible for a producer to set up his own scheme so long as he is able to meet the legal requirements placed on a PCS). Approximately 34 PCSs

covering WEEE from private households are currently approved in the UK[18] and producers are free to select which PCS to join. Producers also have the option of establishing their own PCS which can be just for them or open to other producers too;

- The PCSs register their Producer members with the UK authorities, report tonnage data on EEE put on the UK market, arrange the financing of any costs of collection, treatment, recovery and disposal of WEEE in line with their notified obligation and declare this, supported by evidence, to the appropriate authorities;

- Only Approved Authorised Treatment Facilities (AATFs) are able to issue evidence of WEEE treatment and recovery. This evidence is required by PCSs to offset their members' producer obligations and is facilitated via the WEEE Settlement Centre[19]. The trading of evidence between PCSs has been an issue of significant controversy. According to a report commissioned by HP, there was "*ransom' price profiteering in 2007*" and although these extremes have now been reduced the price paid by producers for evidence still "*relates primarily to perceived trading values rather than actual costs*".[20]

- Producers can undertake their own take-back activities but must have the collected WEEE treated by an AATF and the evidence notes issued to their PCS. The PCS can then discount the volumes from this member's obligation and may charge an administration fee for doing so. All producers, even those undertaking their own take-back activities, must be a member of a PCS or set up their own PCS.

- Consumers have the ability to deposit WEEE at specific civic amenity (CA) sites and other locations across the UK free of charge. These are termed Designated Collection Facilities (DCFs). There may also be further collection facilities available locally. Local authorities generally offer a pre-bookable service for the collection of bulky WEEE (e.g. LDA) from householders at a fee.

- Distributors (e.g. retailers) are required to provide a take-back service to householders enabling them to return their WEEE free of charge. However, the UK WEEE Regulations allow distributors to offer 'in-store' take-back, participate in the nationwide Distributor Take-back Scheme (DTS) (which helps to fund the national network of Designated Collection Facilities (DCFs)) or provide an alternative system for free take-back of WEEE from householders. In other words, physical in-store take-back is not currently mandatory although it is the default requirement.

- Producers are required to report the weight of EEE placed on the UK market using the 13 EEE categories. These are the 10 set out in the WEEE Directive, namely: Large household appliances; Small household appliances; IT & Telecomms equipment; Consumer equipment; Lighting equipment; Electrical & Electronic Tools; Toys, Leisure

[18] For 2012, the following number of PCSs covering WEEE from private households were approved by: the Environment Agency (26), the Scottish Environment Protection Agency (6) and the Northern Ireland Environment Agency (2). For a full list please see: http://www.environment-agency.gov.uk/static/documents/Business/Approved_WEEE_Compliance_Schemes_-_2012.pdf

[19] https://www.weee-sc.org.uk/default.aspx

[20] 'Cost impact of WEEE evidence trading', 2012, Project Report for Hewlett Packard by 360 Environmental

& Sports equipment; Medical Devices; Monitoring & Control Instruments; Automatic Dispensers plus an additional 3 sub-categories which include some items that are classed as hazardous and some which are not. These sub-categories are display equipment, cooling appliances and gas discharge lamps. This gives a total of 13 reporting categories in the UK. In contrast, WEEE is usually collected at DCFs in 5 collection categories: Cold (e.g. refrigerators, air conditioning units), Display (e.g. TVs, monitors), LDA (Large Domestic Appliances e.g. washing machines), Mixed WEEE, and Gas Discharge Lamps)

2.4 Summary

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC is a producer responsibility Directive which aims to promote the reuse, recycling and recovery of WEEE in order to reduce the disposal of such wastes to landfill. The Directive requires producers (product manufacturers or importers) to become responsible for the costs of the collection, treatment, re-use and recycling of end of life products and in addition sets specific targets and treatment requirements for the recovery and recycling of WEEE.

The WEEE Directive sets different financing requirements for WEEE from private households and WEEE from 'users other than private households':

- Article 9 for WEEE from users other than private households (B2B WEEE) - the financing requirements have in-built flexibility and IPR is not mandated.

- Article 8 for WEEE from private households - IPR is mandated for products put on the market after 13th August 2005 (termed 'new' WEEE). For 'new' WEEE, each producer must finance the end of life costs relating to the waste from his own products. The producer can choose to fulfil this obligation either via individual or collective take-back or treatment systems.

The UK, along with a number of other EU Member States, has not fully transposed all aspects of *Article 8.2* of the original WEEE Directive. The UK WEEE Regulations currently specify a CPR model for all household WEEE whereby producers pay for a proportion of mixed brand WEEE arising based on current market share. As a result, IPR is not fully enabled in the UK as a practical compliance option for WEEE from private households.

3 Wider Legislative Context

When examining the role of IPR within the European WEEE Directive, it is helpful to be aware of:

(a) the high level context set by the Waste Framework Directive;

(b) other legislation which affects the impact of electrical and electronic equipment at end of life e.g. RoHS, Eco-Design Directive.

3.1 Waste Framework Directive 2008/98/EC

The revised Waste Framework Directive (2008/98/EC) lays down the EU-wide definition of waste, provides for a European Waste List, and introduces the need to consider life cycle thinking when applying the waste hierarchy in terms of management of specific waste streams.

This revised Directive also includes, for the first time, the concept of EPR. *Article 8* of the Directive allows Member States to take legislative or non-legislative measures to ensure extended producer responsibility.

Any such measures may encourage design to reduce the environmental impact and generation of waste. The text also refers to measures which may encourage designing products which are technically durable, suitable for multiple use and the proper and safe recovery at point of disposal. Any such measures must not prejudice existing product specific legislation (e.g. the WEEE Directive).

The preamble of the Directive also refers to the Commission being able to adopt guidelines to specify in certain cases when objects become waste and refers specifically to electrical and electronic products in this context.

3.2 Eco-Design Directive 2009/125/EC

The EuP Directive 2005/32/EC established a framework for setting eco-design requirements for energy-using products[21]. It was recast in 2009 as the Eco-Design Directive (2009/125/EC) and its scope widened to include other energy related products[22]. It aims to improve the environmental performance of products throughout their life-cycle via the integration of environmental aspects within the product design phase. The original EuP Directive was transposed into UK law under Statutory Instrument (SI 2007 No:2037)

[21] Energy-using products (EuPs), which use, generate, transfer or measure energy (electricity, gas, fossil fuel), such as boilers, computers, televisions, transformers, industrial fans, industrial furnaces etc.
[22] Energy-related products (ERPs) which do not use energy but have an impact on energy use e.g. windows, insulation material, shower heads etc.

and came into force on 11 August 2007. The recast Eco-Design Directive was transposed by Statutory Instrument (SI 210 No: 2617) which came into force on 20 November 2010.

Eco-Design Directive 2009/125/EC

(13) "Considering at the design stage a product's environmental impact throughout its whole life cycle has a high potential to facilitate improved environmental performance in a cost effective way, including in terms of resource and material efficiency"

(14) "Although a comprehensive approach to environmental performance is desirable, greenhouse gas mitigation through increased energy efficiency should be considered a priority environmental goal"

Specific eco-design requirements are set via implementing measures (IMs) usually targeting specific products or groups of products but they may also include horizontal measures such as standards of performance for standby modes of operation. To date, IMs have taken the form of EU Regulations and as such are directly applicable in the UK and all other Member States without the need for transposition at the Member State level. However, other forms are possible, including voluntary agreements.

Article 15 of the Directive sets out the criteria under which an IM can be adopted. Its scope potentially enables eco-design requirements to be set for any life-cycle impact (including end of life), the two main factors being that the product shall:

a) have a significant environmental impact within the Community, as specified in the Community strategic priorities as set out in Decision No 1600/2002/EC[23]; and

b) the product shall present significant potential for improvement in terms of its environmental impact without entailing excessive costs.

However, *Article 16* subsequently states that the first 3-year working plan, setting out an indicative list of product groups which are considered as priorities for the adoption of IMs, should focus on standby losses and products with a high potential for cost-effective reduction of greenhouse gas emissions. As a result, the Regulations[24] adopted so far have focused primarily on energy use and there have been no implementing measures covering end of life impacts, with the possible exceptions of non-directional lighting which

[23] Decision No 1600/2002/EC laying down The Sixth Community Environment Action Programme sets environmental priorities in the following 4 areas: climate change, nature and biodiversity, environment and health and quality of life, natural resources and wastes.

[24] To date, 13 Eco-Design Regulations have been adopted under Directive 2009/125/EC. These cover Electrical and electronic household and office equipment, External power supply units, Simple set top boxes, Non directional lighting, Tertiary lighting, Household refrigerating appliances, Electric motors, Glandless circulators, Fans, Air conditioners, Televisions, Household washing machines and Household dishwashers. They variously set requirements on power consumption, energy efficiency and provision of consumer information.

includes lamp lifetime (i.e. product durability) and tertiary lighting which includes lamp survival amongst the functionality requirements.

It is possible that this may change in future given new stimulus from the recast WEEE Directive which states that "*Ecodesign requirements facilitating the re-use, dismantling and recovery of WEEE should […] be laid down in the framework of measures implementing Directive 2009/125/EC.*"

3.3 RoHS Directive 2002/95/EC & 2011/65/EU

Directive 2002/95/EC on the Restriction of the use of Hazardous Substances in electrical and electronic equipment (RoHS 1) came into force in February 2003. It sets strict limit values for the presence of lead, mercury, cadmium, hexavalent chromium and the flame retardants polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) in most categories of electrical and electronic equipment covered by the WEEE Directive. A specified list of exemptions enables continued use of these substances in applications where no satisfactory alternative is available.

According to the European Commission, "*The [RoHS] legislation has prevented thousands of tonnes of banned substances from being disposed of and potentially released into the environment. It has led to important changes in product design in the European Union and worldwide, and has also served as a model for similar laws outside the European Economic Area.*"[25]

The original RoHS Directive will be repealed on 3 January 2013 and replaced by the new RoHS Directive 2011/65/EU (known as RoHS 2). Key features of the RoHS recast are an expansion of scope to cover all electrical and electronic equipment (EEE), cables and spare parts, with a view to full compliance by 2019 and a review of the list of banned substances by July 2014, and periodically thereafter. The RoHS Recast Directive was published in the Official Journal on 1 July 2011.

3.4 Landfill Tax

Landfill Tax is payable on waste that is disposed of at landfills. It aims to encourage waste producers to produce less waste and to recover more value from waste e.g. via recycling. Landfill Tax applies to all waste disposed of at a licensed landfill site on or after 1 October 1996 unless the waste is specifically exempt. The tax is charged by weight and there are two rates: (i) active waste (ii) inert or inactive waste. The Tax is regulated by HM Revenue and Customs.

Rates for 2012/13 are:

Active waste - £64/tonne (+VAT)

[25] European Commission press release, Fewer risks from hazardous substances in electrical and electronic equipment, 20/07/2011.

Inert waste - £2.50/tonne (+VAT)

The Government announced in the Budget 2010 that the rate for active waste will continue to escalate by £8 per year until at least 2014/15, when it will reach £80 per tonne. There will be a floor under the active waste rate, so that the rate will not fall below £80 per tonne from 2014-15 to 2019-20[26].

3.5 Conclusions

When examining the role of IPR within the WEEE Directive, it is helpful to be aware of (a) the high level context set by the Waste Framework Directive and (b) other legislation which affects the impact of electrical and electronic equipment at end of life e.g. the RoHS Directive and the Eco-Design Directive.

The RoHS Directive has mandated significant reductions in the use of the specified 6 substances within EEE with resulting impacts on end of life treatment. In comparison, although there is scope within the framework of the Eco-Design Directive 2009/125/EC to address end of life (EOL) environmental impacts, to date it has focused on setting minimum requirements for energy consumption and energy efficiency. However, its application to EOL impacts could be given new stimulus from the recast WEEE Directive which states that "*Ecodesign requirements facilitating the re-use, dismantling and recovery of WEEE should be laid down in the framework of measures implementing Directive 2009/125/EC.*"

Sector experts are divided in their opinions on the policy interactions between IPR, the Eco-Design Directive and the RoHS Directive in Europe. Some believe that incorporating IPR within the WEEE Directive in order to try to incentivise and achieve DfRR goals is ineffectual and inefficient[27]. They propose instead that the RoHS Directive and Eco-Design Directive should be the primary tools for mandating DfRR changes in those cases where sufficient environmental benefits can be demonstrated. Conversely, others see these 3 key pieces of European legislation for EEE as working together in a complementary approach to achieve DfRR improvements. In this scenario, IPR is the 'pull' or 'carrot' for early adopters and RoHS/Eco-Design the 'push' or 'stick' to eventually level the playing field as follows:

- In cases where DfRR changes are justified (i.e. result in significant environmental benefits from a life cycle perspective) and achievable, the RoHS and Eco-Design Directives can be used to mandate minimum standards and raise the baseline performance of EEE on the EU market;

- IPR is then used within the WEEE Directive to reward producers for DfRR changes and to incentivise markets to adopt DfRR changes which due to technology, cost, supply availability or other reasons cannot be mandated for all products on the market.

[26] Notice LFT1, A General Guide to Landfill Tax, HMRC, April 2011
http://customs.hmrc.gov.uk/channelsPortalWebApp/downloadFile?contentID=HMCE_CL_000509

4 Evidence Review

This section summaries the approach taken by the IPR Working Group to review existing evidence and case studies on IPR.

4.1 The Review Process

The IPR Working Group's Terms of Reference state that the objectives of the Group are to:

1. *Seek and obtain evidence (including relevant case studies) from a wide range of external stakeholders, including IPR experts about IPR systems and how they currently operate across the world.*

2. *Review the evidence (including any case studies) for IPR and consider how a system could work within the UK, to help meet Article 8.2 of the WEEE Directive.*

3. *Bring forward recommendations for how IPR could be practically, realistically and fairly implemented in the UK.*

To fulfil the first two objectives, the following activities were undertaken:

1. Evidence and opinions were gathered from Sector Experts via structured interviews (primarily phone or face to face) and from Stakeholders via written questionnaires;

2. A desk based review of relevant literature covering: Country Case Studies, Academic Papers, Industry and NGO Reports, EU and UK Legislation.

Interviews with Sector Experts and Stakeholder Questionnaires

Beginning in 2010, structured interviews (primarily phone or face to face) were held with sector experts and written questionnaires were sent to producers and other stakeholders.

The objective was to compile opinions and evidence by asking structured questions under the following key themes.

- To investigate the commercial and environmental benefits of implementing IPR;

- To identify the potential systems available to achieve IPR together with their advantages and disadvantages;

- To identify what additional policy and/or regulatory measures and/or economic measures and/or mechanisms will be required to underpin IPR adoption in the UK;

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[27] This is discussed in more detail in Section 7.

- To identify any operational issues that may arise if IPR was implemented in the UK.

A further round of stakeholder questionnaires was undertaken in early 2012.

The IPR WG would like to thank all stakeholders who provided input, which was invaluable in building this report.

Desk Based Review

A desk based review of relevant literature was undertaken which examined: Country Case Studies, Academic Papers, Industry and NGO Reports, EU and UK Legislation.

The review process identified and assessed the key themes and challenges which frequently arise in the IPR debate.

A number of countries or regions with experience of IPR type systems were identified for further research. The IPR working Group looked in detail at: France, Germany, Austria and Sweden (see Annex A). Relevant information on experiences in the Netherlands, Japan and the US States of Maine and Washington were also examined and are presented in Section 5.

4.2 Key Studies and Initiatives

There are a number of key research papers and reports on IPR. These examine the complexities involved in implementing IPR and provide fuller details of country case studies than can be provided in this report. They are recommended reading for those wishing to gain a deeper understanding of the issues although it should be stated that the IPR WG do not necessarily endorse or agree with all the information contained therein:

- *Lost in Transposition: a study of the implementation of IPR in the WEEE Directive*, IIIEE, 2006.[28]

- *Where are WEEE now? Lessons from WEEE: Will EPR work for the US?* J. Huisman and F.Magalini, 2006.[29]

- *Extended Producer Responsibility: An examination of its impact on innovation and greening products*, C Van Rossem, N Tojo, T Lindhqvist, IEEE for Greenpeace International, FoEE and EEB, 2006.[30]

- *The Producer Responsibility Principle of the WEEE Directive*, Okopol, IIIEE and RPA for the European Commission, 2007.[31]

[28] Available at: http://www.greenpeace.org/international/Global/international/planet-2/report/2006/10/lost-in-transposition.pdf
[29] Available at: http://www.weee-forum.org/sites/default/files/documents/2006_where20are20weee20now_huisman.magalini1.pdf
[30] Available at: http://www.productpolicy.org/ppi/attachments/EPR-and-Eco-Design_2006.pdf

- *Individual Producer Responsibility in the WEEE Directive: From theory to practice?* Chris van Rossem, Doctoral dissertation IIIEE, 2008.[32]

- *IPR: A Review of Practical Approaches to Implementing Individual Producer Responsibility for the WEEE Directive*, INSEAD IPR Network, INSEAD Working Paper, 2010.[33]

- *Extended Producer Responsibility for E-Waste: Individual or Collective Producer Responsibility?* Atalay Atasu & Ravi Subramanian, 2012[34]

Papers proposing possible new models include:

- *Developing a Practical Solution to the Implementation of Individual Producer Responsibility for the WEEE Directive in the UK* published by ERP UK in December 2007;

- *Implementing individual producer responsibility for Waste Electrical and Electronic Equipment through improved cost allocation,* K. Mayers, R. Lifset. K. Bodenhoefer, and L. N. Wassenhove. Paper accepted for Journal of Industrial Ecology, 2012;

- *Fair and Efficient Implementation of Product Take-Back Legislation with Collective Producer Responsibility*, L. Gui, A. Atasu, O. Ergun, B. Toktay. Georgia Tech. Working Paper, 2012.

[31] Available at: http://ec.europa.eu/environment/waste/weee/pdf/final_rep_okopol.pdf
[32] Available at: http://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=1266797&fileOId=1266800
[33] Available at: http://www.insead.edu/facultyresearch/research/doc.cfm?did=45054
[34] Forthcoming in Production and Operations Management, 2012. Available at: http://www.prism.gatech.edu/~aatasu3/index_files/AS11.pdf

5 IPR within the context of existing WEEE systems

This section provides an introduction to the different types of WEEE systems which exist in countries or regions around the world. It provides a brief analysis of the extent to which these different systems incorporate IPR elements or provide incentives or rewards for DfRR.

5.1 Types of WEEE Systems

Following the evidence review, the IPR WG found it helpful to classify existing financing models for WEEE as follows:

- Market Share Approaches
- Return Share Approaches
- Payment for Own WEEE - 'Pure' IPR
- Hybrid Approaches

It is important to understand that:

- Every system has unique features and there are no official or definitive means of classifying or grouping WEEE models; and
- Some options described below are theoretical and have not been tested in practice.

5.2 Market Share Approach

Under a market share approach, the costs of WEEE arising in the waste stream are paid for by producers currently putting products on the market. The costs of WEEE arising are allocated between the producers currently active on the market using their market share percentage. Producers who previously had a large percentage of the market but have subsequently lost market share, have the benefit of not remaining responsible for legacy costs when their share shrinks. The current WEEE system for household WEEE in the UK (as well as Germany, Sweden, Austria and France detailed in Annex A) is an example of a market share approach.

How is financial responsibility allocated?

The amount of the relevant WEEE for which each producer is responsible is calculated as follows:

(A ÷ B) x C = D

Where:

- 'A' is the total amount of EEE put on the market by producer x within a particular product category over the specified compliance period;
- 'B' is the total amount of EEE put on the market by all producers within a particular product category over the specified compliance period;
- 'C' is the total amount in tonnes of WEEE arising within the relevant product category;
- 'D' is the total amount of WEEE that producer x must pay for within the relevant product category.

IPR elements and incentives for DfRR

In a typical market share system there are few DfRR incentives. Producers currently active on the market pay for mixed brand WEEE arising using a standard cost per tonne (or per unit) for all products within the same product category. The only potential incentive is to design more lightweight products as the market share ratio is usually calculated based on weight of products sold.

Modified market share systems can introduce additional DfRR incentives. A key example of this is the French bonus/malus system whereby mandated surcharges/reductions are applied to the producers' costs by their PCS based on the specified DfRR features of the products being POM. Further details of the French system are provided in Annex A.

5.3 Return Share Approach

Under a return share approach, producer responsibility is based on the share of each producer's products arising in the waste stream. Producers pay for a proportion of WEEE arising based on the number or weight of own brand products within that WEEE arising. This can be identified either via:

- brand sampling undertaken in accordance with agreed protocols;
- full brand counting (where brands are identified in all WEEE arising on a continuous basis).

Brand sorting (where brands are identified in all WEEE arising and separated to enable producers to take direct physical responsibility for treatment) can be added onto brand counting systems on an optional or mandatory basis. A return share system with full brand counting, mandatory brand sorting and a robust financial guarantee requirement to minimise the number of orphan WEEE becomes a 'Full IPR' approach as all producers would be fully paying for their own WEEE.

How is financial responsibility allocated?

Applying return share using brand sampling, the amount of the relevant WEEE for which each producer is responsible is calculated as follows:

(A ÷ B) x C = D

Where:

- 'A' is the total amount of WEEE bearing the brand name(s) of producer x within a particular product category. This is identified via sampling a representative amount of WEEE;
- 'B' is the total amount of WEEE arising within a particular product category during the sampling process;
- 'C' is the total amount in tonnes of WEEE arising within the relevant product category during the specified compliance period;
- 'D' is the total amount of WEEE that producer x must pay for within the relevant product category during the specified compliance period.

IPR elements and incentives for DfRR

All return share systems which are based on weight give a direct incentive to producers to reduce individual product weight and increase product longevity (i.e. product lifespan) since payment is dependent on these variables (and obviously the number of products placed on the market). Both these factors would reduce the costs paid by the producer by reducing the weight of own brand products appearing in the waste stream. A return share system may also have the perhaps unintended consequence of incentivising lower return rates in systems where this factor can be influenced by producers.

A major criticism of return share systems implemented to date is that they typically make no distinction between the costs of treating different branded products. Producers usually pay a flat fee per tonne of a specific product category and hence there are no further DfRR incentives. No distinction is made between the different properties of products within a particular product category when treatment costs are allocated. This is not necessarily insurmountable. It could be possible to incorporate different charges to producers based on product properties which result in lower treatment and recycling costs but it would add another layer of complexity to the sampling and calculations. The IPR WG has not identified any actual examples of return share systems which apply differentiated costs within a product category based on product properties.

A return share system with full brand counting and the option for producers to separate their own brand WEEE would give full access to potential DfRR paybacks to those producers who selected brand sorting and separate treatment[35]. These producers would benefit from the real costs of treating products with different product properties but may suffer from reduced economies of scale. An example of this approach is provided by Maine in the USA.

Maine's Electronic Waste (E Waste) Law

Scope

Maine was the first US State to introduce producer responsibility for end of life EEE.

The requirements were fully implemented in 2006 and were subject to further changes in 2011.The scope of the legislation has been broadened and now includes computer monitors, TVs, desktop printers, video game consoles (used with monitors/TVs) and computers and some other devices including screens over 4". Maine introduced a separate programme for mobile phones in 2008.

The manufacturer /brand owner of the equipment is responsible for the costs of handling and recycling the waste equipment. Manufacturers have to register with the State Government and declare both current and historic brands, weight and number of products sold. There is a requirement for all equipment to be clearly marked with a visible, permanent label clearly identifying the manufacturer.

The requirements were introduced in parallel to a ban on landfilling of CRTs and a ban on retailers from selling equipment from non-compliant manufacturers. The State publishes a list of brands that must not be retailed in Maine on their website. (www.maine.gov/dep/waste/ewaste/documents/donotsell.pdf)

Financing Collection and Recycling

Householders and small businesses are responsible for bringing their e-waste to a municipal collection site and can be charged a small fee. Equipment is transferred by the municipality to one of 10 consolidators which are approved by the State Government.

The costs for handling and recycling waste equipment are calculated either by return or

[35] Note, however, there is an issue regarding the timing of payback (immediate vs delayed) which is discussed in Section 2.4

market share according to the product. Originally the system operated only on a return share basis.

- Return Share: Manufacturers of monitors and desktop printers are invoiced for according to their actual products in the waste stream plus any orphan products. This is calculated through brand counting and weighing of each unit (not sorting) by the consolidators.
- Market Share: TVs and video game console manufacturers' costs are determined according to their market share and the total weight per waste shipment of televisions and game consoles.

In the case of return share products, manufacturers have the *option* of consolidators separating and storing their waste products, and then taking responsibility for the transporting and recycling of their waste from the consolidator. Under this option, manufacturers are invoiced by the consolidators for the initial transportation and handling, and the manufacturer arranges for and pays the additional transportation to their selected recycler and the recycling.

Those manufacturers who choose to separate and treat their own brand WEEE are effectively following a 'Full IPR' approach (see below). Currently, 13 manufacturers have chosen this route[36]. There are no requirements for individual producers to have financial guarantees[37].

Market share data for TVs, video games consoles as well as the orphan product share (for return share manufacturers) is calculated and published by the State. [38]

[36] See: http://www.maine.gov/dep/waste/ewaste/documents/option1mfrs112811.pdf

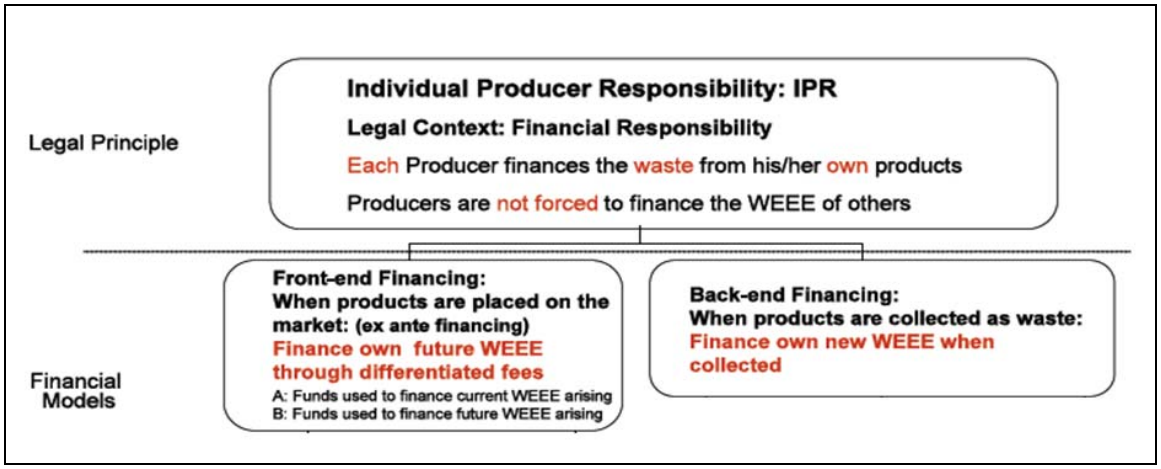
[37] INSEAD IPR Network, P. 35. According to the Maine Dept of Environmental Protection, Pers Comm, May 2012: When a trademark owner goes through a bankruptcy which results in termination of liability, this creates orphan waste which is then assumed by all other registered trademark owners in the E waste recycling program. The exception to termination of liabilities under bankruptcy is when the assets including intellectual properties come out of bankruptcy "whole" to a new company then liabilities are not terminated but transferred to the new company.

[38] http://www.maine.gov/dep/waste/ewaste/manufacturers.html

5.4 Payment for Own WEEE - 'Full IPR'

As the names suggests, this category covers a range of options whereby producers only pay for their own WEEE *and* the costs paid reflect the EOL costs for their own particular products. These may be front-end (where producers pay at the point of placing EEE on the market) or back-end (where producers pay at the point of WEEE arising):

Figure 5.1: Diagram to illustrate 'front-end' versus 'back-end' financing under IPR



Adapted from: Individual Producer Responsibility: Principle vs Practical Implementation, C van Rossem, 2009[39]

There are several options for implementing a 'Full IPR' approach, for example:

1) A return share system using full brand identification and sorting. WEEE is deposited at collective collection points and all products are identified by brand. Products are then separated by brand and producers are responsible for organising the treatment of their brand(s) either individually or in collaborative groups.

2) Producers are made individually responsible for organising take-back systems for their own brand(s) and funding the treatment of their own brand products collected. These requirements can be fulfilled either individually or in collaborative groups. There are no local authority collection points for all brands.

3) Producers WEEE costs are calculated based on 2 elements: (a) each item of EEE that is placed on the market and the allocated cost/revenue associated with collecting/treating/recycling that particular item of EEE; and (b) a charge associated with the historic WEEE arising funded on a collective basis according to the collection category. Thus producers pay for current products POM on an individual upfront basis and for historical WEEE on a collective basis. The PCS will hold these funds as a 'stakeholder' and access them when meeting the cost of collection, treatment, recovery and recycling of WEEE arising. Any shortfall between monies

[39] See p.8 http://www.canadianstewardship.com/2009presdownloads/7vanRossemCanadianStewardship.pdf

collected versus the WEEE arising costs would need to be covered by an additional levy. The collective collection system (e.g. Local Authority DCFs) could remain[40].

Back-end financing, as illustrated in examples 1 and 2 above, are well established within the research literature as a form of 'Pure IPR'; the Japanese systems for PCs and Household Appliances are the most frequently cited examples. Front-end financing forms of 'Full IPR' are a more recent concept and no examples of these systems have been implemented in practice to our knowledge. There are some variations specific to the lighting sector.

Japanese Law for Recycling of Specified Kinds of Home Appliances (HARL)

In Japan, the policy goal is social equality and ecological efficiency. The purpose is to shift the responsibility for the recycling and disposal of home appliances from local governments to producers. HARL in Japan required about 200 collection points for each producer group to be set up initially around the nation to provide equality of access to consumers. Financial responsibility is not the direct responsibility of producers. Instead, consumers pay a fee at the point of disposal and this fee is the same throughout Japan.

Scope

The Japanese WEEE system covers a limited number of household products namely air conditioning units, refrigerators, TVs, washing machines and clothes dryers. There is a separate similar system for personal computers (PCs) although this is a voluntary safety net program. In reality, most used PC's are bought and sold on the secondary market.

The system has been operation since 2001 and its scope was originally established to capture those waste products which:

- were considered to be economically feasible to recycle;
- were traditionally sold through retailers;
- were considered well-suited to design for recycling initiatives; and
- at the time (late 1990's) had limited or no recycling channels..

Collection and Recycling

Consumers pay a fee at the point of disposal for all products. The fee ranges from around £14 to £38/product. The fee is set by the product manufacturers and the collection is predominately undertaken by retailers. The waste equipment is transferred to one of 379 consolidation centres where equipment is separated by individual brands or groups of brands. The equipment is transferred to one of 49 recycling plants with the aim that producers take back their own product for recycling. In practice, producers have organised themselves into two Groups.

- Group A consisting of Toshiba Corporation, Panasonic Corporation, and other

[40] This model is based on that outlined in K. Mayers, R. Lifset. K. Bodenhoefer, and L. N. Wassenhove. Implementing individual producer responsibility for Waste Electrical and Electronic Equipment through improved cost allocation. Paper accepted for Journal of Industrial Ecology, 2012.

companies; and

- Group B consisting of Sharp Corporation, Sanyo Electric Co., Ltd., Sony Corporation, Hitachi Appliances, Inc., Fujitsu General Ltd., Mitsubishi Electric Corporation, and other companies.

Each manufacturer originally aimed to operate at least one treatment plant themselves with the objective of (a) collecting information to inform the design functions and (b) identifying the costs of recycling. The manufacturers now share facilities including third party recyclers[41]. There are no collection targets, but manufacturers have to meet specific recycling targets for each type of product. A major factor which influenced the decision to introduce a consumer disposal fee was the handling of orphan and historic products. These unidentifiable products are separated out and handled by 'designated corporations'.

Future Developments.

Japan's Environment Ministry is currently developing a plan to recycle more rare earth metals from small sized electric and electronic products. Japan is keen to reduce it's reliance on imports of rare earth metals required for its manufacturing sector. The proposals include establishing a licensing system for companies to collect materials for recycling as opposed to introducing mandatory end-of-life product requirements. The aim is to finance the programme through the value of recovered metals from specific compact digital 'gadgets' namely: mobile phones, game players, portable CD/MD players, portable digital audio players, digital cameras, automobile navigation systems, video cameras and DVD players.

[41] http://panasonic.net/eco/petec/qanda/#Q01

5.5 Hybrid WEEE Systems

The 3 categories outlined above do not have to be mutually exclusive; hybrid models are possible which combine approaches. For example, the default system may be based on market share but producers may be able to opt for return share on either an individual producer or product category basis[42]. Alternatively, the default system may be based on return share but apply an adjustment/weighting mechanism to reflect the processing cost differentials between products or other factors[43]. In another combination, a return share system may give producers the choice to opt for collective collection and treatment based on a flat fee for all products within the category or to separate out their own brand products and organise treatment themselves. An actual example of a hybrid approach is the E Cycle system in Washington:

Electronic Product Recycling Program - Chapter 173-900 WAC (*E Cycle Washington*)

Scope

The *Washington E Cycle* programme scope is (like in many US states) restricted to TVs and some IT equipment namely monitors, screens and computers. Washington and its neighbouring State of Oregon operate very similar programmes.

In Washington, manufacturers must register with the State, pay an administrative fee and participate in an approved recycling plan in order to be able to sell products in Washington. Retailers must not sell equipment from unregistered manufacturers.

Manufacturers automatically become participants of the Standard Plan unless they develop an Independent Plan. Manufacturers can establish an independent plan either alone or with others if their combined return share is over 5%. The legislation places restrictions on the ability of white box manufacturers to employ an Independent Plan.

- The 'standard plan' is named the Washington Materials Management and Financing Authority (WMMFA) and has a board of directors including five electronic manufacturer representatives who oversee the programme- appointed by the State.
- In 2009, there were no independent plans – all manufacturers joined the standard plan. Two applications were submitted for operation in 2010, but these were rejected.

Financing Collection and Recycling

Similarly to Oregon, there is a requirement to have staffed collection services in all towns with a population over 10,000. Manufacturers are required to contribute, through their plan, to the costs incurred by municipalities for these waste collection activities.

In addition, the WMMFA is responsible for covering all administrative and operational costs associated with the transportation and recycling of their participating manufacturers' equivalent share of covered electronic products sold in Washington (at

[42] Developing a Practical Solution to the Implementation of Individual Producer Responsibility for the WEEE Directive in the UK, ERP UK, December 2007

[43] Fair and Efficient Implementation of Product Take-Back Legislation with Collective Producer Responsibility, L. Gui, A. Atasu, O. Ergun, B. Toktay. Georgia Tech. Working Paper, 2012.

present 100% as no independent plans are operational).

The WMMFA decides how subsequently to charge its members and has selected a mechanism based on a combination of market share and return share (50:50 market to return in 2009). However this is scheduled to revert to 100% market share mechanism over time, this process should be complete by 2016. Within the WMMFA, members can choose to collect and recycle their own waste themselves (known as a flex participant). These participants benefit from reduced standard plan operating costs.

Market share data is based on the weight of electronic products sold in Washington State. Return share is based on a manufacturer's percentage, by weight, of identified brands of covered electronic products returned for recycling. The State is required to determine the return share for each manufacturer.

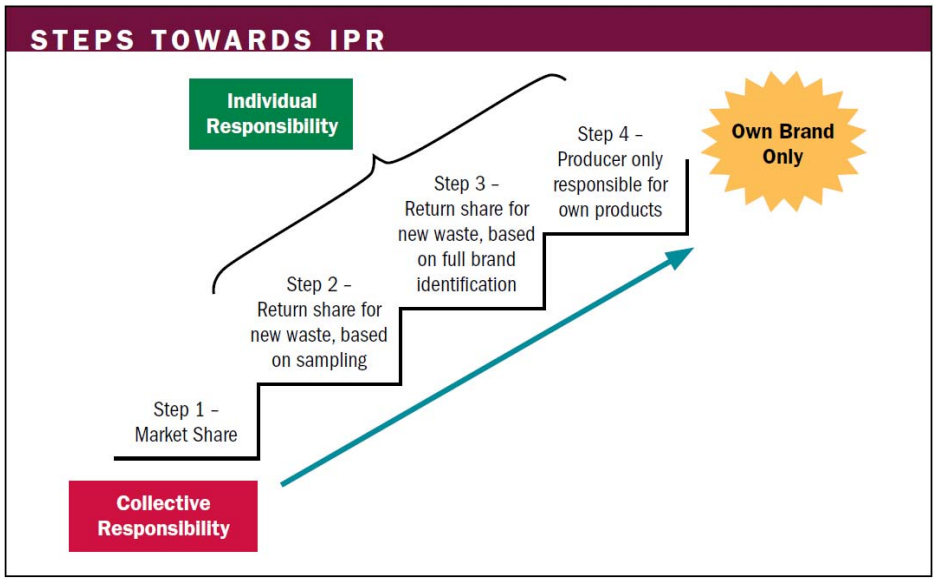
Practicalities of Return Share Calculations.

In Washington, return share is determined through sampling events at recyclers throughout the year. These samples provide data on the type, weight and brand owner of the products returned for recycling. In 2011, 34 sampling events were conducted. At those events, over 11,900 TVs, monitors and computers were randomly sampled and the data on each unit was recorded for use in determining return share by manufacturer. In 2011, orphan products were calculated at 8.62%.

5.6 Moving towards IPR

As discussed previously, at its essence IPR means that producers are made individually responsible for their own products at end of life. This responsibility can be purely financial or financial and physical. Take-back systems may be individual or collectively organised.

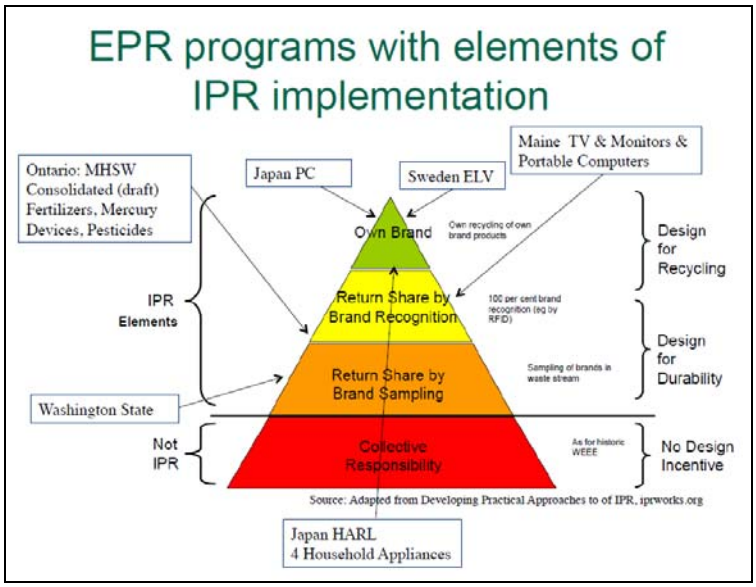
Figure 5.2: Steps to IPR According to IPR Works



Source: Developing Practical Solutions to Individual Producer Responsibility. *www.iprworks.org*

Traditionally within the literature, the move towards a 'Pure IPR' WEEE system has been seen as a linear progression starting with market share allocation, moving through return share systems and resulting in the ultimate goal whereby producers organise their own recycling of own brand products.

Figure 5.3: Examples of EPR Programmes and their IPR Elements



Source: IPR: Principle vs Practical Implementation, C van Rossem, 2009[44]

More recently this has been questioned, as some experts have rejected the linear framework. They argue that a return share system which allocates producers WEEE costs based on the proportion of their own brand WEEE arising but charges a flat fee per tonne of a specific product category (i) does little to achieve the DfRR goals of IPR and (ii) should not be viewed as a stepping stone or part of a linear relationship to a single 'pure IPR' goal based on own recycling of own brand products.

This has resulted in the development of alternative approaches which move away from a 'purist' form of IPR and focus on the aim of financially rewarding producers for products which carry environmental benefits at end of life and/or lower treatment costs without necessarily requiring any intervention at the point of collection. These approaches follow the principle that the WEEE costs paid by producers should reflect the attributes of the products they are POM (i) based on specified product properties e.g. technology or material composition rather than brand and (ii) via front end payment i.e. the financial benefit or penalty should be incurred when placing the product on the market to give immediate rather than delayed payback. A simplified and limited example of this principle is the French bonus/malus applied to a market share system. A fuller example is the model developed by Kieren Mayers et al[45].

[44] See p.7 http://www.canadianstewardship.com/2009presdownloads/7vanRossemCanadianStewardship.pdf
[45] Some further details of this model are given in Section 4. Source: K. Mayers, R. Lifset. K. Bodenhoefer, and L. N. Wassenhove. Implementing individual producer responsibility for Waste Electrical and Electronic Equipment through improved cost allocation. Paper accepted for Journal of Industrial Ecology, 2012.

5.7 Conclusions

The IPR WG found it helpful to classify existing financing models for WEEE as follows:

- Market Share Approaches
- Return Share Approaches
- Payment for Own WEEE – 'Full IPR'
- Hybrid Approaches

These approaches are explained in order to refer to the different 'types' of WEEE system. Relevant case studies are given from France, the USA and Japan as examples of each approach. However, it should be highlighted that:

- Whilst the categories are useful, there is no single, universally recognised framework for categorising WEEE systems based on IPR;
- Within each approach several variants are possible and these can significantly affect the level of incentive or reward for DfRR provided by a specific approach;
- The 3 categories do not have to be mutually exclusive, hybrid models are possible which combine approaches e.g. an opt in / opt out basis. For example, the default system may be based on market share but producers may be able to opt for return share on either an individual producer or product category basis;
- The 3 categories are based on existing examples of WEEE systems which incorporate IPR elements. They do not necessarily cover all possible solutions and should not restrict the development of other approaches;
- There are not, to date, any blueprints for the 'ideal' IPR system which meets Article 8.2, provides significant incentives/rewards for DfRR, is easy and practical to implement, and can be transferred to other markets transcending cultural differences in consumer behaviour.

6 Challenges Facing IPR Approaches in Europe

Implementing any IPR approach for WEEE faces a series of challenges. Some challenges are common to all IPR systems, whereas implementing IPR in EU Member States needs to consider and meet the requirements of the WEEE Directive.

6.1 Key Challenges

The Product Policy Institute sums it up well in their observation that "EPR is simple in concept, but complex in execution"[46], the same statement can be applied to IPR in the context of the European WEEE Directive.

This section outlines the key challenges facing any IPR approach for WEEE in the EU. These have been identified as:

- Product Scope
- Product and Collection Categories
- Collection Targets
- Historic versus New WEEE
- Definition of Producer
- Producer marking & Brand Identification
- Financial Guarantees
- Accruals

A summary is provided at the end of this section.

[46] http://www.productpolicy.org/content/epr-issues

6.2 Product Scope

The scope of the WEEE Directive is extremely broad compared to any other WEEE legislation globally. Experience in the USA shows that different models (market share or return share) can be applied to different product categories within the same scheme. In Japan, different systems are used for PCs compared to home appliances and a new system is being planned for small ICT products. The following box explains the scope of the WEEE Directive and the resulting challenges it poses for IPR.

WEEE Directive Requirement	Implications for IPR
Scope The current WEEE Directive applies to 10 product categories: 1. Large household appliances; 2. Small household appliances; 3. IT & Telecomms equipment; 4. Consumer equipment; 5. Lighting equipment; 6. Electrical & Electronic Tools; 7. Toys, Leisure & Sports equipment; 8. Medical Devices; 9. Monitoring & Control Instruments; 10. Automatic Dispensers. Under the WEEE recast, after 6 years the scope will cover 6 product categories on an 'open' scope basis: • Temperature Exchange Equipment; • Screens & Monitors; • Lamps; • Other Large; • Small ICT; • Other Small.	The scope of the WEEE Directive is broader than any other WEEE legislation globally. The products and their market conditions vary considerably. As it is possible to meet Article 8.2 requirements via a variety of systems, is it appropriate to apply a single financial allocation model to all WEEE or could variants be used per product category? What scope is there for flexibility to allow different compliance routes? Should a new system be phased in targeting the most appropriate product categories first?

This leads to the question, is a single system appropriate for all products covered by the WEEE Directive? Given:

(a) the different characteristics of electronic products in terms of composition, weight, product lifetime and possible trade-offs between improving environmental impacts at end of life and overall product environmental impact.

(b) the different market factors e.g. number of producers within a product category, the nature of those producers – long term brand owners with short supply chains versus importers with rapidly changing brands and long supply chains, stable product categories versus those experiencing rapid convergence or expansion.

For example:

- A return share system will be most suitable for product categories with a limited number of major dominant brands. It will be more difficult to implement for products dominated by multiple, changing brands and small physical product size e.g. toys.

- A system where producers are required to, or have the option to, establish their own take-back service is easier for smaller, lightweight products which can be returned via a postal or courier system.

- Introducing a return share system for a product category once dominated by a single brand but now shared more equally by multiple brands could place a heavy and unexpected burden on the once dominant producer.

- In a system based on differential charges by product properties (e.g. technology and material composition) rather than brand, there may be some product categories with clear points of differentiation and others where products are relatively homogenous.

Clearly Article 8.2 should be fulfilled for all forms of new WEEE from private households if the UK's WEEE system is to be in full compliance with the Directive. However, as illustrated in the previous chapter, there are several options which meet the Article 8.2 requirement such as a return share system with full brand counting and optional or mandatory separation; a return share system with differential treatment charges; or a front end financing option based on forecasted costs of treatment.

Is it appropriate to apply a single financial allocation model to all WEEE or could variants be used per product category? Would multiple systems create too much complexity in terms of administration and enforcement? What scope is there for flexibility to allow different compliance routes? Should a new system be phased in, targeting the most appropriate product categories first? These are all questions to consider.

The Experts' View

Atalay Atasu interview:

- If recycling/processing costs are not differentiable between brand names within a category, there is no need for IPR;
- In Maine different categories use different systems based on manufacturers' choice. Allowing producers to choose lets them play to their benefits.

Chris van Rossem interview:

Some product groups are more suitable for return share than others:

- Products requiring manual disassembly are good candidates e.g. CRT and cooling - they are separately managed so easier to identify;
- ICT is highly suitable for IPR as many manufacturers support it (i) partly driven by the potential value (ii) it is also a very competitive sector.

The Experts' View

Huisman & Magalini interview:

- Producers may want IPR for some categories and not others based on potential benefits. This would be very complicated. Multiple systems lead to overlap between them and examples of good and bad practice - you need to reward good practice and avoid free riding;
- Multiple systems would not work in a small Member State, economies of scale are getting ok around 20M inhabitants served [so] should be ok in the UK.

6.3 Product and Collection Categories

Product categories are important because in a market share or simple return share system they are the primary cost differentiator. Typically producers are charged a flat fee per tonne within a product category. This can lead to significant discrepancies depending on how the product categories are set.

The following box describes the product and collection categories used in the current UK system and the resulting implications for IPR.

WEEE Directive Requirement	Implications for IPR
Product & Collection Categories UK Producers are currently required to report the weight of EEE placed on the UK market using the 10 EEE categories set out in the WEEE Directive plus display equipment, cooling appliances and gas discharge lamps. This gives a total of 13 reporting categories. In contrast, WEEE in the UK is usually collected at DCFs in 5 collection categories: Cold (e.g. refrigerators, air conditioning units), Display (e.g. TVs, monitors), LDA (Large Domestic Appliances e.g. washing machines), Mixed WEEE, and Lighting . Note that under the WEEE recast, the current 10 product categories will be revised after 6 years to 6 product categories: Temperature Exchange Equipment; Screens & Monitors; Lamps; Other Large; Small ICT; Other Small.	Product categories are an important tool for data reporting and differentiating compliance fees. The more homogeneous the product category in terms of materials and treatment costs, the closer the match is likely to be between actual end of life costs for a particular product and fees charged by compliance schemes for that product category.

The implications of category definition can be explained using the example of mobile phones. Waste mobile phones typically have a very high value and are within WEEE Category 3: IT and Telecommunications Equipment which includes printers, laptops, copiers and desk based phones. If mobile phone producers are charged a flat fee per

tonne covering Category 3, their WEEE costs are significantly higher than if these producers are charged based on a separate product category for mobile phones[47].

Another example is cold appliances many of which are more expensive to treat than other LDA due to the presence of oil and refrigerants. In the UK, cold appliances collected and reported separately from the Large Household Appliances category specified in the WEEE Directive.. This means that the non-cold LDAs do not pay an artificially inflated cost due to the presence of cold appliances. The more homogeneous the product category in terms of materials and treatment costs, the closer the match is between actual end of life costs for a particular product and fees charged by compliance schemes for that product category.

Creating narrower product categories within a market share system is one way of trying to close the gap between the costs paid by producers and the actual costs of collecting and treating a particular product. However, under a market share system creating narrower product categories can cause problems if applied to products going through rapid product convergence as there are then insufficient current producers placing products on the market within that category to fund the WEEE arising.[48]

This problem is avoided within a return share system and narrower product categories can be applied to return share even down to a category sub-set. This assumes that the subset can be easily identified and counted or separated e.g. displays can be divided into CRTs versus Flat panel. For product categories where this applies, sub-sets can be mandated within a return share system and this would arguably go some way to meeting Article 8.2 of the WEEE Directive without obliging producers to treat their own brand WEEE separately.

The Experts' View

Atalay Atasu interview:

- Volume based systems (such as market share or return share) without cost differentiation between product categories will not work.

Atasu, Van Wassenhove & Sarvary in Efficient Take-Back Legislation 2009:

- Referring to the current WEEE Directive, "Because the classification of product categories and selection of targets are not related to any environmental impact measure but weight, most producers state that they do not have an incentive to increase the environmental friendliness of their products, and therefore do not invest in environmental designs."

Kieren Mayers interview and pers. comm:

- "A flaw of the original WEEE directive was that the product categories were too broad; they did not reflect how WEEE is collected or recycled in practice. With a

[47] Redesigning the Camel: the European WEEE Directive, K. Mayers et al, Journal of Industrial Ecology, 2011. P. 5.

[48] Furthermore applying narrower product categories within a market share system without financial guarantees increases the risk of a major player withdrawing from the market and the remaining producers being unable to bear the costs.

The Experts' View

change to only 5 collection-related categories, the current WEEE revision will do little to address this shortcoming. Compliance schemes presently charge producers average collection and treatment costs for a mixture of unsimilar products and brands. As a direct consequence, producer responsibility for WEEE within the EU cannot create financial incentives for producers to design their products so that they are easier to treat and recycle at end-of-life. With better categorisation and allocation costs, compliance schemes could address this problem and charge producers more representative fees."

6.4 Collection Targets

WEEE Directive Requirement	Implications for IPR
Collection Targets The existing collection target is set at 4kg on average per inhabitant per year of separately collected WEEE from private households. Under the recast WEEE Directive, targets for separately collected WEEE will apply to both household and non-household WEEE and will increase as follows: • Before 2016, each Member State shall ensure that it achieves the target of 4kg per capita or the same amount of WEEE in weight as an average of the weight that was collected over the three preceding years, whichever is greater; • After four years, the target will be 45% POM calculated on the basis of the total weight of WEEE separately collected in a given year in the MS, expressed as a percentage of the average weight of EEE placed on the market in the three preceding years in the MS; • After seven years, this target will change to either 65% of EEE POM in the 3 preceding years or alternatively 85% of WEEE generated in the MS; • MS may set more ambitious separate collection rates; • Within 3 years, the Commission will examine the possibility for setting individual collection rates for specified product categories, particularly temperature exchange equipment, photovoltaic panels, small equipment, including small IT and telecommunication equipment and for lamps containing mercury.	Any changes to the current system will need to ensure that high levels of collection are achieved in line with the targets. A new approach could be considered which sets producers' WEEE obligations based initially on a 45% POM basis.

The primary implication for any future UK WEEE system is that it will have to meet the collection targets. These could be applied separately to household and non-household

WEEE as long as the combined target is met. Similarly the target can be applied to all product categories equally or targets could be varied per category as long as the combined target is met.

This raises the question would some types of IPR system have a negative impact on collection rates? Expert opinion is divided and analysis would have to occur on a case by case basis. Any changes to the current UK collection system for household WEEE, which is primarily based on local authority managed DCFs accepting multiple brands for all relevant product categories, raises concerns amongst some stakeholders that collection rates will decrease. However, the overall conclusions are that:

- Some IPR approaches would require no changes to the current collection system. Many stakeholders confuse IPR with requiring individual take-back systems which is not always the case;
- An IPR system which removes multi-brand collection points such as the current DCFs and provides only one route for returning each brand would be likely to reduce collection rates for most products unless end-user incentives were provided;
- Arguably collection rates will be maximised either by having multiple, easily accessible collection channels i.e. a combination of return options for any one product or by having fewer routes but with user-incentives to return products.

The Experts' View

IPR INSEAD Network[49]:

- Case study data from the Japanese Home Appliance Recycling Law (HARL) for 2001 – 2006 states that "the collection system is close to meeting the WEEE target of the EU of 4kg/capita/year … It should be noted that Japanese home appliances are generally lighter than those of their European counterparts … [and] that the total units handled through the producer schemes is estimated to be just over 50% of the total waste units arising."
- Case study information on the Bosch led take-back system for power tools in Germany, a return share system based on brand counting states that "Since WEEE collected at municipal collection sites in Category 5, is a mixed batch of product types with varying recycling cost structures, the cost to manage this WEEE is higher than purer streams of primarily tools collected from retailers, businesses and service centres. This provides a business case for producers to become engaged in individual collection efforts in order to collect less mixed WEEE from municipalities. This may lead to increased total tonnages of WEEE collected in a country".

[49] IPR: A Review of Practical Approaches to Implementing Individual Producer Responsibility for the WEEE Directive, INSEAD IPR Network, INSEAD Working Paper, 2010, p. 26 and p. 45. http://www.insead.edu/facultyresearch/research/doc.cfm?did=45054

The Experts' View

Kieren Mayers[50]:

- "UNU study claims that collection rates [under an IPR system] would be reduced as: Increased collection % has increased costs, whereas each individual producer would therefore be incentivised to reduce collection rate. This is not demonstrated by examples we may consider IPR to date, such as Japanese and Bosch systems, where equivalent collection rates are achieved … IPR is often a feature that producers actively finance and market in addition to their collective scheme obligations"

Atasu, Van Wassenhove & Sarvary[51]:

- Based on manufacturer quotes, they assume in their model that if manufacturers collect directly from individuals, this would lead to scale diseconomies in collection costs (i.e. higher unit collection cost as collection volume increases) whereas collection from public collection centres would imply a constant per unit collection cost.

A secondary implication of the new collection targets in the WEEE recast is the possibility to delegate these down to producer level. Calculating producers' obligated tonnages based on specified collection targets (percentage POM over previous 3 years) could be used as an alternative to the current market share system. This new approach would set producers' WEEE tonnage obligations based on a percentage POM designed to meet the overall collection target set in the WEEE recast. Different targets could be set for different product categories and increase over time, as long as the overall collection target set in the recast is met (initially 45% POM). The percentage POM collection targets would need to be applied separately to each EEE category, otherwise producers of costly to recycle product categories might meet their tonnage through financing only the lowest cost WEEE categories.

This approach would need to consider a range of issues e.g. how to finance any remaining WEEE collected at DCFs once each producer had met their finite obligated tonnage, how to calculate obligated tonnages for new entrants to the market, whether to require individual financial guarantees in order to cover producers who withdraw from the market and how to apply the target to B2C versus B2B tonnages[52]. From an IPR perspective, it is not an IPR approach in itself. However, an obligated tonnage calculation based on percentage POM could be considered a step towards IPR compared to market share, and could potentially provide a baseline on top of which additional IPR mechanisms could be added.

[50] Kieren Mayers, Geodis UK, Strategic Concerns - Challenges to implementation and criteria for IPR systems presentation, 24.01.2008
[51] Atasu, Van Wassenhove & Sarvary: Efficient Take-Back Legislation 2009, p. 254
[52] There is no distinction between household and non-household WEEE within the collection target set in the WEEE recast. However, if a percentage POM calculation was used to set obligated tonnages at producer level some distinction would probably be required to ensure that B2C WEEE was adequately financed.

6.5 Historic versus New WEEE

As explained in Chapter 1.2, Article 8 of the WEEE Directive sets different financing requirements for 'new' and 'historic' WEEE from private households.

WEEE Directive Requirement	Implications for IPR
Distinction between 'New' and 'Historic' WEEE Products put on the market before 13/08/2005 are termed 'historic' WEEE. For the purposes of this report, products put on the market after 13/08/2005 are termed 'new' WEEE. Article 8 of the WEEE Directive specifies an IPR financing model for 'new' WEEE and a CPR financing model for 'historic' WEEE. In order to enable physical identification of 'new' WEEE, Article 11(2) of the original WEEE Directive and Article 15(2) of the WEEE recast require Member States to ensure that producers apply a mark to all relevant EEE indicating that it was placed on the market after 13 August 2005. Preferably the European Standard EN 50419 shall be applied for this purpose.[53]	The challenge is to incorporate two financing mechanisms, one based on CPR for historic WEEE and one on IPR for new WEEE. For some product categories with shorter lifespans, the amount of historic WEEE arising may be negligible and a single financing mechanism based on IPR may now suffice. For products such as LDA this is not yet likely to be the case.

The INSEAD IPR Network[54] proposes 2 possible solutions to this issue:

1. Apply CPR financing to historic WEEE and IPR financing to new WEEE using the product marking to physically differentiate between the two. It is pointed out that this could be 'challenging';

2. Use sampling to identify the point in time at which a particular product category is predominantly comprised of new WEEE i.e. the proportion of historical WEEE in waste arising is negligible. At this point introduce IPR financing for the whole of that product category.

Clearly the point at which (2) will apply will vary depending on the average lifetime of products within a particular category. Small household appliances (SHA) tend to have a much shorter lifespan than large domestic appliances (LDA) for example. According to the INSEAD IRP Network[55], sampling studies demonstrated that ICT products in the waste stream were on average between 7 – 9 years old which implies that between 2012 – 2014 an IPR financing model could be applied to the whole product category. The IPR WG is

[53] European standard EN 50419 was adopted by CENELEC in March 2006.
[54] IPR: A Review of Practical Approaches to Implementing Individual Producer Responsibility for the WEEE Directive, INSEAD IPR Network, INSEAD Working Paper, 2010.
http://www.insead.edu/facultyresearch/research/doc.cfm?did=45054
[55] Ibid.

unaware of any more recent sampling exercises to identify the ratio between historic and new WEEE across different product categories[56].

6.6 Definition of Producer

WEEE Directive Requirement	Implications for IPR
Definition of Producer At present, the definition of 'Producer' covers those who: • manufacture and sell EEE on 'own brand' basis; • resell EEE manufactured by others under its 'own brand'; • imports or exports EEE into a MS on a professional basis. Under the recast, Member States must allow 'authorised/ legal representatives' for producers that are already established in another Member State. In the UK, there are over 5000 registered producers.	Identification of the producer in order to allocate end of life costs for own brand products is a key element of some IPR systems. Due to the definition of 'producer', WEEE arising bearing a single brand name may have been POM by a number of different producers. How to allocate responsibility between multiple producers for a single brand is therefore a key challenge for IPR systems based on brand e.g. return share.

Under both the original and recast WEEE Directive, the producer who must bear the costs of treating B2C WEEE at end of life may be the original manufacturer, brand owner or importer. This potentially creates a problem with allocating 'grey imports' or parallel imports under a return share model because multiple 'producers' will have put the same brand products onto the market. For example, if 100 units of brand *x* are placed on the UK market, this may consist of 50 tonnes POM by producer A, 20 tonnes by producer B and 30 tonnes by producer C. The difficulty is how to allocate financial responsibility for brand *x* products on a return share basis when they arise in the waste stream.

A possible solution to the allocation problem could be to require producers to report their tonnages POM by brand within a product category, apply an estimated lifespan and then use the ratios to allocate the financial costs of treating brand x within WEEE arising in a particular year. An alternative is to allocate responsibility to a 'primary' producer as illustrated by the system used in Maine, USA although this may not be possible within the constraints of the European WEEE Directive.

[56] This paper does provide some estimates for particular product categories, see Practicalities of individual producer responsibility under the WEEE directive: experiences in Germany, Rotter,Vera Susanne; Chancerel,Perrine; Schill,Wolf-Peter, Waste Management & Research , Volume 29 (9): 931 SAGE – Sep 1, 2011

Maine E Waste Law: Definition of Producer

- E Waste law assigns primary responsibility to the entity that has the brand name registered as a trademark with the United States Patent and Trademark Office;
- If the trademarked brand is not registered in the US nor has no US office then responsibility is allocated to the first importer of the product;
- In the US the trademark owner has significant control over the use of their brand name on products and trademark infringement cases are fairly easily enforced by the trademark owner.

The INSEAD IPR Network suggest that either (a) Producers take responsibility for grey imports related to their brand or (b) importers continue to take a market share responsibility for grey imports, with producers able to take a return share responsibility[57].

6.7 Producer Marking & Brand identification

WEEE Directive Requirement	Implications for IPR
Producer Marking & Brand identification The WEEE Directive (2002/96/EC) currently includes a specific requirement under Article 11(2) that: "*Member States shall ensure that any producer of an electrical or electronic appliance put on the market after 13 August 2005 is clearly identifiable by a mark on the appliance*". Under the WEEE recast the producer identification requirement has been removed. Whilst the RoHS recast contains some manufacturer and importer identification requirements, these do not have to be indelibly marked on the products in all cases.	Back-end IPR systems typically rely on identifying the brand on WEEE arising. This means that either (a) the brand or producer's name must be clearly and indelibly marked on the product so that it can be clearly identified at end of life or (b) some form of bar code or RFID identification system needs to be in place. The current recast WEEE Directive does not adequately mandate this nor does the RoHS Directive.

The producer marking requirement set out in Article 11(2) of the original WEEE Directive (see above) was transposed into Article 16 of the current UK WEEE Regulations:

[57] IPR: A Review of Practical Approaches to Implementing Individual Producer Responsibility for the WEEE Directive, INSEAD IPR Network, INSEAD Working Paper, 2010, P. 69.
http://www.insead.edu/facultyresearch/research/doc.cfm?did=45054

UK WEEE Regulations, Article 16

(1) A producer shall mark EEE that he puts on the market in such a manner that:

(a) he can be easily identified by that mark as the producer of the equipment ("the producer identification mark"); and

(b) the equipment can be easily identified as having been put on the market after 13th August 2005 ("the date mark").

(2) The producer identification mark and the date mark shall be affixed in a visible, legible and indelible form to each item of equipment.

The implementation of Article 16 causes two challenges for return share system based on brand identification:

- The brand *x* product does not have to physically bear the name of producer A, producer B or producer C. To meet the requirements of Article 16 of the UK WEEE Regulations, importers into the UK must ensure that the EEE they were placing on the market carries one of the marks that they registered through their producer compliance scheme;

- if the equipment was subsequently rebadged during refurbishment, the WEEE requirements would still fall on the original 'producer' who had placed the product on the market for the first time[58]. However, if the rebadge removed the original producer identification there would then be no way at present of allocating this product at end of life under a return share system.

A more fundamental problem is that the producer identification requirement within the original WEEE Directive is not included within the text of the recast WEEE Directive. Reference to the producer identification mark have been removed and only refer to the mandatory application of the crossed out wheelie bin symbol. Use of European standard EN 50419 which still maintains reference to producer identification is preferred but not mandated. It is thought that the producer identification requirements were removed from the WEEE recast because they were considered to be adequately covered within the RoHS recast. This potentially creates difficulties because although the RoHS recast includes some requirements for producer identification (see below), these do not have to be indelibly marked on the product in all cases.

[58] WEEE Regulations 2006: Government Guidance Notes, November 2009, BIS. Pages 41-42. http://www.bis.gov.uk/files/file54145.pdf

Producer identification requirements within the RoHS Directive 2011/65/EU (recast)

Article 7(g) manufacturers ensure that their EEE bears a type, batch or serial number or other element allowing its identification, or, where the size or nature of the EEE does not allow it, that the required information is provided on the packaging or in a document accompanying the EEE;

Article 7(h) manufacturers indicate their name, registered trade name or registered trade mark … on the EEE or, where that is not possible, on its packaging or in a document accompanying the EEE ...;

Article 9(d) importers indicate their name, registered trade name or registered trade mark … on the EEE or, where that is not possible, on its packaging or in a document accompanying the EEE …;

Article 10(a) when making an EEE available on the market, distributors act with due care in relation to the requirements applicable in particular by verifying that … the manufacturer and the importer have complied with the requirements set out in points (g) and (h) of Article 7 and in point (d) of Article 9.

The issue of physical marking in order to identify the producer could be resolved, if and when EEE products widely adopt technologies such as RFID identification systems or similar.

6.8 Financial Guarantees

A guarantee can be defined in law as "an undertaking to answer for the payment or performance of another person's debt or obligation in the event of a default by the person primarily responsible for it"[59]. Within the context of WEEE, a financial guarantee (FG) is intended to ensure that if a producer leaves the market, their WEEE costs are not automatically borne by the other producers or by the state[60]. Any WEEE system which specifies that producers are only legally responsible for their own WEEE will need some form of FG requirement[61]. This guarantee would cover the costs of collecting and treating WEEE in the situation where a producer withdraws from the market, leaving orphan WEEE for which the other producers are not legally responsible.

[59] http://oxforddictionaries.com/definition/guarantee

[60] The recast WEEE Directive explains in the preamble that "Each producer should, when placing a product on the market, provide a financial guarantee to prevent costs for the management of WEEE from orphan products from falling on society or the remaining producers".

[61] Unless the cost of 'orphan products' is to be met by Government.. For example, the Government could impose some form of levy on EEE products placed on the market. This levy and the fund it gives rise to could also help mitigate the financial costs arising from a producer default and/or insolvency event.

WEEE Directive 2002/96/EC Article 8.2:
Financing WEEE from Private Households – Financial Guarantee

1. Member States shall ensure that, by 13 August 2005, producers provide at least for the financing of the collection, treatment, recovery and environmentally sound disposal of WEEE from private households deposited at collection facilities ...
2. For products put on the market later than 13 August 2005, each producer shall be responsible for financing the operations referred to in paragraph 1 relating to the waste from his own products ...

   Member States shall ensure that each producer provides a guarantee when placing a product on the market showing that the management of all WEEE will be financed …. This guarantee shall ensure that the operations referred to in paragraph 1 relating to this product will be financed. The guarantee may take the form of participation by the producer in appropriate schemes for the financing of the management of WEEE, a recycling insurance or a blocked bank account.

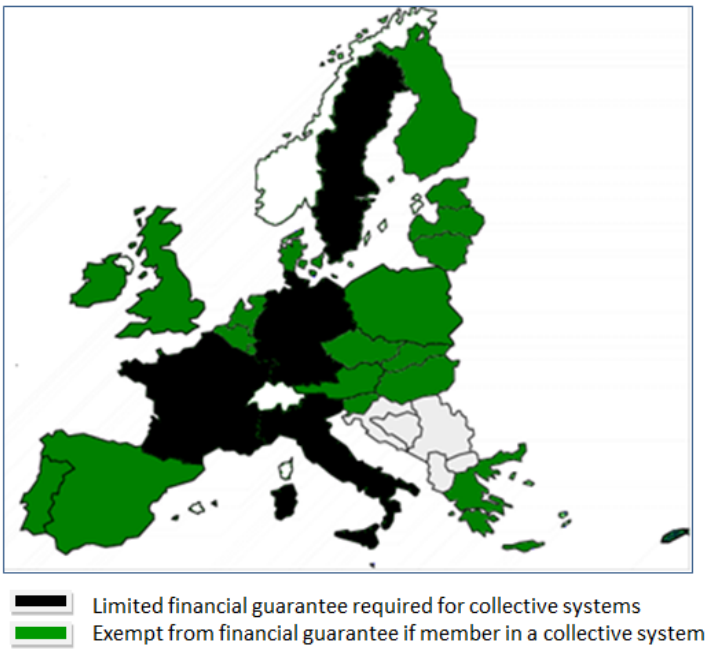
Article 8.2 of the WEEE Directive introduces a requirement for each producer to provide a FG. The intention is that a FG is in place to pay for Producer A's WEEE in the situation where he left the market, either through choice or due to insolvency. Several forms of FG are listed within the legal text as examples (see above) and it should be noted that the wording implies that the guarantee could be either individual or collective. Under the current UK market share system for WEEE, the costs of treating producer A's products are shared between those producers that are putting products on the market within that product category at the time producer A's products arise in the waste stream. This is because under a market share system, the cost of treating WEEE arising (of all brands) is borne by the producers currently existing on the market. As a result, producers do not need an individual financial guarantee under the UK's current market share system. Membership of an approved PCS will suffice.

There is some debate within the literature about the issues surrounding financial guarantees and IPR, notably:

1. The need to ensure that equivalent financial guarantees are provided by producers selecting collective take-back and those opting for individual take-back, in order to create a level playing field;

2. The role financial guarantees could play in providing incentives for DfRR. This is covered further in Section 7.3.

Figure 6.1: Financial guarantees: creating a level-playing field



Ref: EPR for WEEE: Experiences in Europe, Naoko Tojo, IIIEE, Lund University, July 2011. Note original source stated by N. Tojo as Van Rossem, Tojo & Lindhqvist, 2006

Reports by the IIIEE[62], Okopol[63] and the INSEAD IPR Network argue that requirements for financial guarantees should be applied equally to producers regardless of whether they choose collective or individual take-back systems. Okopol's review of requirements within Member State WEEE legislation found that most accepted membership of a collective scheme as a satisfactory financial guarantee whereas those wishing to undertake their own take-back (if this was an option) must have either a blocked bank account or recycling insurance. According to the INSEAD IPR Network, this additional financial burden for producers choosing to set up an individual system or limited brand compliance scheme has been cited by producers as a key barrier to the adoption of approaches fulfilling the aim of IPR. This leads to their recommendation that "In order to ensure a level playing-field, the requirements for a financial guarantee should be the same for producers choosing to join a collective scheme and producers choosing to develop individual systems of compliance"[64].

Financial Guarantees within the current UK Market Share System

The current UK WEEE system is based on (a) market share and (b) mandatory PCS membership. Under a market share system, the cost of treating WEEE arising (of all brands) is borne by the producers currently existing on the market and registered with the

[62] Lost in Transposition: a study of the implementation of IPR in the WEEE Directive, IIIEE, 2006. Page vii. http://www.greenpeace.org/international/Global/international/planet-2/report/2006/10/lost-in-transposition.pdf
[63] The Producer Responsibility Principle of the WEEE Directive, August 2007, Okopol, IIIEE and RPA, P. XX. http://ec.europa.eu/environment/waste/weee/pdf/final_rep_okopol.pdf
[64] IPR: A Review of Practical Approaches to Implementing Individual Producer Responsibility for the WEEE Directive, INSEAD IPR Network, INSEAD Working Paper, 2010, p. viii. http://www.insead.edu/facultyresearch/research/doc.cfm?did=45054

Environment Agencies at any time. As a result, producers do not need to provide individual financial guarantees under the UK's current market share system. Membership of an approved PCS will suffice.

The lack of any specific requirement for a financial guarantee from a producer within a PCS is predicated on the assumption that if a producer withdraws from the market, is unable to pay and/or becomes insolvent, the remaining producers within the PCS will remain solvent and will have sufficient capital adequacy between them to meet the additional financial costs arising from the additional proportion of WEEE now allocated to them by the PCS.

Potential financial risks of the current UK Market Share System

One of the key financial risks arising from the present UK system is the potential solvency of the PCS and/or their producer members at any given time. In the case of producers who have set-up their own PCS, the producer and their PCS are essentially one and the same.

Some stakeholders regard the current lack of actual financial guarantees from each producer to be inadequate and high risk, even under a market share system. As can be seen from the TXU Europe Group case study[65], the impact of a one-off event can be significant. It is important that regulators fully understand, appreciate and effectively monitor the risk exposure being taken-on under a market share arrangement. It is necessary to identify: What is the probability factor of the risk actually arising or the severity of the financial impact thereafter or both and what levels of risk are they, as regulators prepared to accept? For example,

1. What would happen if a dominant player in a product category suddenly withdrew from the market or was unable to pay or became insolvent; would the remaining producers be able to absorb the additional WEEE costs between them and is there the possibility of a contagion risk arising?

2. If a product category began to develop technical convergence with another category, could this leave a minority of 'old style' producers left to fund a large bill for WEEE arising within the now defunct product category?

However, the alternative view is that increasing the requirements for financial guarantees would place a high additional cost on producers and is unnecessary for those joining collective schemes as scheme members already provide a form of mutual guarantee. It is worth noting that the more narrowly a product category is defined, the higher both risks become, so arguably the broader product categories in the WEEE recast may reduce the risk for de facto FGs provided by collective schemes e.g. under a market share system.

[65] The failure of TXU Europe Group and the shortfall of funds in the Renewables Obligation (RO) buy out fund. There are possibly parallel lessons to be learned from this for PCS schemes. See http://www.wragge.com/alert_4334.asp for details.

Financial Guarantees within a WEEE System based on Article 8.2

The text within Article 8.2 of the WEEE Directive states that the guarantee may take the form of participation by the producer in appropriate schemes for the financing of the management of WEEE, a recycling insurance or a blocked bank account.

In order to address this, several potential options are open to an individual producer under Article 8.2 e.g.

- Each producer sets sufficient funds aside in a blocked bank account, or alternatively, a producer can ask their bank to provide a surety bond in favour of a designated third party or a standby letter of credit[66]. This effectively achieves the same result.

- Each producer could form a reciprocal commercial agreement with other producers within the same product category guaranteeing that they will bear the costs relating to that producer's WEEE in the event that they become insolvent, in effect a form of self insurance. However, the issue of a producer withdrawing from the market still remains relevant under such an arrangement and as such, this option could form part of a hybrid solution.

- The producer takes out recycling insurance if this product set is available.

The Swedish WEEE system provides the most comprehensive experience of FGs within any EU Member State to date. Further details can be found under the Swedish case study in Annex A. In addition, an overview of FG options operating in Sweden and their comparative costs is provided by the INSEAD IPR Network (2010).

Potential transferable opportunities and/or applications for the UK

The Chair of the IPR WG undertook a teleconference with a major insurance broker. From these discussions, it is unclear if recycling insurance could become a cost-effective FG option in the UK. Would any underwriters have an appetite for this type of risk and would the premiums payable be commercially attractive to either party for the level of cover and risk taken on?

Other FG options available to a PCS and/or Regulators could include:

- A request for a payment upfront and/or in advance from producers where their credit worthiness is in doubt.

[66] A surety bond and/or a standby letter of credit may need to be supported by cash collateral provided by the producer or alternatively, if the producer has agreed bank limits in place, these facilities will have to be accommodated from within them.

- The provision of a surety bond[67] and/or standby letter of credit by the producers bank in favour of the PCS and/or Regulator whether supported by a) a blocked bank account and/or b) an adjustment in any bank headroom limits marked.

- The payment of a levy by all producers linked to their EEE placed on the market to an external third party. In effect, this gives rise to a 'self administered insurance fund' in all but name. These funds will need to be ring fenced from the normal operations of any third party set up to run and manage the fund.

Further investigations to ascertain the type and cost of potential guarantees for the UK market would be needed before a judgement can be made on the impact of more stringent financial guarantee requirements on UK producers.

6.9 Accruals

A producer which has a legal obligation under WEEE legislation to finance the costs of collecting and treating WEEE must account for these costs within their balance sheet. To do this, the producer must make a provision or accrual under the rules set out within International Accounting Standard (IAS) 37 on Provisions, Contingent Liabilities and Contingent Assets[68]. The way the WEEE legislation is formulated (i.e. market share, return share, payment for own WEEE) will determine the extent and timing of the liability on the producer and hence the level of accrual which needs to be made.

IAS 37

"The objective of IAS 37 is to ensure that appropriate recognition criteria and measurement bases are applied to provisions, contingent liabilities and contingent assets and that sufficient information is disclosed in the notes to the financial statements to enable users to understand their nature, timing and amount. The key principle established by the Standard is that a provision should be recognised only when there is a liability i.e. a present obligation resulting from past events. The Standard thus aims to ensure that only genuine obligations are dealt with in the financial statements – planned future expenditure, even where authorised by the board of directors or equivalent governing body, is excluded from recognition.[69]

An accrual must be made in a company's accounts for each relevant measurement year. Accruals are accounted for and/or are adjusted on a cumulative basis subject to a review between the auditor and management each year.
Accruals have a direct impact on a producers Profit and Loss (P&L) account. Any sum set aside by a company for accrual purposes will have an impact on the reported profits for that company although not on its free cash. The extent of this impact will depend upon the nature of the company e.g. listed/not listed, large/small.

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[67] See by way of an analogous example, arrangements in place with the Environment Agency in respect of landfill aftercare liabilities http://www.environmentagency.gov.uk/static/documents/Business/Guidance_-_financial_provision_for_landfill.pdf
[68] http://www.iasplus.com/en/standards/standard36
[69] http://www.iasplus.com/en/standards/standard36

Accruals under a market share system

The issue of when producers need to make an accrual to cover their liabilities for WEEE under a collective producer responsibility system[70] (as is specified for historical waste under the EC WEEE Directive) is clarified by 'IFRIC Interpretation 6: Liabilities arising from Participating in a Specific Market—Waste Electrical and Electronic Equipment in 2005' (IFRIC 6)[71].

> "*IFRIC 6 clarifies when certain producers of electrical goods will need to recognise a liability for the cost of waste management relating to the decommissioning of waste electrical and electronic equipment (historical waste) supplied to private households. The IFRIC concluded that the event giving rise to the liability for costs of such historical waste, and so its recognition, is participation in the market during a measurement period, i.e. a period in which market shares are determined for the purposes of allocating waste management costs. The IFRIC decided that it is this date, rather than the date of production of the equipment, that is the triggering event for liability recognition.*" IASB Press Release, 1 September 2005[72]

According to IFRIC 6, if a producer's WEEE obligations are set under a market share system (as is currently the case under the UK WEEE Regulations), then producers do not need to make any accruals when putting the product on the market because they do not incur the liability at this time. If they withdraw from the market, they will hold no liability for treating the products they have already put on the market as these costs will be shared out amongst the remaining producers. Therefore under a CPR system, producers only need to make accruals for the next compliance period[73] as this is when they will incur liability for WEEE costs[74].

Accruals under an IPR system

IFRIC 6 does not cover the issue of accruals for producers operating under WEEE legislation and adopting an IPR financing mechanism. It therefore does not apply to the WEEE Directive's Article 8.2 requirements for new WEEE. This is because IFRIC felt that these accruals requirements were already adequately provided for by IAS 37. If WEEE legislation enables producers' to be responsible for financing the collection and treatment of their own brand products and this liability is incurred at the point of placing the product on the market, then under the rules of IAS 37 the producer must make an accrual for the relevant costs at this time.

An auditor, in discussion with management, would seek assurances on a) material data about the items of EEE placed on the market, b) their expected lifecycle and/or durability and c) relevant collection/treatment costs so that the extent of any accruals liability can be

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[70] Also referred to as CPR in this section.
[71] http://www.iasplus.com/en/standards/interpretations/interp7
[72] http://www.iasplus.com/en/binary/pressrel/0509ifric6.pdf
[73] It is up to the Producer and their auditor to determine what is a reasonable sum to set aside for accrual purposes for any given measurement period.
[74] For a full description of this issue, see Deloitte IAS Plus Special Edition September 2005 http://www.iasplus.com/en/binary/iasplus/0509ifric6.pdf

properly determined and a judgement view formed by the company's auditor in consultation with management.

Accruals within mixed CPR/IPR Systems

If a national WEEE system provides for and enables both CPR and IPR elements it can be difficult to determine the boundaries where IFRIC 6 is applicable or not and where IAS 37 is applicable or not. For example, if national WEEE legislation incorporates the transposition of Article 8.2 for new WEEE but there is an opt out which enables PCSs to continue to allocate costs on a market share basis then a situation can arise whereby producers who are PCS members do not make accruals at point of putting a product on the market whereas those producers undertaking their own take-back under IPR do make accruals at the point of putting a product on the market[75].

IPR - Financial Impact arising from Accruals and Financial Guarantees

Accruals and financial guarantees are two distinct and quite separate matters. A financial guarantee as required for new household WEEE under the WEEE Directive is intended to ensure that if a producer is unable to meet their financial obligations e.g. due to insolvency, there is protected financing available to cover the costs. Hence it is a mechanism for ensuring that any orphan WEEE arising can be financed.

In contrast, an accrual or provision is not required by the WEEE Directive, it is an accounting requirement to ensure that a company has properly provided for the costs of future liabilities within its financial statements. Accruals and financial guarantees can be interlinked but are not interchangeable. Hence a key issue is the economic impact on producers under an IPR system which will require an accruals policy to be put in place by the company and a financial guarantee from the point of putting a product on the market.

This raises the question, how is the requirement for an accrual affected by the existence of a risk transfer mechanism put in place in lieu of a financial guarantee? For example, if a producer has taken out recycling insurance to underpin their financial guarantee requirements, does this mitigate the need for a full accrual to be made under IAS 37 given that an insurance policy is in place to cover their future liabilities?

Initial investigations by the IPR WG indicate that no mitigation of the accruals requirement is possible. For example:

- FG provided via recycling insurance: a recycling insurance policy will not be recognised as an asset until the cash proceeds from the insurance policy have been paid out and received by the company;

[75] For a full discussion see pages 6-7, UNICE contribution to the Roundtable on Consistent Application of IFRS, 20 September 2006, http://ec.europa.eu/internal_market/accounting/docs/ias/roundtable/060920issues-paper.pdf. Also pages 242-244, Individual Producer Responsibility in the WEEE Directive: From theory to practice? Chris van Rossem, Doctoral dissertation IIIEE, 2008, http://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=1266797&fileOId=1266800

- FG provided via a blocked bank account: an accruals liability will still need to be set aside in the first instance although the extent of any accruals liability can be offset by the cash held in the blocked bank account. However, there is an additional impact in that cash held in the blocked bank account is capital that a company cannot use elsewhere in the business.

Potential Option available for Mitigating Accruals

If a producer acting alone or in cooperation with others, wishes to mitigate and/or eliminate the need to account for an accruals liability in its accounts, it is possible to achieve this outcome subject to the following caveats.

1) Establish a separate and independent company that will operate at an arms-length basis.
2) Contracts put in place between the producer/s and the company for the ongoing management of accrued liabilities and costs. In analogous terms, this is a form of self-insurance.
3) All arrangements have to be on a non-recourse basis.

Any producer/s seeking to explore the merits of this option further should take proper professional advice in this matter, including any relevant financial considerations.

6.9 Summary

Implementing IPR in European Member States needs to consider and meet the requirements of the WEEE Directive. Key aspects and implications for IPR systems are summarised below.

- Product Scope:
  - The scope of the European WEEE Directive is broader than any other WEEE legislation globally. The products and their market conditions vary considerably. This raises the following questions: As it is possible to meet Article 8.2 requirements via a variety of systems, is it appropriate to apply a single financial allocation model to all WEEE or could variants be used per product category? What scope is there for flexibility to allow different compliance routes? Should a new system be phased in targeting the most appropriate product categories first?
- Product Categories:
  - Product categories are important because in a market share or simple return share system they are the primary cost differentiator. Typically producers are charged a flat fee per tonne within a product category. This can lead to significant discrepancies depending on how the product categories are set. The more homogeneous the product category in terms of materials and treatment costs, the closer the match is likely to be between actual end of life costs for a particular product and fees charged by compliance schemes for that product category;
- Collection Targets:
  - The recast WEEE Directive will establish challenging new collection targets. This has two implications from an IPR perspective: (i) any changes to the current UK

system will need to ensure that high levels of collection are achieved in line with the targets; (ii) a new approach could be considered which sets producers' WEEE tonnage obligations based on a percentage POM basis designed to meet the overall collection target set in the WEEE recast (initially 45% POM);

- New vs Historic WEEE:
  - Article 8 of the WEEE Directive specifies an IPR financing model for 'new' WEEE and a CPR financing model for 'historic' WEEE. For some product categories with shorter lifespans, the amount of historic WEEE arising may be negligible and a single financing mechanism based on IPR may now suffice. For products such as LDA this is not yet likely to be the case.
- Definition of Producer:
  - Identification of the producer in order to allocate end of life costs for own brand products is a key element of some IPR systems. Due to the definition of 'producer', WEEE arising bearing a single brand name may have been POM by a number of different producers. How to allocate responsibility between multiple producers for a single brand is therefore a key challenge for IPR.
- Producer marking & Brand identification:
  - Back-end IPR systems typically rely on identifying the brand on WEEE arising. This means that either (a) the brand or producer's name must be clearly and indelibly marked on the product so that it can be clearly identified at end of life or (b) some form of bar code or RFID identification system needs to be in place. The recast WEEE Directive does not adequately mandate this nor does the RoHS Directive, which could prove a key challenge for return share systems in the UK unless addressed via other legislation or standards.
- Financial Guarantees:
  - Article 8.2 of the WEEE Directive introduces a requirement for each producer to have a financial guarantee. A financial guarantee is intended to ensure that if a producer leaves the market, their WEEE costs are not borne by the other producers or by the state. Reports by the IIIEE, Okopol and the INSEAD IPR Network argue that requirements for financial guarantees should be applied equally to producers regardless of whether they choose collective or individual take-back systems.
  - Some stakeholders regard the current lack of actual financial guarantees from each producer to be inadequate and high risk, even under a market share system. However, the alternative view is that increasing the requirements for financial guarantees would place a high additional cost on producers and is unnecessary for those joining collective schemes as scheme members already provide a form of mutual guarantee. Whilst experience of FGs is available in Sweden, further investigations to ascertain the type and cost of potential guarantees for the UK market would be needed before a judgement can be made on the impact of more stringent financial guarantee requirements on UK producers.
- Accruals
  - An accrual is not required by the WEEE Directive, it is an accounting requirement to ensure that a company has reflected the costs of future liabilities within its P&L. Any sum set aside by a company for accrual purposes will have an impact on the reported profits for that company although not on its free cash. The extent of this

impact will depend upon the nature of the company e.g. listed/not listed, large/small.

- The way the WEEE legislation is formulated (i.e. market share, return share, payment for own WEEE) will determine the extent and timing of the liability on the producer and hence the level of accrual which needs to be made. If WEEE legislation mandates that producers' are responsible for financing the collection and treatment of their own brand products and this liability is incurred at the point of placing the product on the market, then under the rules of IAS 37 the producer must make an accrual at this time.

- Accruals and Financial Guarantees
  - Accruals and financial guarantees are two different requirements and are not generally interchangeable. When assessing the economic impact on producers of any WEEE system, it is necessary to consider the impact of both financial guarantees and accruals. The largest impact would be caused by an IPR system which required both accruals and a financial guarantee from the point of putting a product on the market.

7 DfRR as a result of IPR: fact or fiction?

The theory behind IPR is that in making producers financially responsible for their own products at end of life, they are given a direct economic incentive to improve the design of their products in terms of durability, re-use, repair, upgrade and/or recycling. This section explores the evidence for this and discusses the key influencing factors.

This section discusses:

- The theory and the evidence regarding the link between IPR and DfRR;
- The UK's objective with regard to an IPR Solution;
- The value of DfRR payback;
- Factors that affect the impact of DfRR payback.

7.1 Theory and Evidence

There are many quotes from experts and stakeholders alike that reiterate and support the theory that:

> *"Individual Producer Responsibility provides a competitive incentive for producers to design their products so that they are easier and therefore cheaper to recycle … Without IPR, the WEEE Directive is failing its main objective: to establish an incentive for producers to design products for easier recycling."* ERP, 2007.

However, other experts dispute this:

> *"With regard to the Design for Recycling impact [of the EC WEEE Directive], there is no industry-wide evidence provided, on the contrary, there is no evidence that it has occurred or ever will occur as a common practice."* J. Huisman et al, United Nations University, 2007.[76]

[76] Review of Directive 2002/96 on Waste Electrical and Electronic Equipment - Final Report – Study No. 07010401/2006/442493/ETU/G4, J. Huisman et al, United Nations University, P. 298-299, 2007. http://ec.europa.eu/environment/waste/weee/pdf/final_rep_unu.pdf

The IPR WG recognised the need to evaluate whether there is any evidence of the relationship between IPR and DfRR (Design for Re-use, Repair, Upgrade and/or Recycling) beyond the theoretical concept.

- Can an IPR system *reward* producers who have designed products with improved environmental impacts at end of life?

- Can an IPR system *incentivise* DfRR and cause market transition to products with improved environmental impacts at end of life?

Examining experience in other EU Member States provides no direct evidence to date, primarily because few MS have implemented an IPR system in practice. For those countries that have transposed and potentially implemented Article 8.2 correctly, the IPR Working Group has not been able to identify any English language literature which has explored the impacts on product design or environmental benefits. There are also two additional factors which limit the possibility of obtaining clear evidence:

(a) EEE products are designed globally or for regional markets - any impacts from a single MS WEEE system on product design are likely to be limited unless it is a major market; and

(b) "IPR does not act as a prescription but as a way to encourage/incentivize design initiatives for end of life management, so it is difficult to put a direct quantifiable value on such a principle today" [77].

Examining evidence from IPR systems globally points to the Japanese HARL and PC systems. There is anecdotal evidence indicating that producers of home appliances in Japan, and producers of cars in Sweden, developed products to be more easily recyclable *in anticipation* of EPR legislation rather than as a direct result of implementation (Tojo 2004). This was confirmed by Chris van Rossem, "companies developed pilot products with improved disassembly in anticipation of EPR". After implementation of the Japanese HARL, it was found that the direct involvement of producers in recycling activities provided significant learning opportunities for how to improve the design of products to improve end of life treatment (Tojo, 2006[78]). Research by K.Hosada (2004) found that design improvements had been made in 2 key areas: ease of disassembly and uniformity of plastic resins. It is interesting to note that at that time the DfRR incentive may have been weakened by the fact that according to Tojo (2006[79]) there was no cost differentiation between brands/models amongst manufacturers in the same group. There were differences "depending on when products were manufactured but not so much between brands".

In terms of the US WEEE systems, no published research on DfRR impacts was identified by the IPR WG. Magalini commented in his interview for the IPR WG that he could "not

[77] Stephane Arditi, EEB, interview with IPR WG, June 2010.
[78] EPR Program for EEE in Japan: Brand separation? N. Tojo, IIIEE, 2006. http://www.iprworks.org/documents/file/EPRprogramforEEEinJapan.pdf
[79] Ibid.

see any design changes" that had resulted from the US WEEE systems. However, it is interesting to note that in Maine (which operates a return share system for monitors and desktop printers with the option for producers to have their own brand products separated in order to undertake their own treatment), 13 producers have opted to separate their own brand products and undertake their 'own' recycling[80]. This may indicate that the current level of DfRR payback obtainable for those brands, within that product category, is sufficient to cover the additional costs of segregation, separate transport and treatment and that they have sufficient volumes to ensure economies of scale. It is unknown if this could be extrapolated to other forms of WEEE within more mixed collection categories as per the current UK context.

The Experts' View

Atsuhiko Sano interview:

- Mandatory IPR for small business operators and new entrants would possibly become a severe barrier to market entry and it is important to consider this in designing the scheme. I agree with the theoretical benefit of IPR and that the responsibility on the producer should be clear in order to link cost and design. In the Japanese HARL system, there has been minimal positive influence between the operation of recycling facilities and the design of EEE[81].
- Establishing a recycling rate target does affect the cost of recycling. In this respect, it is important to ensure that any recycling rate is achieved at a minimum cost, rather than to just seek the highest rate of theoretical recycling.
- By sharing WEEE recycling and recovery facilities (RRF's) with other end of life goods, it is possible to promote their importance and the way in which they might contribute to improving social efficiency in recycling as a whole.

Stephane Arditi interview:

- "IPR has not been so far fully implemented and documented in Europe: it is not easy to assess the economic results. The point is IPR has not yet been comprehensively deployed (from products properties identification, through return rate consideration, through recycling and treatment standards to associated financial obligations)."

C van Rossem & Carl Dalhammar[82]:

- "The implementation of the WEEE Directive to date has not provided the incentives for design for end-of-life as originally perceived by policy-makers. The main principle to achieve this, namely individual financial responsibility through

[80] See: http://www.maine.gov/dep/waste/ewaste/documents/option1mfrs112811.pdf

[81] The Chair of the IPR WG sought to explore this statement further with Mr Atsuhiko Sano and he confirmed that there had been some product design changes undertaken by producers although these were minor. In part, this is due to the fact that only 4 product categories are mandated and in terms of design, are relatively mature already.

[82] Designing Greener Electronic Products: Building synergies between EU Product Policy Instruments or simply passing the buck?, IIIEE report for EEB, 2010, Page 6 http://www.eeb.org/?LinkServID=66030392-BF80-2CAC-B5335569F1526F90&showMeta=0

The Experts' View

individual producer responsibility (IPR), has not been transposed properly by many Member States, neither have compliance schemes implemented the concept in actual financial fee structures for producers."

Atalay Atasu[83]

- "It is not reasonable to look for DfRR evidence in collective systems where volume/weight based cost sharing is in practice. With volume/weight based cost allocation procedures it is natural to expect minimal design incentives because such cost allocations are likely to allow free-riding on other's design improvements. The limited evidence for DfRR improvements is most likely an outcome of the lack of IPR in these implementations."

C van Rossem, N Tojo, T Lindhqvist[84]:

- "Existing research shows that EPR laws do prompt eco-design changes. The drivers of eco-design are strengthened when there is feedback on the total end-of-life costs to individual producers: namely collection, dismantling, re-use and high-levels of material recycling. Existing EPR programmes for WEEE and ELV show that implementing IPR (individual producer responsibility) is possible. What is also evident is that for products such as cars and EEE, these changes have to date been more the result of anticipating such regulatory requirements than the actual incentives that are provided when the EPR programme is implemented and in operation."

Implications for the UK WEEE System

Given that the UK WEEE system should meet the requirements of the WEEE Directive, it could be argued that meeting Article 8.2 should be the primary focus. However, it is important to ask:

a) Is the aim purely to ensure that producers pay the costs relating to their own WEEE as specified in Article 8.2?

b) Is the aim to ensure that producers are rewarded for design changes which result in environmental benefits at end of life? Secondly, does this reward need to be sufficient to drive market transition?

Given the lack of comprehensive evidence, it should not be assumed that (a) will lead directly to (b) in all cases. If there is a design change which results in environmental benefit and carries *significantly* lower collection and treatment costs then both aims can be

[83] Pers Comm, Atalay Atasu, May 2012. Statement based on Extended Producer Responsibility for E-Waste: Individual or Collective Producer Responsibility? Atalay Atasu & Ravi Subramanian, 2012

[84] Note emphasis has been added for the purposes of this report. Source of quote: Extended Producer Responsibility: An examination of its impact on innovation and greening products, C Van Rossem, N Tojo, T Lindhqvist, IEEE for Greenpeace International, FoEE and EEB, 2006, p. IX http://www.productpolicy.org/ppi/attachments/EPR-and-Eco-Design_2006.pdf

met simultaneously. However, if a design change reduces environmental impacts at end of life but does not lead to significantly lower treatment and recycling costs (or costs more to change than can be recouped) then only (a) is met.

Another limitation of focusing purely on Article 8.2 is that it cannot address trade-offs between environmental impacts. For example, if a product is more durable but less energy efficient during use. There may be some improvements to end of life environmental impact which from a policy perspective should not be incentivised within the WEEE system because this would result in a negative overall life cycle environmental impact. Expert opinion on how this would be experienced in practice is divided; Huisman et al think it is significant and argue that Eco-design and Waste Management goals should be split between the Eco-Design and RoHS Directives on the one side and the WEEE Directive on the other. In contrast, interviews conducted by Tojo found that Swedish and Japanese companies were well versed in life cycle environmental impacts and would balance any trade-offs themselves.

The Experts' View

J. Huisman et al, United Nations University[85]:

- "For instance (smaller) LCD monitors use less energy in the use phase compared to CRT screens, which prevails from an environmental point of view over the risks in recycling of the mercury containing backlights. … Basically, the Hg-backlights case is a perfect example why the EPR provision with regard to DfR does not work in practice."

Chris van Rossem[86]:

- "Tojo (2004) conducted an empirical study in 2000-2001 which investigated the impact of EPR legislation for vehicles and electronics on manufacturers' product design and other environmental measures in Japan and Sweden. … A particularly important finding in this research was that the design for end of life measures reported by manufacturers have been integrated into other design strategies. When competing with other environmental priorities, careful consideration has been made so as not to increase the environmental impact from other phases of the life cycle at the expense of design for end of life (Tojo, N, 2004[87])."

It can be concluded that making producers pay the costs relating to their own WEEE will *in some instances* create no DfRR incentive or environmental benefit at all. It is against this context that Mayers argues "the question producers should ask themselves in developing their approach to EPR for WEEE in Europe is perhaps not "How do we implement individual responsibility for our branded products?" but "How do we secure financial

[85] Review of Directive 2002/96 on Waste Electrical and Electronic Equipment - Final Report – Study No. 07010401/2006/442493/ETU/G4, J. Huisman et al, United Nations University, P. 298-299, 2007. http://ec.europa.eu/environment/waste/weee/pdf/final_rep_unu.pdf

[86] Individual Producer Responsibility in the WEEE Directive: From theory to practice? Chris van Rossem, Doctoral dissertation IIIEE, 2008.

[87] Extended Producer Responsibility as a driver for design change: Utopia or reality? N. Tojo, IIIEE, 2004

advantage from our improved designs?"[88]. Similarly Huisman and Magalini state that the focus should not be on IPR per se but that "the challenge is to financially reward producers for good practice".

7.2 Value of DfRR to Producers

Another key question in this debate is what level of payback can DfRR deliver? After all, *if* the majority of DfRR improvements were to lead to negligible reductions in end of life costs for WEEE[89] then arguably implementing Article 8.2 would do little to incentivise change and would not be able to deliver environmental benefits at end of life. To answer this question, one would need to examine the range of DfRR improvements for each category of household EEE and their cost implications in terms of the cost to make the change versus the reduced costs or benefits at end of life.

This task was outside the scope of the IPR WG's available resources. Given the rate of technology change within the EEE sector and developments in recycling methods any such study would, in any case, illustrate only a snapshot in time. Based on the Group's combined knowledge of the EEE sector, re-use and recycling industry it is fair to conclude that **the value of DfRR payback will vary by product, change over time and be dependent on secondary factors such as availability of raw materials and market conditions.**

Impact of Secondary Factors

It is worth noting the impact of these secondary factors on the level of DfRR payback, primarily:

- Treatment requirements and Recovery targets
- Precious and special metals

Treatment Requirements and Recovery Targets

WEEE Directive Requirement	Implications for IPR
Treatment Requirements The recast WEEE Directive states that minimum standards for the treatment of WEEE should be developed at EU level. Under the current Directive, Member States have set their own treatment requirements.	Treatment requirements set within the context of an IPR system could significantly affect the value of financial payback from DfRR improvements.

[88] Mayers, C.K. 2007. Strategic, Financial, and Design Implications of Extended Producer Responsibility in Europe: A Producer Case Study. Journal of Industrial Ecology 11 (3): 113-131.
[89] Reports by Eikelenberg (2003) and Huisman (2003, 2004) found that "the environmental room for improving the EOL phase of most mainstream products is very limited". This is refuted by other stakeholders.

WEEE Directive Requirement	Implications for IPR
Recovery Targets The existing requirements set recovery and recycling targets of between 50% - 80% for most product categories. The new requirements under the recast will cover all product categories and all targets will be increased by 5% after three years. Within 4 years, the Commission will examine the case for a mandatory 5% reuse target.	Within an IPR system, both re-use and/or recycling targets could affect the value of financial payback from DfRR improvements.

Do DfRR changes result in real and significant differences in EOL costs compared to the level of investment required to make the changes during design and production? As discussed, this will vary on a product by product basis but on a generic level it will be influenced by (a) treatment requirements and (b) recovery targets. For example:

- If there was a pre-treatment requirement which mandated the removal of a particular hazardous component at end of life this would potentially increase the payback (i.e. reduce the overall treatment cost) for products which had been designed for disassembly;
- If the recycling target was particularly challenging for a specific product category, more effort would need to go into increasing material separation and recycling. Products which had fewer material types each in a more homogenous form (e.g. without paint or coatings) would be cheaper to treat in this circumstance.

Precious and Special Metals

"*Raw materials like Copper, Tin, Aluminum, Gold, Yttrium are not a concern for manufacturers of electronic products today as they represent on average less than 5% of the production cost. This is going to change as demand will increase and cost of the materials will rise … putting them more into the focus of the electronic companies. In the next couple of years, these companies will include access to affordable raw materials into their major strategies*"[90]. Klaus Hieronymi, Hewlett-Packard

There is growing concern about the long-term availability of specific groups of precious and special metals for EEE production, notably Platinum Group Metals (PGM) and Rare Earth Elements (REE), in terms of both access and rising costs[91]. These substances, although used in small amounts, are critical for the functioning of many types of electronic equipment. Using recovered metals has been identified as a key strategy for addressing future supply risks alongside efforts to secure the supply of virgin materials and the use of

[90] Raw Material – The Next Big Battle? K. Hieronymi, Hewlett-Packard, CARE Innovation 2010.
[91] The EU Raw Material Initiative (RMI) identified 14 critical materials which combine high economic importance to the EU with a high risk of potential disruption to or interference in supply – many applicable to the electronic sector. For more information on the RMI see http://ec.europa.eu/enterprise/policies/raw-materials/critical/index_en.htm

alternative substances or technologies. As a result, several research projects[92] have been undertaken to examine the potential for increasing the recovery of these substances from WEEE and other sources.

"*We estimate that between now and 2020, in the UK, we'll dispose of 12 million tonnes of WEEE. A quarter of this will comprise IT equipment, consumer electronics and display devices, which in turn, will contain around 63 tonnes of palladium, and 17 tonnes of iridium. At current market prices, this amount of palladium would be worth £1 billion, and the iridium, around £380 million*"[93]. WRAP

This highlights that in future there may be increased economic incentives or mandatory treatment requirements to disassemble and remove key parts containing PGM and REE (e.g. medium and high grade circuit boards, LCD screens, brominated plastics) from equipment prior to shredding. DfRR changes which enable re-use or facilitate recovery of PGM and REE may provide increased payback. Thus 'ease of disassembly' and 'identification and access to key components containing REE and PGM' may become more important DfRR criteria in future than under the current treatment regime. There may also be growing demand from producers to be able to physically access their 'own' WEEE in future, in order to facilitate the potential for closed loop recycling.

7.3 Impact of DfRR payback

Following on from the question 'What level of DfRR payback exists', is the related issue of what secondary factors affect the *impact* of DfRR paybacks on producers and need to be taken into consideration when designing a new approach. The three key factors here are:

- Point of Payment/ Return on DfR;
- Applicability to all versus optional access to own WEEE;
- Number of producers within a product category who are purely importers and have no close links with the original manufacturer. Such importers may have limited ability to select products on the basis of certain DfRR features even where significant payback exists.

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[92] Recycling: From E-Waste to Resources, 2009, UNEP. Pages 7-10. http://www.unep.org/PDF/PressReleases/E-Waste_publication_screen_FINALVERSION-sml.pdf
- UNEP, http://www.unep.org/resourcepanel/Portals/24102/PDFs/Metals_Stocks_Press_Release.pdf;
- WRAP IMT002-001 Final Report, http://www.wrap.org.uk/sites/files/wrap/IMT002%20Strategic%20Raw%20Materials%20Capacity%20Report%20-%2027th%20March%202012.pdf
- Study into the feasibility of protecting and recovering critical raw materials, 2011, Oakdene Hollins for the Environment Agency. http://www.environment-agency.gov.uk/static/documents/Business/EPOW-recovering-critical-raw-materials-T5v2.pdf
- Metal Recycling Challenges from Waste Products in Japan, 2011, Kyoto University. http://www.ctci.org.tw/public/Attachment/112111194871.pdf

[93] http://www.wrap.org.uk/content/product-re-use-could-hold-key-issues-resource-security-says-wrap

Point of Payment / Return on DfRR

As illustrated in Section 5, WEEE systems may be based on front end payment (where producers pay at the point of placing EEE on the market) or back-end (where producers pay when products are collected as WEEE). Front end systems provide an immediate payback where one is realisable. In comparison, the impact of any DfRR incentive provided via a back-end system may be diluted. This is a particular problem for household EEE with long lifetimes such as LDAs. According to a major LDA manufacturer, "Today the average expected life cycle of [LDA] products in all European countries is 15 years and more. The amortization of investments in R&D product design for a better recycling would therefore take 15 years too – subject to actually being able to realize the future value of the returned product"[94].

The Experts' View

J. Huisman interview:

- There is a long residence time between design, use and waste therefore delayed incentives + future technologies unknown.

Magalini interview:

- "If design is to be improved we need to find the right policy tool to concentrate on that issue. Using end of life to do this takes too long"

Chris van Rossem:

- "Net present value of future savings in end-of-life costs may be too low to justify current design investments (delayed incentive)"[95]
- Any IPR benefits come at end-of-life. With longer product life, IPR economic benefits from reduced end-of-life costs could be negated when a discount rate is applied to the current investment costs associated with a design improvement. [BUT] It will become evident in the future how to address the extended payback period. There could be an artificial earlier pay back, e.g. differentiated product compliance fees based on end-of-life design criteria. In France fees are differentiated based on if they meet minimum criteria. i.e lower fees for products that have improved end-of-life properties. The key is to differentiate based on when products are placed on the market, not the when they become waste, as it brings the payback forward. E.g. If a laptop had a mercury backlight you would add 20% to the compliance fee - differentiate costs based on design.[96]

Logically, we can assume that any DfRR incentive will have more impact if it is felt at the time of putting the product on the market than if it is only realised at end of life. This points towards a front-end payment system. However, there are additional ways of addressing this problem within back-end systems via the use of financial guarantees.

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[94] Source: IPR WG stakeholder questionnaire response from major LDA manufacturer.
[95] Individual Producer Responsibility: Principle vs Practical Implementation, C van Rossem, 2009, Slide 14. http://www.canadianstewardship.com/2009presdownloads/7vanRossemCanadianStewardship.pdf
[96] Chris van Rossem interview with IPR WG representative, May 2010.

Financial guarantees as a mechanism for rewarding DfRR

If mandatory and equivalent financial guarantee requirements are placed on all producers, they can be either the primary or an additional mechanism for rewarding DfRR, depending on the WEEE system in place and its underlying financial model. If the financial model enables different product properties resulting in lower end of life (EOL) costs to be reflected in the costs to the producers, so the financial guarantee would reflect these differentials. For example:

a) In a return share system where producers pay for their proportion of own products in WEEE arising but are charged a flat fee for a tonne of WEEE within a particular product category there is no reason why the financial guarantee should consider any DfRR features except potentially durability, upgradeability and their impact on product lifetime;

b) If the WEEE system applies cost differentials by brand or product properties, then the financial guarantee should reflect any lower EOL costs resulting from those features;

c) If a WEEE system gives the option for producers to access and take physical responsibility for their own WEEE at EOL, those producers choosing to do so may be able to reflect any lower EOL costs for their own brand WEEE within the financial guarantee for as long as they continue to select this option.

According to the INSEAD IPR Network (2010) there are examples such as the Swedish recycling insurance for end of life vehicles (ELVs) which promotes design for recycling because "the easier the car is to recycle the lower the premium for the insurance"[97].

Applicability to All vs Optional Access to WEEE

The other key factor affecting the impact of DfRR payback is whether it applies to all producers or only some. For example:

a) Some WEEE systems apply any DfRR payback to all producers e.g. in a return share system which charges less for some product types within a category than others the DfRR benefits/penalties are felt by all producers;

b) In a return share system which charges a flat fee per product category but has the option for producers to segregate and separately treat their own WEEE, the DfRR 'benefits' are only open to producers at extra cost. Whilst there is evidence from Maine that these benefits are significant enough to warrant segregation of monitors and desktop printers for several large producers, the DfRR benefits would not be

[97] *IPR: A Review of Practical Approaches to Implementing Individual Producer Responsibility for the WEEE Directive,* INSEAD IPR Network, INSEAD Working Paper, 2010, p. 59. http://www.insead.edu/facultyresearch/research/doc.cfm?did=45054

as readily accessible to smaller brands with less volume and hence fewer economies of scale[98].

Therefore, whilst there are good reasons for enabling producers to access their own WEEE either via segregation within collective collection or via their own take-back channels, it should not be seen as proxy for providing DfRR payback for all producers.

7.4 Conclusions

There are many quotes from experts and stakeholders alike that reiterate and support the theory that *"Individual Producer Responsibility provides a competitive incentive for producers to design their products so that they are easier and therefore cheaper to recycle"* (ERP, 2007). However, other experts such as Huisman and Magalini, dispute this.

This leads to 2 questions (1) what level of DfRR payback potentially exists for household WEEE and (2) can IPR systems access and return this payback to the producer?

(1) The IPR WG could not find a comprehensive review of the range of DfRR improvements for each category of household EEE and their cost implications (i.e. the cost to make the change versus the reduced costs or benefits at end of life). Given the rate of technology change within the EEE sector and developments in recycling methods any such study would, in any case, illustrate only a snapshot in time. Based on the Group's combined knowledge of the EEE sector, re-use and recycling industry it is fair to conclude that **the relative value of DfRR payback will vary per product, change over time and be dependent on secondary factors** such as treatment requirements, re-use and recycling targets.

It is also possible that in future, producers may want to access their own WEEE not only because it may be more cost-effective to treat than mixed WEEE and to reduce their compliance costs but driven also by the need to access the materials contained therein (e.g. known, pure grade recycled plastics, rare earth metals).

(2) Evidence from existing schemes such as the Japanese HARL system and the Maine return share system does indicate that DfRR benefits are being realised. However, the lack of 'Full IPR' schemes globally and the fact that IPR is intended to work alongside other policy tools as an incentive for DfRR makes it difficult to obtain a definitive picture.

Taking all these factors into consideration, a blueprint for an effective WEEE system which maximises DfRR incentives would be a system which:

- Is flexible and will enable DfRR payback to all producers within a product category as and when improved features or technologies which reduce environmental impact at end of life are developed e.g. LED versus mercury backlights within displays;

[98] "the cost savings may not be seen if you do not have the volume", Maine Dept of Environmental Protection, Pers Comm May 2012

- Considers the secondary factors affecting the value of DfRR payback in order to maximise potential environmental benefits e.g. treatment requirements, recycling and re-use targets;

- Ensures as far as reasonably possible that the value of DfRR payback exceeds the costs of implementation for all producers. In other words a system which is costly to implement should not be imposed on all producers if the likely DfRR benefits are small or would only apply to the few;

- Ensures that DfRR payback is available to all producers, large and small;

- Provides immediate DfRR payback, not delayed. Any financial payback to producers based on the DfRR characteristics of the products they POM needs to be immediate to be effective and not rely on long-term feedback loops. The financial payback should not be at the point when that product becomes WEEE as this would delay the impact and reduce the incentive for design change.

- Incorporates the option for producers to access their own WEEE (a) as a route to reduced treatment costs as payback for DfRR investments and (b) in recognition that physical access may become more important in future e.g. as options for closed loop recycling improve and in response to potential sourcing issues affecting special and precious metals.

8. Options Development & Analysis

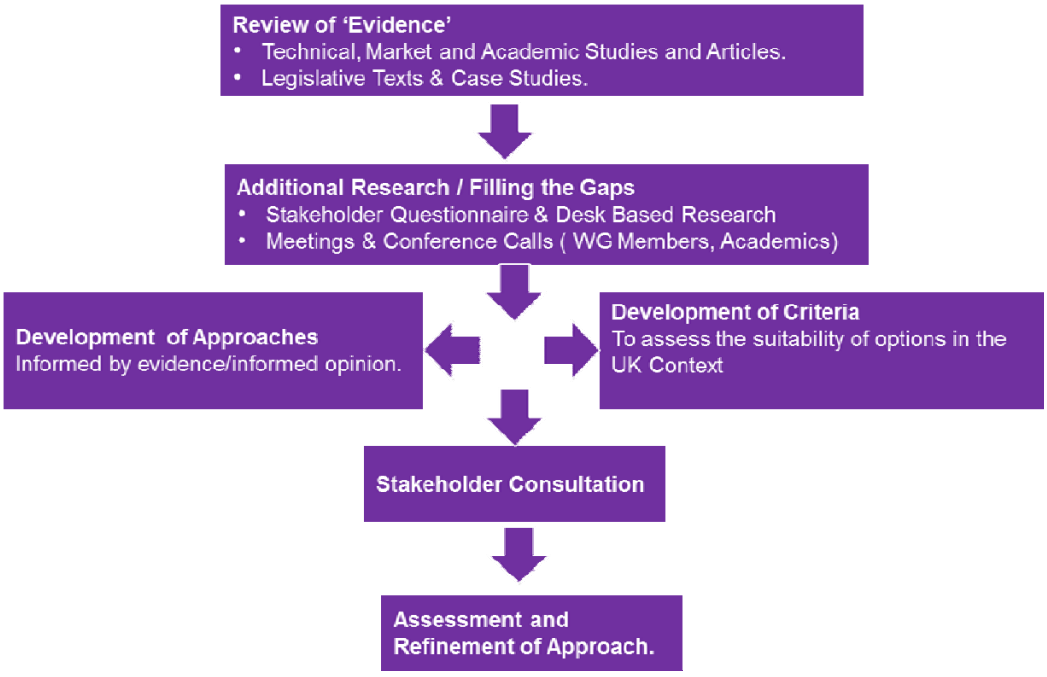
This section presents the methodology used by the IPR WG to identify and analyse a range of potential options for incorporating IPR elements within the UK WEEE system.

This section explains how the IPR WG:

- identified a wide range of potential options based on knowledge gained from the evidence review;
- developed a series of criteria for evaluating these options;
- reduced the list of potential options to a reasonable number for direct stakeholder consultation;
- held a stakeholder event to obtain feedback on the evaluation criteria and selected options;
- refined and weighted the criteria based on stakeholder feedback and subsequently. evaluated the selected options using these criteria.

Figure 8.1 summarises the process.

Figure 8.1: Process Diagram



8.1 Identification of Options

The IPR WG considered it important to identify a wide range of options incorporating different IPR elements and not limit the discussion to 'pure IPR' options. Eleven options were identified covering (a) market share (b) return share and (c) payment for own WEEE (see Section 5 for an explanation of these 3 approaches).

The options were developed during a series of IPR Working Group meetings with assistance from the consultants. The options originated or were adapted from:

- models proposed by experts in published papers;
- models proposed by stakeholders during the initial consultation exercise;
- existing WEEE schemes used in other countries e.g. Japan;
- modifications or variants developed by the IPR WG.

Figure 8.2 summarises these initial options and Table 8.1 provides a more detailed description of each one.

Figure 8.2: Summary of Initial Options

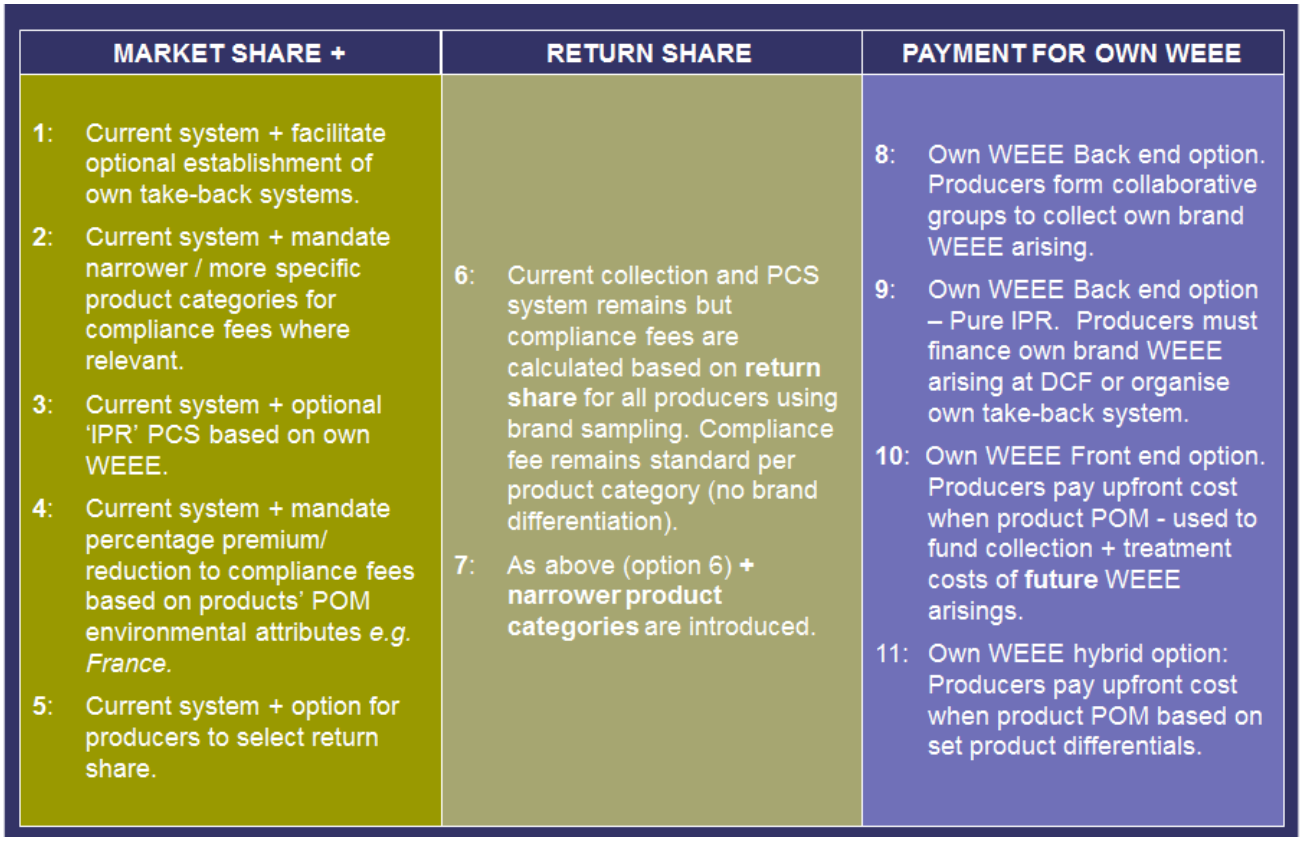


Table 8.1: Description of Initial Options Identified by the IPR Working Group.

Approach	Description
MARKET SHARE: **1. Independent Route.** *The current UK WEEE system is modified to facilitate producers wishing to undertake their own take-back activities.*	• Producers register with a compliance scheme OR opt to undertake their own take-back and register independently. • Producers opting for the 'independent' route must demonstrate they have established adequate collection network (e.g. postal system). Take-back may be only own brand or may cover mixed brand WEEE. • Third parties should not hinder take back activities by the 'independent route' producers. • Producers' obligations would be calculated by market share as at present. However, a set volume could be introduced for the 'independent route' producers, based on the collection targets within the WEEE recast. • All producers need a financial guarantee (intention is to create a level playing field). • Consider mechanisms for over/under collection (e.g. paying standard price for evidence, banking evidence).
MARKET SHARE: **2. Narrower Product Categories.** *The current UK WEEE system is modified by making changes to the reporting categories.*	• Producers' obligations are still calculated by market share. PCS membership and collection channels are unaltered. • Additional product sub-categories are introduced where the cost of treating and recycling is significantly different from the other products in the category. An example could be 'mobile phones' as a sub-category of category 3. PCS charges should reflect the actual costs of collecting and treating products within the sub-category. • The intention is to try and ensure that reporting categories cover relatively homogenous products with similar treatment costs and thus avoid the situation where producers of products with high value or low treatment costs effectively subsidise the costs of other products within the same reporting category (see Section 6.3 on 'Product and Collection Categories' for further explanation and examples).
MARKET SHARE: **3. IPR 'Club'.**	• Two systems would operate concurrently. Producers could choose whether to join the existing CPR system within a PCS or the alternative 'IPR' PCS sub set. The 'IPR' PCS sub set would operate as follows: • Producers have to sign up to an agreed DfRR (Design for Reuse/Refurb/Recycling) protocol/standard.

Approach	Description
	• Within the IPR product sub set, producers cost allocation by the PCS will be determined on the basis of product type and actual cost of recycling. This will differentiate between products and reward/penalise accordingly. In addition, producers will pay an additional amount to cover the cost of future treatment thus building up an accrual. • In the initial years of the system, the 'IPR' PCS can purchase evidence at a set fee to address any under-collection of WEEE through the IPR system. The 'set fee' is arranged by the authorities.
MARKET SHARE: **4. Mandated Surcharges or Reductions.** *This is based on the current French 'bonus/malus' system.*	• Producers' obligations are calculated based on market share. • A mandatory percentage premium or reduction is applied to PCS compliance fees based on products' put on the market (POM) environmental attributes. • Products with specific characteristics which affect end of life management costs are set a percentage increase or decrease. • PCS are obliged to apply this mandated increase or decrease to producer fees. • See Annex A for further details of French bonus/malus system.
MARKET OR RETURN SHARE: **5. Optional Return Share.** *Market share is the default financing method*	• Producers have an option to report products according to category (1, 2, 3 etc) and pay according to market share. • Alternatively a producer can choose to form their own product category (Category Producer 'X') and report their market share data in this exclusive category. • Those producers choosing to report data in their own separate category pay according to return share.

Approach	Description
but producers can opt for return share[99]	
RETURN SHARE: **6. Brand Sampling or Counting (Categories)** *Example: Maine*	• Producers register and report general categories of products sold, however they do not report detailed sales quantities. • All WEEE is collected through existing DCF network. WEEE is sampled to identify the proportion of each brand within the product category. These proportions are then applied to all WEEE arising within the product category and used to calculate the costs to each brand owner. • Costs are charged as a standard fee per tonne within the product category. Costs per tonne do not vary between brands unless a producer opts to segregate and separately treat their own brands.
RETURN SHARE: **7. Brand Sampling or Counting (Technologies)**	• Producers register and report the general categories and types of products sold, however they do not report detailed sales quantities. • All WEEE is collected through existing DCF network. WEEE is sampled and proportions of WEEE allocated to different brands /producers. • Producers are charged based on narrower product categories or attributes (e.g. separate displays into CRT, LED Hg, LED Hg free).
PAYMENT FOR OWN WEEE: **8. Collaborative IPR**	• This is a back-end IPR option. • Producers are required to establish take back and recycling systems for their own products. • They can collaborate with other producers and organise joint collection and recycling to avoid sorting/sampling by brand.

[99] Source: Developing a Practical Solution to the Implementation of Individual Producer Responsibility for the WEEE Directive in the UK published by ERP UK in December 2007

Approach	Description
Example: Japanese HARL system	• The costs paid should therefore be reflective of their own (or similar) products.
PAYMENT FOR OWN WEEE: **9. 'Pure' IPR**	• This is a back-end IPR option. • Producers are required to establish take back and recycling systems for their own products. • They can collaborate with other producers and organise joint collection and recycling although there has to be brand identification to allow costs to be allocated to individual producers. • The costs paid should therefore be reflective of their own products.
PAYMENT FOR OWN WEEE: **10. Front End Payment funds future WEEE**	• This is a front-end IPR option. Producers pay upfront cost when putting a product on the market. • This money is then used to fund collection + treatment costs of future WEEE arisings. • Compliance fees for new WEEE at the point of POM have to be calculated based on estimated treatment costs in future and estimated product lifetimes. • There will be a 'double payment' period where producers have to fund new WEEE being POM in addition to current WEEE arising. • There are no real life examples of this model to our knowledge.
PAYMENT FOR OWN WEEE: **11. Front End Payment based on set**	• Producers pay an upfront fee when putting a product on the market. • Product sub-categories are defined based on technologies with similar treatment and recycling costs. The upfront fee is standard for all products within a particular sub-category e.g. all LCD displays with mercury-free backlight being POM pay £X, all CRT being POM pay £Y.

Approach	Description
product differentials[100]	• Producer fees are effectively split into 2 parts: (1) based on predicted/estimated future recycling costs i.e. how much will that product cost to treat when it becomes WEEE (adjusted for likely return rates) and (2) collective financing requirements for historic waste and shortfalls. • Money generated by the upfront fee is used to finance WEEE arising within that product sub-category. Additional fees are charged to cover the costs of historic WEEE arising based on market share. • There are mechanisms for handling any over payment (e.g. return to producers or accrued by scheme).

[100] Source: Implementing individual producer responsibility for Waste Electrical and Electronic Equipment through improved cost allocation, K. Mayers, R. Lifset. K. Bodenhoefer, and L. N. Wassenhove. Paper accepted for Journal of Industrial Ecology, 2012.

8.2 Evaluation Criteria

Having identified a range of possible approaches, the IPR WG then developed a series of evaluation criteria. These are shown in Table 3.3. These evaluation criteria were based on the Terms of Reference for the IPR WG which states that the business case for IPR must satisfy four imperatives[101]: commercial, environmental, political and consumer.

Appraisal Criteria: Does this approach…

Commercial Imperatives

1. *Avoid producers accruing funds for future WEEE liabilities?*
2. *Provide a robust mechanism for financing the treatment of orphan or non-branded products equitably?*
3. *Use a cost allocation which is easy to understand, fair and reasonable?*
4. *Offer producers cost certainty (greater predictability of costs enabling more accurate future financial planning)?*

Environmental Imperatives

5. *Reward producers that invest in Product Durability (including ease of repair, upgrade)?*
6. *Reward producers that invest in Design for Recycling (e.g. reduced hazardousness, ease of disassembly/material separation, fewer material types etc)?*
7. *Enhance reuse/refurbishment?*
8. *Support minimum transport movements associated with WEEE collection and management?*

Political Imperatives

9. *Reflect the Government aim of reducing regulatory and administrative burdens on business?*
10. *Meet the requirements of Article 8.2?*
11. *Reflect the Government aim of reducing regulatory and administrative burdens on SMEs?*
12. *Straightforward for authorities to implement and enforce (e.g. Local Authorities, Environment Agency, Central Government)?*

Consumer Imperatives

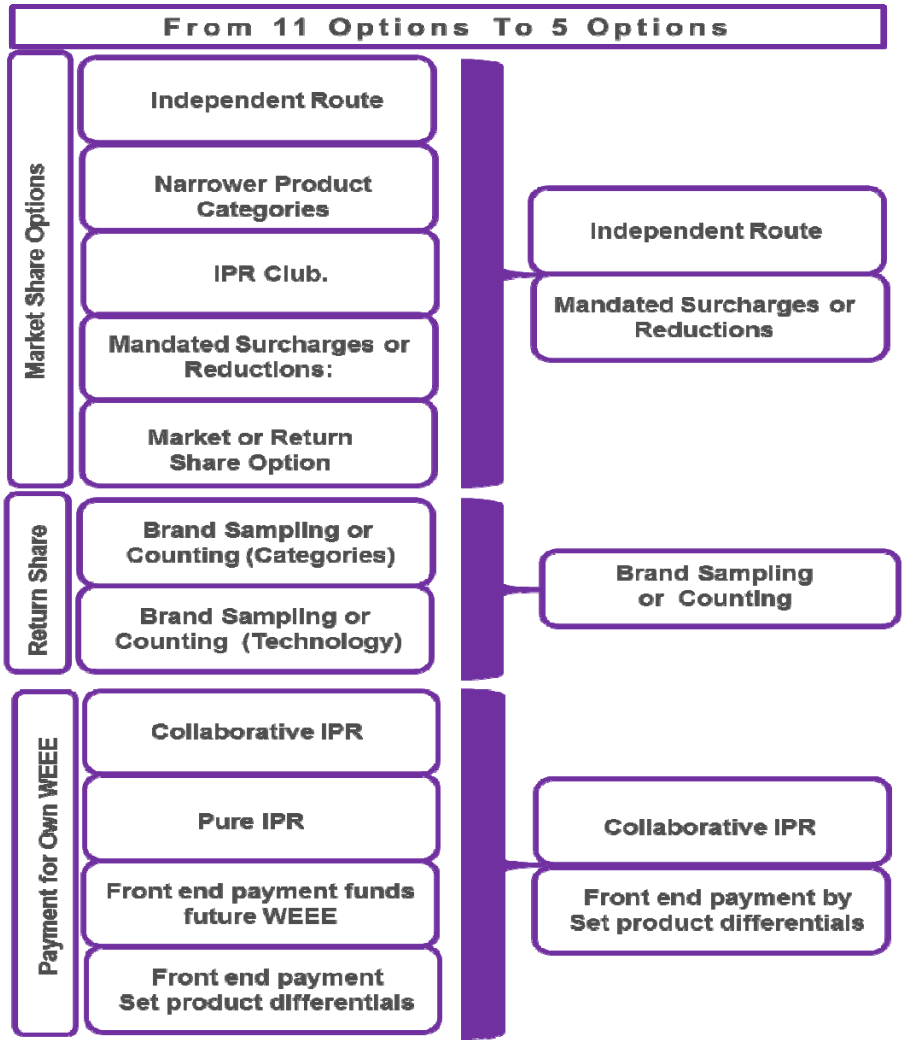
13. *Support a collection infrastructure which is widely accessible and straightforward for consumers to use?*

[101] A full copy of the IPR WG Terms of Reference and the four imperatives is provided in Annex E.

An IPR WG meeting was held, during which members evaluated the 11 options against the criteria. Following this evaluation, the WG decided that 5 options should be presented at the stakeholder event covering the range of different financing mechanisms (market share, return share, payment for own WEEE).

The highest scoring options within each of the 3 approaches were selected as follows:

Figure 8.3: Selection of 5 Options



8.3 Stakeholder Event

A stakeholder event was held on 22nd March 2012. Further details are provided in Annex B. Approximately 45 stakeholders attended primarily PCSs and large producers/producer trade associations. No NGOs were able to attend.

The 5 options were presented along with their key opportunities and challenges.

Break Out Groups

Following the presentations, attendees were divided into 5 break-out groups and asked to comment on (a) proposed criteria for assessing options and (b) five example options.

Stakeholder Feedback on Evaluation Criteria

Participants were asked to comment on the 13 proposed evaluation criteria. The aim was to identify which criteria were most important for the stakeholders present, which criteria were considered redundant and any additions or amendments.

Taking the results from all groups and using the majority views to rank the criteria, the outcome was as follows:

TOP Priority	• "Support a collection infrastructure which is widely accessible and straightforward for consumers to use."
HIGH Priority	• "Use a cost allocation which is easy to understand, fair[102] and reasonable."
MEDIUM Priority	• "Reward producers that invest in Design for Recycling" • "Reflect the Government aim of reducing regulatory and administrative burdens on business" • "Meets requirements of Article 8.2"

An additional issue highlighted as the top priority by several producers and PCSs was 'access to WEEE'. It was felt that this would help to enable producers to predict costs and prevent others from dictating costs. These participants felt strongly that 'physical access to WEEE by producers/their PCSs' should be one of the top key criteria. One participant stated that this would be a "pre-requisite for any IPR system".

Stakeholder Feedback on Example Options

Each group was also asked to comment on the 5 example options.

Two groups reached consensus on a preferred option, one group selected 'Market Share: Independent Route' whilst another selected 'Market Share: Mandated surcharges and reductions'.

The other groups did not state a preference for a specific option although most were not in favour of 'Return share' or 'Payment for Own WEEE: Pure IPR approach'. In

[102] One group suggested adding the term 'equitable'. Another group considered that 'fair and reasonable' were much more important than 'easy to understand'.

general, the stakeholders present felt that these were too burdensome and costly to implement for insufficient reward. 'Payment for Own WEEE: Front end option' was not easy for participants to grasp and stakeholders felt that further explanation would be required in order to give a full considered opinion.

Participants made the following general observations regarding the options:

- There appears to be a trade-off between (a) 'fairness' or rewarding DfRR and (b) simplicity, practicality and low implementation costs. No participants identified a win-win option or silver bullet either from amongst the examples provided or any alternative proposals.
- The suitability of options will differ per product category. An option may be better for one product category but worse for another.
- Flexibility and a hybrid approach may be needed. IPR could be applied to specific product categories. The IPR mode within that category could also be flexible as illustrated by Maine where producers can opt to accept a return share of mixed products or can pay for their own brand to be segregated.
- Changing over to an 'IPR' system could lead to painful 'double costs' for producers in the transition phase – where producers have to pay simultaneously for current WEEE arising and EEE POM.
- Participants were split in their overall opinion on IPR. Some were very positive about the opportunities and competitive advantage it could provide. Others questioned the benefits and thought that incorporating individual financial responsibility via the UK WEEE Regulation was simply too burdensome.

8.4 Evaluation of Options

Following feedback from the stakeholder event, the evaluation criteria were revised:

- Two criteria were removed bringing the total number down to 11:
    - Criterion 1 on accruals was removed to reflect the divergence in stakeholder opinion on the validity of this criterion;
    - Criterion 11 evaluating the impact on SMEs was removed as stakeholders felt that this should be evaluated as part of Criterion 9 relating to impact on all businesses. This decision was supported by early analysis which showed little difference between the options in terms of SME impact compared to the impact on all businesses;
- The criteria were weighted to reflect stakeholder priorities resulting from the break out groups. The top priority criterion (collection) was given a 4 fold multiplier, the high priority criterion (cost allocation easy to understand, fair and reasonable) a 3 fold multiplier and the medium priority criteria a 2 fold multiplier.

Each of the five options was then evaluated by the consultants and given a score from 0 (not met) to 10 (fully met) for each criterion. It was found that some elements were difficult to score due to a number of possible variants within each option and that inevitably scoring is open to a degree of subjectivity.

The results of the evaluation carried out by the consultants are provided in Annex C. They show that according to this evaluation process, the 'Payment for own WEEE' and the 'Return Share Brand Counting or Sampling' outperform the other proposed options.

8.5 Development of a New Option – DfRR Weighting Obligation

Nevertheless, on closer examination of the evaluation process, some members of the IPR WG felt the process had failed to capture adequately whether the options would provide a realistic and practical solution for the UK. Further evaluation was considered necessary.

In particular, some members of the IPR WG were keen to see some characteristics of the present UK system retained whilst recognising the importance of (a) moving towards producers paying costs relating to their own WEEE whilst paying for WEEE arising and avoiding any double-payment period and (b) incorporating effective DfRR incentives via immediate (rather than delayed) payback.

During these deliberations, the IPR WG reflected on other possible 'hybrid' approaches and in parallel to these discussions a new DfRR weighting option was developed by the consultants[103].

This new DfRR weighting option retains some of the features of the UK system whilst applying an increase/decrease to obligated tonnages based on the current actual treatment costs and the characteristics of products being POM.

This option received backing from members of the IPR WG and it was felt this option should be further evaluated. It had some potential benefits but would also require some additional administration.

Further information about this option is now provided in Section 9.5. A detailed examination is provided in Annex D.

[103] The DfRR weighting option builds on concepts such as the French bonus/malus system and the proposal to alter obligated tonnages outlined in *Fair and Efficient Implementation of Product Take-Back Legislation with Collective Producer Responsibility*, L. Gui, A. Atasu, O. Ergun, B. Toktay. Georgia Tech. Working Paper, 2012.

9. Developing an IPR Approach for the UK

This chapter summarises the context within which an IPR solution could be developed in the UK. It then provides an overview of the 3 shortlisted options selected by the IPR WG and provides a comparative assessment of these 3 options.

Having fully considered the evidence and information arising in Sections 1 to 7 along with the process of evaluation undertaken in Section 8, the IPR WG shortlisted three potential options that could be applied in the UK context.

9.1 Key elements of the recast WEEE Directive with respect to IPR

As discussed in the early sections of this report, the recast WEEE Directive introduces no significant changes to the requirements for financing household or non-household WEEE as set out in the original WEEE Directive. Articles 8 and 9 within the original WEEE Directive remain largely intact. However, the recast WEEE Directive does introduce other changes which need to be considered when analysing potential IPR options for the UK. Most notably:

- **Scope:** Under the WEEE recast, after 6 years the scope will cover 6 product categories on an 'open' scope basis: Temperature Exchange Equipment; Screens & Monitors (Displays); Lamps; Other Large; Small ICT; Other Small.

- **Collection Targets:** New collection targets for separately collected WEEE will apply to all WEEE (household and non-household) and will increase as outlined below.

    - After four years, the target will be 45% POM calculated on the basis of the total weight of WEEE separately collected in a given year in the MS, expressed as a percentage of the average weight of EEE placed on the market in the three preceding years in the MS;

    - After seven years, this target will change to either 65% of EEE POM in the 3 preceding years or alternatively 85% of WEEE generated in the MS;Within 3 years, the Commission will examine the possibility for setting individual collection rates for specified product categories;

  - The majority of non-household WEEE is currently managed and treated outside of the current WEEE system. It has yet to be decided how this tonnage will be recorded and reported as part of future collection targets.

  It is not yet known how the targets will be implemented within the revised UK WEEE Regulations and if the collection targets will be assigned directly to PCSs or producers or whether they will be applied to different categories separately.

- **Brand/Producer Identification:** The producer identification requirement previously covered by Article 11(2) has been removed. Whilst the RoHS recast contains some manufacturer and importer identification requirements, these do not have to be indelibly marked on the products in all cases;

- **Differentiated Fees**: The preamble states that collective schemes could provide for differentiated fees based on how easily products and the valuable secondary raw materials they contain could be recycled.

9.2 Key elements of the current UK System

Taking into consideration the current political and economic climate and the recast WEEE Directive, the IPR WG considers that the following fundamental elements of the current UK system are likely to remain in the medium to longer term:

- The current definition of Producer within the UK WEEE Regulations is expected to remain largely unchanged except for the WEEE recast requirement to allow ‘authorised/ legal representatives’ for producers that are already established in another Member State. This therefore means that (a) there may be multiple producers for one brand and (b) there are likely to be between 5000 – 6000 producers registered in the UK;

- The UK will maintain the requirement that all producers must be a member of a PCS, that the present operational plans will continue as before between the authorities and the schemes and that the responsibility for compliance in respect of any changes introduced will be for the PCS to implement with its producer members. Nevertheless individual producers will continue to be able to establish their own scheme to the same approval criteria if they wish;

- The UK will maintain a multiple PCS model providing a competitive market and choice for Producers. There are currently 34 PCSs for household WEEE;

- DCFs will remain largely as at present and may be supplemented by producers’ own take-back activities. Local Authorities or their waste contractors will contract with PCSs for WEEE collection, treatment and evidence. There are currently 1748 DCFs, of which approximately 1200 (68%) are local authority sites and the remainder are private e.g. retailers, other commercial operators, charities etc.;

- The DTS will remain in operation substantially as at present to provide an alternative for retailers in store take-back, although its operation may be enhanced to cover the additional recast requirements (with respect to retailing activities);
- All separately collected household WEEE must be treated at AATFs to the standards set out in the UK WEEE Regulations. Resulting evidence is issued by AATFs to a PCS. There are currently approximately 170 AATFs.

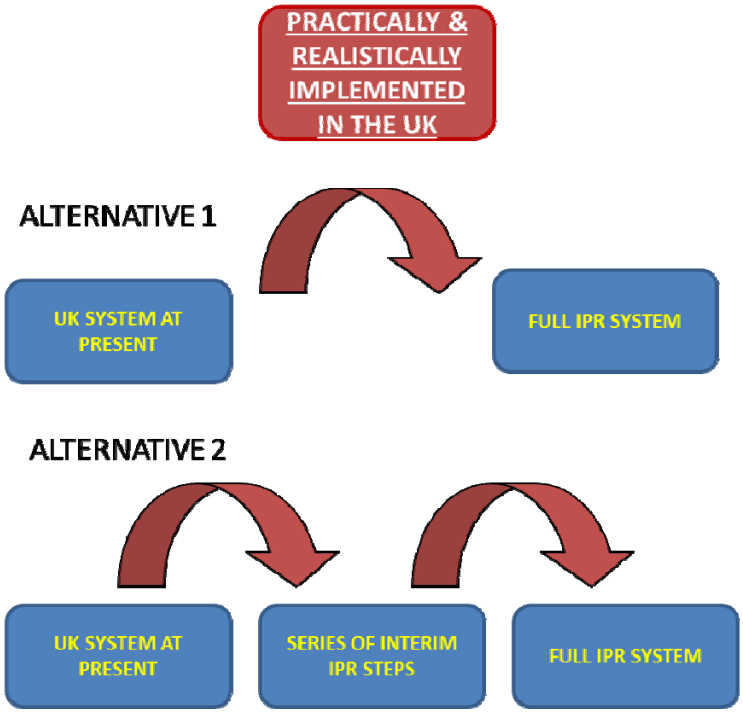
9.3 Key long term goals for the UK WEEE system

In line with the key outcomes that the WEEE Directive and Article 8.2 in particular intends to achieve, the IPR WG considers that an IPR approach within the UK WEEE system should encompass the following long term goals:

- **Producers pay costs relating to their own new household WEEE in accordance with Article 8.2 of the original WEEE Directive.**
- **Provides incentives or payback for DfRR (design for easier repair, upgrading, reuse or recycling).**
- **Producers should have the option to manage their own WEEE compliance directly (with appropriate regulatory safeguards to ensure controls are applied as per PCSs).**

However, the IPR WG also recognises that it may not be possible to make the transition to 'full' IPR in one step. The introduction of IPR needs to be retrofitted onto the existing infrastructure rather than designed onto a blank canvas. Any approach must work within the framework of the recast WEEE Directive and must be both practical and realistic for the UK in line with the IPR WG's terms of reference. Given this context, the IPR WG concluded that a strategy of evolution rather than revolution is most appropriate at this point in time.

Figure 9.1: Strategy of Evolution rather than Revolution



9.4 Shortlisted Options

The IPR WG short-listed 3 options which it is recommended the Government consider further in order to move towards the long term goals whilst being practical and realistic to implement in the UK in the foreseeable future. These are:

- **A DfRR weighting mechanism** which applies an increase/decrease to obligated tonnages based on the current actual treatment costs and the characteristics of products being POM[104].

- **Front end payment for WEEE arising** – based on a version of the model proposed by K. Mayers, R. Lifset, K. Bodenhoefer and L. N. Wassenhove.

- **Return share based on brand sampling** with the option for producers to separate out their own brand WEEE at own cost.

[104] This is a new option which is fully explained in Annex D

An overview of these options is presented below, together with an analysis of their advantages and disadvantages. It is important to highlight that this analysis has been undertaken against the background of the UK context outlined above (see Key elements of the current UK system).

9.5 DfRR Weighting Mechanism

Overview

This approach involves the appropriate authority applying a DfRR weighting mechanism (specified percentage increase/decrease) to producers' obligated tonnages of WEEE arising. The weighting mechanism can be applied irrespective of how a producer's obligated WEEE tonnage is calculated (e.g. through a 45% POM 'Recast' target or through a current 'market share' collection target).

The percentage increase/decrease is based on specified features of products that the producer is *currently* placing on the market, which have a significant impact (positive or negative) on the actual costs of re-use, repair, refurbishment, treatment and recycling. Reducing or increasing a producer's obligated tonnage (and therefore cost) of WEEE arising within a product category is used as proxy for differences in collection and treatment costs of products currently being POM. It therefore reflects in a *relative* rather than absolute form, the costs of collecting and treating products currently being POM whilst still funding WEEE arising.

How would it work in the UK?

All key elements of the current UK system as described above would remain. This option would involve the following steps.

1. BIS would establish the basis for calculating a producer's obligated tonnage of WEEE arising e.g. market share, collection targets[105] or other. Whichever basis is selected would be set out within the UK WEEE Regulations and applied to all producers and schemes on a mandatory basis. The outcome is that each producer is allocated a specific weight of WEEE arising that they must fund within each product category during a compliance period;

2. The authorities (e.g. BIS) would identify key differentials that make one product or class of products cheaper to re-use, repair, refurbish or treat and recycle than another[106]. Once the differential has been identified, it is allocated a percentage increase/decrease based on its impact on the cost of re-use, repair,

[105] For further details of this method please see 'Collection Targets' in Section 6.4

[106] It is possible that a similar process may occur at EU level in future either as part of the Eco-Design Directive or the recast WEEE Directive. The WEEE recast includes a new clause Article 12(6) which states: "The Commission is invited to report, by ..., on the possibility of developing criteria to incorporate the real end-of-life costs into the financing of WEEE by producers, and to submit a legislative proposal to the European Parliament and the Council if appropriate".

refurbishment or treatment and recycling at EOL. There are various approaches which could be used to determine the differentials e.g. establish a Technical Advisory Committee (TAC), joint producer/re-use /recycler forum, WRAP. The differentials would be reviewed on a regular basis (e.g. annually) to take into account developments in product technology, treatment requirements and recycling processes. Examples of possible differentials and options for their identification are discussed in Annex D;

3. Producers would report their products POM (via schemes) within the product categories as at present (or as per the new product categories listed in the Recast in future). In addition, producers would report data within sub-categories based on the differentials set in Step 2. For example, when reporting displays, producers might be required to report the weight of displays POM with mercury backlights and the weight of displays POM with a mercury-free lighting source separately.

4. The relevant authority (e.g. the Environment Agencies) would calculate the obligated volume of WEEE arising. This could be done either for each producer or per PCS depending on how the system was implemented. The obligated volumes would be worked out using the calculation specified in step 1 and then applying the specified percentage increase/reduction established in step 2. There are several variations on how the percentage increase/decrease could be applied to the obligated tonnages. This could involve either a simple multiplier or a reallocation mechanism. Both are illustrated in Annex D.

5. Once steps 1 – 4 are completed, each producer would be notified of their obligated tonnage either directly by the authorities or via its PCS depending on who was charged with undertaking the calculation and application of the weighting mechanism. In either case, the PCSs would be free to set their price per tonne without restrictions but the tonnages of WEEE arising allocated to each producer should be directly transferred in order to make the weighting mechanism effective.

6. Each producer would be free to either pay for compliance via the PCS costs per tonne and/or to meet all or some of their obligated tonnage via their own take-back channels and have these discounted from their overall responsibility.

9.6 Front end payment funds WEEE arising

Overview

This approach is based on a model proposed by K. Mayers, R. Lifset, K. Bodenhoefer and L. N. Wassenhove[107]. In this option, producers pay according to the *current* costs of collecting, treating, and recycling the *sub-category* of EEE being put on the market. For example, rather than all display producers paying the same £/tonne or £/unit, those placing LCD Hg free displays on the market would pay less than those placing LCD with Hg backlights on the market based on the actual current recycling costs.

This approach would result in a more accurate distribution of costs to producers[108], however, as the amount and composition of WEEE arising will not be the same as that sold (e.g. CRTs are predominant in waste displays collected, but LCDs TVs comprise most sales) a balancing mechanism is introduced. WEEE schemes either refund producers their average financial surplus per tonne for each collected WEEE collection category (e.g. displays) or recharge their average financial shortfall. Additional details of how the system would work in the UK are provided below.

How would it work in the UK?

This option would involve the following steps.

1. Sub-categories within each existing WEEE collection category would need to be determined centrally by the Government or Environment Agencies. These sub-categories would be determined according to actual treatment / recycling requirements or costs for the sub-category. It is envisaged that the number of sub-categories would be limited to around 10-15 and would result in a similar level of reporting complexity as experienced by producers at present. Example sub-categories could be:

    - Within the displays collection category, the subcategories could be CRT TVs, LCD TVs (with mercury backlights), LCD TVs (mercury free),

    - Within the cooling collection category, the subcategories could be based on type of refrigerant.

    - Within the mixed WEEE collection category, the subcategories could be laptops (with mercury backlights), laptops (mercury free), servers, mobile phones, Other

[107] See *Implementing individual producer responsibility for Waste Electrical and Electronic Equipment through improved cost allocation,* Paper accepted for Journal of Industrial Ecology, 2012. Note the shortlisted option is version 1 of the model and does not involve future estimated cost.
[108] According to K Mayers.

- Within the lamps collection category, the subcategories could be compact fluorescent light-bulbs and fluorescent tube lights.

The LDA collection category would probably not have any sub-categories.

The definition of treatment sub-categories could evolve with time to reflect changes in technology.

2. The estimated WEEE return rate by sub-categories would also need to be determined centrally based on the lifetime sales vs waste. This could be adjusted regularly based on experienced return rates for any sub-category e.g. it can be expected that collection /sales volumes for LCDs will eventually match those over the lifetime of CRTs.

3. Each scheme would then determine fees based on actual recycling costs, and then compete for producer members on this basis. AATFs already charge different fees for differing types of WEEE and have detailed knowledge of material values and treatment costs for each. The definition of sub-categories does not necessarily require their separate treatment (i.e. collection categories would be retained), but does encourage better allocation of actual treatment costs and recycling value to each sub-category.

4. Producers would report their products POM within the sub-categories and pay fees according to the *current* costs of collecting, treating, and recycling these *sub-categories.* A further payment by/refund to individual producers would be required to balance the total incoming producer fees with the total outgoing treatment and recycling costs paid by the schemes.

   The balancing part of the fee calculation would be based on overall scheme costs for a collected category e.g. displays, cooling etc. This balancing calculation could be estimated monthly and corrected / adjusted to actual scheme collected treated results during the normal end-of-year settlement period.

9.7 Return Share based on Brand Sampling

Overview

Producers would be allocated responsibility for a proportion of WEEE arising within each product category based on (a) a brand sampling exercise to identify the percentage of their own brand(s) within WEEE arising and (b) a percentage of unregistered WEEE pro rata based on return share. Producers would have the option to separate out their own brand WEEE at point of collection, consolidation or treatment at their own cost. Alternatively producers could pay the standard fees per tonne as charged by their PCS.

How would it work in the UK?

All key elements of the current UK system as described above would remain.

1. Producers would have to register and report data according to brand names they were putting on the UK market.

2. A brand sampling exercise would be undertaken by, or on behalf of, the authorities to identify the proportion of each brand within each product category of WEEE arising. This would need to be of adequate scope and frequency to account for geographical and seasonal differences in WEEE arising at multiple DCFs or AATFs across all product categories in order to be suitably representative and statistically reliable. It may be funded by central government or by producers depending on how it is implemented. The weight of each brand within the sample would determine the percentage allocated per brand.

   Eg, if within 100 tonnes of waste there were 20 tonnes of brand yellow, 50 tonnes of brand blue, 20 tonnes of orphan products and 10 tonnes of product associated with free riders[109] yellow would be allocated 20%, blue 50%, orphan products 20% and free riders 10%. In practice, a more sophisticated sampling protocol would be developed involving representative samples being taken for each product category from different localities and at different times of year to ensure that any significant geographical and seasonal differences were captured.

3. The percentages from step 2 would then be applied to the total weight of WEEE arising within a compliance period to calculate a producer's obligated tonnage. Each producer would pay for their 'own' brand proportion plus a proportion of orphan products and free riders[110]. If financial guarantees were required then over time there would be no orphan products. If financial guarantees were not required then the costs for orphan products would be divided between producers remaining on the market in proportion to their own brand percentage[111]. As would be expected, experience has shown (e.g. ICT Milieu, Maine) that return share systems operate best where the proportion of orphan and free rider products is minimal[112]. This depends on enforcement (to minimise free riders)

[109] Unregistered brands would be due to either free riders (i.e. brands belonging to a single producer who had not registered) or orphans (i.e. brands belonging to producers who had now left the market).
[110] For example, if brand yellow was only being POM by a single producer, this producer's obligated tonnage would be calculated as 20% for own brand + 6% for orphans/free riders = 26% of WEEE arising in that product category during the compliance period. The orphans/free riders proportion is calculated by applying the producer's brand share percentage to the percentage of orphans/free riders from the sampling exercise therefore 20% of 30% = 6%.
[111] Under the majority of return share systems which exist at present, or have in the past, e.g. Maine, ICT Milieu in the NL, the costs of orphan products were shared by the producers still existing on the market and individual financial guarantees were not required.
[112] See pages 30 – 36 in IPR: A Review of Practical Approaches to Implementing Individual Producer Responsibility for the WEEE Directive, INSEAD IPR Network, INSEAD Working Paper, 2010.

and either a product category with a high proportion of relatively stable brands or the presence of financial guarantees (to minimise orphan products).

4. Where a single brand is being POM by multiple producers (i.e. due to definition of Producer within the current UK Regulations and recast WEEE Directive), the percentage allocated to that brand must be divided up between the responsible producers of that brand. Arguably the fairest and most accurate way of doing this would be based on market share using historical sales figures (if available) but otherwise market share based on current sales figures could be used. This would place an additional reporting requirement on producers (especially importers) who will need to report by brand. In practice, the 'primary' brand owners may opt to assume responsibility for all their branded products (even if imported via another party), therefore increasing the burden on brand owners.

5. Once the above steps are completed, each producer would be notified of their obligated share either directly by the authorities or via its PCS, depending on who was charged with undertaking the calculation and application of the return share mechanism. In either case, the PCSs would be free to set their price per tonne without restrictions but the tonnages allocated to each producer should be passed down to each producer directly according to the return share calculation in order to make the mechanism effective.

6. Each producer would be free to either pay for compliance via the PCS costs per tonne and/or to meet all or some of their obligated tonnage via their own take-back channels and have these discounted from their overall responsibility. This would need to be subject to the same requirements for reporting and controls as apply to PCSs. A producer would need to provide sufficient advance notification to its PCS of its plans to undertake individual take-back so that the PCS can make effective compliance plans.

7. In addition, each producer would have the option of paying for their own brand WEEE to be separated at DCFs or AATFs and to finance its re-use, refurbishment or recycling. Given the number of PCSs in the UK, this option is easiest to implement for the WEEE collected by the member's own PCS. The PCS would set a charge which would cover the costs of collection, transport (if applicable) and separation and then the producer would organise and pay the costs of re-use, refurbishment or recycling for their own brand products from the point of separation onwards.

8. Implementing brand separation of WEEE in the control of other PCSs would require commercial negotiation and reciprocal agreements between the PCSs to be put in place. Alternatively a system may allow producers to reach agreement with other PCSs to pay for access to their own brand WEEE.

Table 9.1 Analysis of Shortlisted Options[113]

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
Commercial imperatives			
What are the likely time and resource implications on producers implementing the approach?[114] Note any particular impacts on SMEs.	• Additional data burden on producers to report their products POM in sub-categories according to the specified product differentials. The impact of this data burden would depend on (a) the number of differentials set (b) whether the differentials related to features already captured within producers' existing product data	• Producers may need to pay for the brand sampling to be undertaken and maintained. It is difficult to predict the costs of sampling exercises. The costs quoted for existing return share systems are modest (28k Euro/a in one US state and similar in some smaller EU markets) however their geographical scale, sampling frequency and	• Additional data burden on producers to report their POM data in treatment sub-categories. The impact of this data requirement would depend on whether the sub-categories related to features already captured within producers' existing product data systems. This may still only be 10-15 categories as

[113] The bases of the format analysis was agreed by a majority of the IPR WG with only one member dissenting.

[114] One member felt that the full costs of each of these options needs to be understood, for example the potential costs of any new administration to analyse and determine the product design attributes/materials and the relative price differentials, the costs if producers are required to assess their products against new criteria, and the costs of sampling methodologies to be undertaken - so that the potential costs arising from each of these options, for producers, can be fully assessed.

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
	systems. This may still only be 10-15 categories as today, but initially a change in reporting would be required. A default reporting category could be set if this is considered too burdensome for all, or a particular, differential. However, this would reduce the impact of the DfRR payback. 9. This option will require a process/organisation to analyse and determine the product attributes to be differentiated. Producers may wish to be involved in this. The level of impact will be	product scope is different to that envisaged in the UK. • Additional data burden as all producers must report POM data by brand. • EEE must have indelible brand marking[115]. • Producers opting for separation of own brand would need to negotiate terms with PCS(s) and potentially DCFs and AATFs, to fund costs of separation and organise re-use, refurbishment or recycling. • Producers that experience a sharp reduction in product	today. • Schemes may hold limited surpluses for a short period during a compliance period, although this is equivalent to current practice. • This particular front end payment model has no practical experience and so it is difficult to assess implementation costs.

[115] The name of the importer does *not* have to be on the EEE. However, the EEE must clearly bear the brand declared by the importer at point of registration in order for the brand to be identified during the sampling exercise.

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
	influenced by the breadth of coverage of the differentials. • The model has no practical experience and so it is difficult to assess implementation costs.	sales will still face high WEEE costs. Conversely new entrants to the market will face low WEEE costs.	
What are the likely Producer impacts in terms of Financial Guarantees (FG)?	• It is possible to implement this option either with, or without, individual producer FGs. If without, a collective FG would need to be in place from all remaining Producers in the market.	• A return share system based on brand sampling could operate with FG in order to reduce the proportion of orphan WEEE. • A system without FG would require orphan products to be funded by producers in some other way (e.g. pro rata). • Return share is less effective for product categories with a high level of orphan WEEE. The financial viability of a return	• The balancing payment would provide a collective guarantee. Essentially the same as under the current UK WEEE system. • An additional FG system could be implemented if desirable.

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
		share system without FGs may be threatened if several major players within a product category leave the market.	
What are the likely Producer impacts in terms of Company accruals? Note the analysis responses are based on the IPR WG's opinion and do not represent legal or professional accountancy advice.	• Accruals would primarily depend on what approach is used to calculate the obligated tonnage (e.g. market share, collection target, other). This determines when the accrual would need to be made and for how long. The weighing mechanism would subsequently affect the level of any accrual.	• Companies would be required to make accruals from the point of putting a product on the market as this is when the liability is incurred. • The accrual would need to be made for the lifetime of the product taking into consideration the following variables: future treatment costs, estimated product lifetime, likely return rate, proportion of separated own brand WEEE in future, proportion of free riders, volume of orphans in future	• Short terms accruals may be needed for the immediate compliance period (e.g. 12 months). As under the current UK WEEE system.

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
		(depending on FG requirements).	
What are the likely time and resource implications on Producer Compliance Schemes implementing the approach?	• This option will require a process/organisation to analyse and determine the product attributes to be differentiated. PCSs may wish to be involved in this. The level of impact will be influenced by the breadth of coverage of the differentials. • Possibly some additional administration to allocate weighted obligation to producer members depending on whether this is done by the PCS or by the Environment Agencies.	• Negotiate and organise process to enable own brand separation at either DCF or AATF. • Negotiate terms and costs with producers opting for own brand separation. • Potential role to check brand marking is being followed by members?	• Essentially Compliance Scheme procedures would remain the same as today, with some adjustments to their internal accounting only. • Compliance Schemes would be encouraged to differentiate fees to producers based on actual recycling costs, meaning they may seek greater technical expertise than today.

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
What are the likely implications for Local Authorities?	• No implications.	• If own brand separation occurs after point of collection – no impact on LAs. • If own brand separation occurs at point of collection e.g. DCF – the LA or its contractors would need to negotiate and organise process with PCS. Separation unlikely to be feasible at small scale DCFs due to space constraints.	• No implications.
What are the likely time and resource implications on AATF's implementing the approach?	• No implications.	• Selected AATFs will need to participate in the brand sample exercises. • Optional own brand separation is likely to be most feasible at an AATF. All AATFs would need to negotiate costs with PCSs and establish a process to enable own brand separation	• AATFs may be asked by Compliance Schemes to breakdown their costs and materials data in greater detail to assist with calculating sub-category fees.

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
		for those producers selecting this route. Note the costs of separation would be funded by the producer.	
Would it be compatible with producers doing their own take back within PCS framework?	• Yes	• Yes	• Yes
Environmental imperatives			
To what extent would it provide incentives or payback to Producers for DfRR?	• Once the differentials have been agreed, the producer gets an immediate gain/penalty based on the DfRR features of the product being POM. • It is possible for the differentials to take into account any trade-offs between environmental	• Producers investing in product durability would be likely to have reduced WEEE costs although this would depend on weight, costs of repair/refurbishment etc. • Producers complying only via PCS tonnages would receive	• Fees would be differentiated to producers based upon the actual recycling and treatment costs of their products, in accordance with the principle of 'IPR'. The producer gets an immediate gain/penalty based on the DfRR features of the

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
	impacts. • It is equally applicable to producers of all sizes. Any payback from DfRR changes covered by the specified differentials is available to both SMEs and larger producers. • Payback is limited to those DfRR factors which are easily and clearly measurable at the time of putting a product on the market i.e. 'yes' the EEE meets the differential or 'no' it does not. • In this system, there is no direct relationship between the producer and recycler. Producers will not get their own products back to close the loop without some additional	few DfRR incentives or payback (assuming PCSs continued to charge a flat fee per tonne per product category). • The primary mechanism for producers to access DfRR payback would be via the separation of their own brand WEEE. They would pay the additional costs of separation but could benefit directly from DfRR payback for the specific volume of separated own brand WEEE. The level of payback would therefore be dependent on the ability of producers to access their own brand WEEE within a multiple PCS system. • The viability of paying for separation (and hence access	product being POM. • In this system, there is no direct relationship between the producer and recycler. Producers will not get their own products back to close the loop without some additional mechanism. • The response to producers' DFRR changes will not necessarily have immediate effect due to required changes to the sub-categories.

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
	mechanism. 10. The response to DFRR changes could be slow depending on the process for agreeing/revising differentials.	to DfRR rewards) may not be feasible for SMEs due to lack of economies of scale. • Producers opting for separation would access the actual payback when the product reached EoL (i.e. delayed payback). Producers may be able to access some form of immediate incentive via reduced accruals (and FGs if system requires). This would depend on the auditors' judgement. • For producers opting for brand segregation, end of life costs reflect the actual design improvements.	
Ease of applicability to all product	• Any product category for which there is a key differential which	• Products requiring separate manual handling (eg	• Any product category for which there is a key differential which

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
categories. Would the option have full or restricted scope? Are there any product categories to which it would be easier or more difficult to apply? Note further research is required on this issue to provide a comprehensive analysis.	makes one product cheaper to re-use, repair, refurbish or treat and recycle than another and is easily measurable.	disassembly) are good candidates e.g. screens and cooling as they are separately managed so easier to identify[116]. • Some ICT producers believe it is well suited to their products. • Cooling and 'Other large' equipment due to ability to mark and relatively small number of stable brands on the UK market. • Displays due to the manual handling requirements and size, although apparent frequency of brand 'changes' may be an issue.	makes one product cheaper to treat and recycle than another and is easily measurable.

[116] Source: Informed by Chris van Rossem interview for IPR WG.

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
		• May be challenging to apply to product categories with a large number of small products that are not easily identified or distinguished.	
What are the likely impacts on collection/return rates?	• No impacts. The current collection infrastructure will remain.	• No impacts. The current collection infrastructure will remain.	• No impacts. The current collection infrastructure will remain.
Would it affect the level of transport movements required for WEEE collection & management?	• No impacts as the current collection, transportation and treatment infrastructure will remain.	• Increased transportation impacts would be likely to result from those producers wishing to separate their own brand WEEE from DCFs and AATFs.	• No, the method operates independently of collection.
Political imperatives			
To what extent would it meet the Article 8.2	Partially: • This will depend partly on what	Partially: • All producers would be	• Arguably this option fully meets the requirements of Article 8.2

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
requirement that: Each producer shall be responsible for financing [at least the collection, treatment, recovery and environmentally sound disposal of WEEE from private households deposited at collection facilities] *relating to the waste from his own products*.	basis is selected by BIS for calculating the obligated tonnage (e.g. market share, collection target, other). • It will also depend on the scope of DfRR differentials applied. If they are limited in scope this approach will not move as far towards Article 8.2 compared to if a comprehensive range of differentials is applied. • The DfRR weighting reflects in a relative rather than absolute form, the costs of collecting and treating products currently being POM. It is a matter of interpretation whether this meets the Article 8.2 wording 'relating to'.	responsible for a representative proportion of their own brand WEEE. • For producers complying via the PCS tonnages the costs for that WEEE would not be reflective of the actual costs of treating their own WEEE (assuming PCSs retained universal £/tonne/product category). • For producers separating out their own brand WEEE the costs would fully meet Article 8.2 for the volume of own brand WEEE that could be accessed. • The costs associated with imported products (producers who are importers) may in practice fall to brand owners. However, it is not clear how	as producers are paying the cost of treating their own product types according to defined sub-categories. • As the sub-categories are defined according to treatment/recycling costs of different product types, the costs a producer pays should be reflective of his own products.

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
		significant this displacement could be.	
To what extent would it meet the Government aim of reducing regulatory and administrative burdens on business?	• Additional reporting requirements would be faced by all producers. The impact of this data burden would depend on (a) the number of differentials set (b) whether the differentials related to features already captured within producers' existing product data systems. A default reporting category could be set if this is considered too burdensome for all, or a particular, differential. However, this would reduce the impact of the DfRR payback. 11. This option will require a process to analyse and determine the product attributes	• The burdens associated with separation would be on a purely optional basis. • There would be additional issues associated with agreements regarding the substitution of 'own' brand with 'mixed' brand WEEE at AATFs.	• Additional data burden on producers to report their POM data in treatment sub-categories. The impact of this data requirement would depend on whether the differentials related to features already captured within producers' existing product data systems. This may still only be 10-15 categories as today.

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
	to be differentiated in which producers may wish to be involved. The level of impact will be influenced by the breadth of coverage of the differentials.		
Would it be easy for authorities (e.g. BIS, Environment Agencies) to implement in terms of time and resource requirements? Both initially and on an ongoing basis.	• The main impact would be the time and resources required to identify relevant product differentials, set clear criteria and identify the appropriate weighting. These will need reviewing on a regular basis e.g. annually. The level of resources required depends heavily on the process selected (see Annex D) and also whether they are developed on a UK or EU level. • The central authority responsible for calculating obligated tonnages may need to establish	The main impacts on authorities would be: • Identify which product categories would be suited to a return share option and any financial viability concerns based on market changes. • Oversee representative sampling exercise covering selected/all product categories. • Apply return share calculations to WEEE arising and apportion volumes of orphan/free riders as required. • Calculate and apportion	• There would be some work for agencies to introduce new WEEE sub-categories and determine acceptable return rates for use by schemes to calculate fees, and for transparency to producers on the return rates that should apply to their products.

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
	an automated system to carry out the calculations and inform each producer and/or their PCS. This would involve an initial input of time and resources.	responsibility between producers of the same brand if brand owner does not assume responsibility.	
Can it be effectively enforced by the authorities? What are the likely time and resource implications?	• Ensuring that producers were correctly reporting products against the specified differentials is the key additional requirement in terms of enforcement. This would primarily be based on self-declaration by producers. • There is a danger that without effective enforcement producers could manipulate their declarations to reduce their costs. This is the same as the current UK situation.	• The effective operation of a return share system benefits greatly if free riders are minimised as it is based on apportioning costs by brand. The authorities would therefore need effective enforcement to ensure that the majority of producers and brands within each product category were registered. • An unfair burden would fall on a single producer if other importers of the same brand failed to	• Ensuring that producers were correctly reporting products against the sub-categories is the key additional requirement in terms of enforcement. This would primarily be based on self-declaration by producers. • There is a danger that without effective enforcement producers could manipulate their declarations to reduce their costs. This is the same as the current UK situation.

Issue	DfRR Weighting Mechanism	Return Share (Brand Sampling + Optional Separation)	Front End Payment funds WEEE Arising (K. Mayers et al)
		register.	
What additional impact would it have on the UK's obligation to meet the collection target within the WEEE recast?[117]	• No impacts on collection/return rates are envisaged. • The POM% collection target could be applied at individual producer level.	• No impacts on collection/return rates are envisaged. • It would be difficult to apply the POM% collection target down to individual producer level within this system.	• No impacts on collection/return rates are envisaged. • The POM% collection target could be applied at individual producer level.
Consumer imperatives			
What are the likely impacts on the present collection infrastructure and accessibility?	• No impacts as the current collection infrastructure will remain unchanged.	• No or few impacts as the current collection infrastructure will remain.Brand separation by the consumer at the DCF is an option but is unlikely to be the selected method for separating own brand WEEE.	• No impacts as the current collection infrastructure will remain unchanged.

[117] One member felt that this evaluation has not analysed the applicability of these options to a WEEE generated collection target.

9.8 Evaluation Findings

From the IPR WG evaluation of the options above, it is clear that all 3 have advantages and disadvantages. The IPR WG did not find the 'silver bullet' - an option which all members believe clearly meets Article 8.2 and comprehensively rewards producers for DfRR whilst being practical and realistic to implement in the current UK context.

However, it was felt that all 3 options listed would move the UK WEEE system closer to meeting Article 8.2 and, from an IPR perspective, would be an improvement on the current market share system.

In order to identify the final recommendations of the WG, a vote was taken which resulted in:

- An overall majority view that all 3 options should be presented to stakeholders by BIS as possible approaches for their consideration and feedback;
- A slim majority supporting the DfRR weighting mechanism as the primary recommendation;
- No votes for Return Share based on brand sampling or Front End payment for WEEE arising (specific model as outlined above) to be the primary recommendation[118];
- A single view that PCSs should be free to select and implement multiple options within a framework of key principles outlined in the UK WEEE Regulations.

In addition, it was agreed that in order to (i) facilitate the move towards IPR (ii) address specific requests from producers and (iii) meet the WEEE Directive's requirement that producers are allowed to set up and operate individual and/or collective take-back systems for WEEE from private households[119], a primary recommendation is therefore made to fully enable and facilitate producers wishing to undertake their own individual take-back activities within the framework of mandatory PCS membership.

[118] One IPR WG member did vote that a front end payment model would be their preferred option in a particular sector i.e. lighting but noted that it would not necessarily be a preferred option in all sectors.
[119] Article 5(2)d in the recast WEEE Directive.

10 Recommendations

This section presents the IPR Working Group's recommendations for how IPR could be practically and realistically implemented in the UK. This meets the principal aim of the Working Group as set out in the Terms of Reference.

This section presents the IPR Working Group's final recommendations for the Department of Business Innovation & Skills (BIS). These constitute:

- Primary recommendations for how the UK WEEE system could move towards Article 8.2 and incorporate IPR elements; and
- Secondary recommendations focused on supporting actions which are needed to facilitate the primary recommendations.

10.1 Key Principles

Bearing in mind the current political and economic climate and the need to implement an approach which is both practical and realistic, the IPR WG recommends that the following key principles are applied. The UK WEEE system should:

- **Move towards producers paying costs relating to their own WEEE** in accordance with Article 8.2 of the original WEEE Directive and in doing so also incorporate effective DfRR incentives;
- **Be based on a strategy of evolution not revolution.** The UK has an established WEEE system and infrastructure which should be modified, through a series of interim evolutionary steps, to progress towards the policy aims of IPR as set out in Article 8.2;
- **Avoid any double-payment period.** Given the current economic pressures on producers, it is advisable to avoid any mandatory double-payment period (i.e. where producers pay for WEEE arising at the same time as paying for EEE being POM).

10.2 Primary Recommendations

The IPR WG makes 2 primary recommendations as follows:

Recommendation 1[120]:

Three options for moving towards Article 8.2 should be presented by BIS within the forthcoming stakeholder consultation on possible changes to the UK WEEE Regulations. This will enable the validity of the analysis undertaken in Section 9 to be tested and for the commercial and environmental merits of each to be properly determined.

These 3 options[121] are:

- DfRR Weighting Mechanism
- Return Share based on brand sampling
- Front End payment for WEEE arising.

By a slim majority, the IPR WG concluded that the DfRR Weighting Mechanism was the preferred option for the UK at this time but there were dissenting views. The IPR WG recommend by overall consensus that all 3 options and their commercial and environmental merits should be presented for consultation.

Recommendation 2:

The UK WEEE system should fully enable and encourage producers wishing to undertake their own direct take-back activities for household WEEE whilst putting in place safeguards to ensure that the proper collection, treatment and recycling still occurs.

This is in order to (i) facilitate the move towards IPR (ii) address specific demands from producers and (iii) meet the WEEE Directive's requirement that producers are allowed to set up and operate individual and/or collective take-back systems for WEEE from private households[122].

In the current UK WEEE Regulations, Producers have this facility by being able to set up their own PCS. It is recommended that this be extended by requiring PCS's to offer Producers the option to undertake individual take-back within PCS membership, provided that the Producer can demonstrate that they will at least meet all the requirements that PCS's are obliged to meet and that there will be no regulatory or financial risk falling on the PCS and/or the other members of the PCS.

[120] Recommendation 1 sets out the first step in a series of interim steps towards a full IPR system. An approach agreed by the IPR WG and as set out in Section 9.3
[121] See Section 9.4
[122] Article 5(2)d in the recast WEEE Directive.

Producers wishing to meet all or the majority of their obligations via own take-back within a PCS should not face prohibitive administration costs, unnecessary PCS costs linked to collective collection or unreasonable barriers to PCS membership.

10.3 Secondary Recommendations

These secondary recommendations are intended to inform both the Government and relevant authorities on other related matters that have come to the IPR WG's attention during the preparation of this report.

In the main, these are of a practical nature and due consideration should be given to them because they either a) highlight potential areas of risk and/or opaqueness in the present system or b) they have an impact on the effective implementation of the Primary Recommendations as set out in the section above.

Guiding principle of evolution not revolution

The purpose of this report is to set the UK on a course that will enable it, through a series of interim evolutionary steps, to progress towards the policy aims of IPR as set out in Article 8.2. In parallel to this, the sector as a whole will require time to consider and reflect upon the recommendations and/or implications arising from this report[123].

Recommendation 3:

The Government, through BIS should take this window of opportunity to engage with the industry and the wider sector on the recommendations arising from this report. This will ensure that a phased implementation plan can be formulated that converges, in terms of any medium term regulatory changes required, with the transposition of the recast WEEE Directive but also allows time for the development and consideration of further longer term improvements and enhancements which might be considered in future.

The Government, through BIS, should continue to have oversight of the UK's IPR policy and its effective implementation. Guidance should then be provided to the Environment Agencies by BIS to enable them to advise the PCSs of the changes required so that these changes and/or requirements can be accommodated within the present PCS operational plans. The contractual relationship between the PCS and their producer members remains unchanged. Thereafter, the Environment Agencies will still remain responsible for monitoring and effective enforcement.

Recommendation 4:

The Government, through BIS should ensure that regular reviews are undertaken on the effective implementation of the UK's policy on IPR to ensure that the intended aims of the WEEE Directive are being met. To this extent, minimum review intervals of 3 years appear appropriate in the circumstances. This review process should take the opportunity to identify further evolution towards a full IPR approach taking into consideration

[123] It is assumed that new regulations in respect of the recast WEEE Directive will come into force in 2014 following a consultation process.

developments in collection, treatment and recycling infrastructure, financial guarantee options, product identification (e.g. RFID tagging), policy development (e.g. Eco-Design Directive) and the nature of EEE being placed on the market and WEEE arising.

Recommendation 5[124]:

Depending on the IPR option ultimately decided upon by Government from the three set out in this report, the Government, through BIS, will need to consider what additional measures will be required in order to implement the option.

By way of an example, BIS might have to establish an arm's length advisory committee comprised of representatives from the producer community (all relevant categories and PCSs), collection and treatment industry, academia, enforcement authorities and NGOs, as applicable. A committee would need clear terms of reference to help advise the Government on an impartial basis on various aspects of implementation such as:

- In relation to the DfRR Weighting Option: the possible product differentials and the relevant percentages to be adopted as well as more general issues regarding the future policy direction of IPR.

- In relation to the Front End Payment Option: the possible WEEE sub-categories and likely return rates for these sub-categories of WEEE as well as more general issues regarding the future policy direction of IPR.

- In relation to Return Share option: the sampling methodology to be undertaken and related guidance to help inform the actual sampling process as well as potential changes to the sampling methodology.

Categorisation of UEEE and WEEE

Whilst the concept of WEEE is fully understood, there appears to be a lack of clarity as to what constitutes UEEE and when. This lack of clarity could lead to an unnecessary burden on producers who are looking to introduce and/or facilitate their own take back arrangements, especially if the items of equipment that are taken back are regulated as waste when perhaps they should not be.

Recommendation 6:

The Government should review, as necessary, the present guidance and/or decision tree regarding the identification and categorisation of UEEE as opposed to WEEE in order to ensure that implications for all take-back systems are clear and remove any unnecessary regulatory burdens from the producers.

[124] The IPR Working Group recognises the Government's light touch regulatory agenda. Where specific expertise is required and this expertise is not within the relevant Government Departments, then there is a policy precedent in place for these types of specialist committees. Recommendation 5 is set within this context.

IAS 37

In Section 6.9 of this report, the role and importance of this accounting standard can be seen. The requirements of IAS 37 can give rise to potential challenges for producers who are looking to implement an IPR solution.

Recommendation 7:

The Government should engage, through BIS with the relevant professional accountancy bodies (such as the Accounting Regulatory Committee 'ARC')[125] to make them aware of the potential challenges arising from IAS 37 and to see what amendments can be realistically accommodated without, at the same time, giving rise to any presentation risk in so far as the financial statements are concerned.

Transposition Guidance: How to implement European Directives effectively

The present collection targets under the original WEEE Directive and the 45% interim target mandated under the recast WEEE Directive are binding on the UK as a whole.

On 15 December 2010, the Government announced Guiding Principles for EU legislation. This Guidance has been drafted for use by policy makers and lawyers across Government. It explains what departments need to do to implement EU legislation to meet the requirements in this Guiding Principles1. It can also be referred to by, but is not binding on, officials in the devolved administrations.

There have been considerable administrative and financial benefits for producers in having a common implementation model across the UK so that, for example, registration in one part of the UK is registration for the whole of the UK. Common guidance, interpretations, data forms and IT interfaces also help to create a level playing field, minimise duplication and reduce the risk of misunderstandings.

Recommendation 8:

In order to ensure that the UK can meet its obligations under the WEEE directive and that producers, PCSs and AATFs continue to benefit from a common implementation model, the Coalition Government is urged to work closely with the Devolved Administrations. Where there is a desire to have a bespoke requirement in one nation in the UK, the Governments should have regard to relative cost and benefit of the proposal and, if it goes ahead, ensure that it can be accommodated within the structure of the overall UK approach.

Provision of Financial Guarantees

There is a requirement under Article 8.2 of the WEEE Directive that each producer provides a guarantee when placing new household EEE on the market showing that the EOL costs will be financed. The Directive provides examples of possible financial guarantees e.g. participation by a producer in appropriate schemes, a recycling insurance

[125] http://ec.europa.eu/internal_market/accounting/committees/index_en.htm

or a blocked bank account. Whilst the outcome required in the Directive is clear on this matter, a number of issues arise in the case of some collective guarantees.

Whilst there is a section in the PCS Operational Plan where schemes have to report on their Financial Resources as a condition of approval, what constitutes Financial Resources and what actual tests should be undertaken to determine the adequacy of these Financial Resources is not properly set out. In so far as the producer members are concerned, the schemes can already undertake external solvency checks in the normal course of business and perhaps this can be included in the operational plans as best practise.

Both these aspects should be subject to review at regular intervals to ensure that any potential financial risk[126] for both the sector and scheme members is adequately covered.

Recommendation 9:

The Government should take this opportunity to review this risk and then through BIS, determine any enhancements to the Financial Resources checks[127] to be put in place and their frequency for both the PCS schemes and for their producer members. Under guidance from BIS, the requirements for any financial resources checks can be provided for within the present operational plans as agreed between the Environment Agencies and the registered PCS schemes.

In the event that there is any doubt raised about the solvency of either a PCS or a producer member, appropriate action should be taken by the authorities to address this. This action could include by way of example, additional capital being injected into a PCS, transfer of its producer members to another scheme or in the case of the producer member, security being taken to support their guarantee commitment. Under guidance from BIS, this arrangement can be provided for within the present operational plans as agreed between the Environment Agencies and the registered PCS schemes.

The Government, through BIS, should ensure that any specific financial guarantee funds held by the PCS on behalf of its members are properly ring fenced, separately accounted for in their management accounts and/or financial statements and safeguarded from the day to day operations undertaken by the PCS via a separately designated bank account. Under guidance from BIS, this arrangement can be provided for within the present operational plans as agreed between the Environment Agencies and the registered PCS schemes.

In Section 6.8 we illustrated the challenges for producers that can arise from recycling insurance and from blocked bank accounts.

Recommendation 10:

The Government, through BIS should take this opportunity to engage with the European Commission to determine what flexibility and/or discretion exists with the Directive for the

[126] As illustrated by the TXU case study referenced in section 6.8 of this report.
[127] These tests could mirror those that are standard practices such as a) audited financial statements and a clean audit on the scheme operator b) turnover c) profitability d) EBITDA and e) balance sheet strength.

provision of alternative financial instruments from producers (in addition to those already set out) that still provide for and meet the intended outcomes required.

Subject to this proviso, the Government, through BIS should determine the exceptional circumstances in which it will allow producers to bring forward their own alternative solutions that are convenient and appropriate to them and which are wholly acceptable to BIS. Under guidance from BIS, this arrangement can be provided for within the present operational plans as agreed between the Environment Agencies and the registered PCS schemes.

WEEE Data

Having an accurate data set for all WEEE (Household/Non-Household) will become even more important for the UK under the recast WEEE Directive.

Recommendation 11:

The Government should take the opportunity, through BIS, to review the present data set, the way in which the data is captured and that the inadvertent classification of items of equipment is minimised so as to ensure that it can effectively manage and monitor the UK's performance as a whole.

Enforcement

For regulation to be effective there needs to be effective and proactive enforcement across the sector by both the Environment Agencies (producer registration, environment permits), by BIS (DCF Sites) and the VCA (Retailers). With that said we are mindful of the current fiscal and related budgetary constraints.

Recommendation 12:

The Government, through BIS should take this opportunity to review the present enforcement regime to determine what is effective and what is not and the reasons as to why. Thereafter, it should ensure that it, the Environment Agencies (in consultation with Defra) and the VCA adopt a proactive risk based enforcement policy that targets specific parties and/or specific elements within the sector as a whole in order to promote compliance and tackle serious infringement of the regulations.

Design for Recycling and Reuse – Use of voluntary agreements

It is possible to achieve some outcomes through the use of voluntary agreements (e.g. common mobile phone charger) and this will be in line with the Government's policy on 'light touch regulation'.

Recommendation 13:

The Government should investigate, possibly through WRAP, whether there is the potential to extend the use of voluntary agreements into such areas as a) product light weighting, b) common polymers in plastics amongst others.

Dissemination of this report

Given the stakeholders that the working group has engaged with, both in the UK and abroad there is a significant level of interest in this report, the information that it contains and the conclusions and/or recommendations that it brings forward.

Recommendation 14:

The Government, through BIS should give consideration to making this report, in its entirety, a publicly available document at the earliest opportunity via a hyperlink on the BIS website.

Annexes

IPR Working Group

July 2012

Annex A: Austria

In Austria, the WEEE Directive has been transposed by WEEE Ordinance (Elektroaltgeräteverordnung EAG-VO) of April 29, 2005 and has been in force since August 13, 2005.

Scope

The Austria WEEE system covers all electrical appliances according to the ten product categories in the original WEEE Directive. These categories are consolidated by Austrian law into five categories: Large Appliances, Cooling Appliances, Display Screen Equipment, Small Electrical Appliances and Gas Discharge Lamps.

Producer Registration and Reporting

Austrian-based Producers, as well as retailers or foreign companies selling to Austria via telesales, must register online at http://edm.umweltbundesamt.at and must report annually the quantity of EEE sold in Austria.

According to the Austrian Ordinance on WEEE, producers and importers can either fulfil their future household WEEE obligations individually or by joining a Collection and Recovery Systems (CRS). To date, no Producer has chosen to fulfil the WEEE obligations individually.

By joining a CRS, the WEEE obligations and duties are transferred to the operator of the CRS. There are five CRSs (representing 2,047 producers at the end of 2009):

- ERA Elektro Recycling Austria GmbH (www.era-gmbh.at)
- European Recycling Platform (ERP) Österreich GmbH (www.erp-recycling.at)
- Erfassen und Verwerten von Altstoffen GmbH (www.eva.co.at)
- Umweltforum Haushalt Altlampen Systembetreiber GmbH (www.ufh.at)
- Umweltforum Haushalt Elektroaltgeräte System Betreiber GmbH (www.ufssystem.at)

To ensure fair competition, a coordination body called “the clearing house” was established, controlled by the Ministry of Environment. The clearing house is operated by Elektroaltgeräte Koordinierungsstelle Austria GmbH (EAK). EAK coordinates CRS activities and allocates pickup orders according to the CRS market share.

Producers must submit quarterly and annual reports to the clearing house (either directly or via a collective scheme).

Producer Financing

Producers are responsible for financing the collection, recovery and recycling of household WEEE.

In accordance to the Austrian Ordinance on WEEE, CRSs have to calculate their prices (recycling fees) based on the following criteria:

- The prices have to be calculated per collection and treatment category. A category consists of WEEE that is collected and recycled more or less the same way. There are 5 categories as listed above.

- The prices have to be the same for every client. e.g. it is not allowed to give quantity discount

- Cross-subsidies between the collection and treatment categories are not allowed

- The annual costs have to be covered by the annual revenues for each collection and treatment category

In Austria currently there are three common ways CRSs charge their customers (producers):

- A price per piece

  A price per piece is used to make it easier for the clients to collect the relevant data (market input of electronic equipment). It is often used for charging gas discharge lamps. Normally, collection and recycling of WEEE are charged per kg: the heavier the item the higher the price. If the prices are per piece it should be noted that within a sub-category the heavier item has a price “privilege”;

- Price per weight

Most costs are given in €/kg. Even if some services are offered in €/pcs (e.g. pick up of containers, rents for containers, it is recommended to fix collection costs in €/kg)it is guaranteed that the collection is efficient (no empty containers are picked up).

- Lump sum

For small volumes, it is inefficient to obtain information on the weight or the number of pieces. In this case, collective schemes are charging the producers of EEE a lump sum.

The following cost factors are taken into consideration for calculating costs by collective schemes:

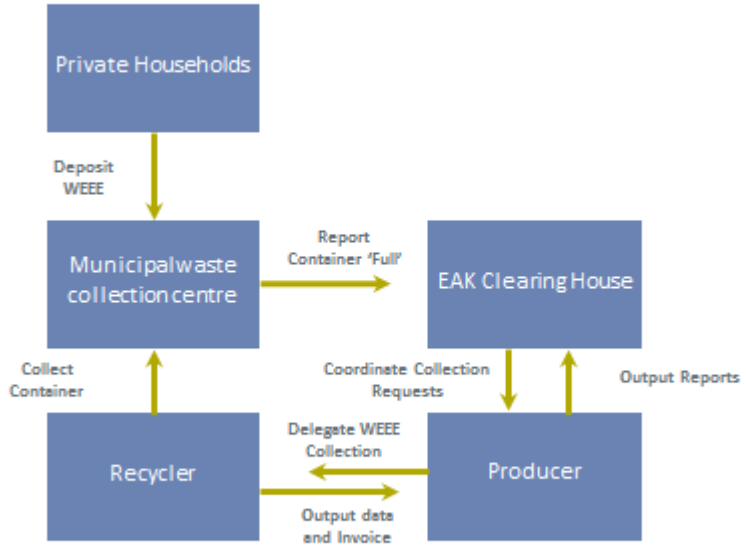
- Infrastructure (containers, municipal waste collection centres)
- Collection (transportation)
- Treatment (sorting, dismantling, treatment)
- Costs of collective schemes (staff, advisors, logistics)
- Contribution “Waste minimization” (CRS have to financially support minimization measures)
- Contribution to the “Clearing House” (regulating the competition between CRS in Austria)
- Revenues for material

Collection of Household WEEE

In Austria, WEEE is mainly collected via municipal collection centres. The CRSs are responsible for transporting waste from the municipal waste collection centres (1,770 in Austria collecting around 80% of WEEE). The number of collection centres per 10,000 inhabitants is between 1.4 (in the state of Upper Austria) and 3.4 (in the state of Styria). The CRSs pay for the infrastructure of the collection centres, but not for the staff.

As several CRSs use the same collection sites, transport is coordinated by the clearing house to manage traffic levels.Mobile collection of WEEE takes place in small rural municipalities without municipal collection centre.The collection system for household WEEE in Austria is represented in the schematic below:

Austria household WEEE collection system



Annex A: France

In France, the WEEE Directive has been transposed by Decree No. 2005-829. In 2010, France introduced a mandatory system of differentiated charges for six electronic products based on their DfRR features.

Scope

The French WEEE system covers all electrical appliances according to the 10 product categories in the original WEEE Directive.

Producer Registration and Reporting

Producers must identify annually the quantities of EEE placed on market, the quantities of WEEE collected and recycled and the quantities of components/substances extracted in WEEE treatment. A national register of producers is held by the French Environment Agency, ADEME.

Producers of household EEE must either (a) comply individually but seek approval or (b) join an accredited collective scheme. There is a choice of schemes named Eco-Organisms (EOs): Three general schemes (Eco-Systems, Ecologic and ERP) and a further scheme specific for lighting (Recyclum). **Note no household EEE producer is currently complying through an individual route.**

Producer Financing

Producers pay a fee for each product they supply onto the French market to their nominated EO. The fees vary according to both product and EO.

A standard % increase/decrease is applied to the product fee for six specific products based on specific design for dismantling, recovery and reuse (DfRR) criteria. Developing these criteria was a challenging and time-consuming process and the criteria were ultimately based on three fundamental principles:

- Life cycle and durability criteria;
- Hazardous material content; and
- Recycled content.

This % increase/decrease is mandatory and is standard across all EO's. The objective is to motivate DfRR changes for these specific products.

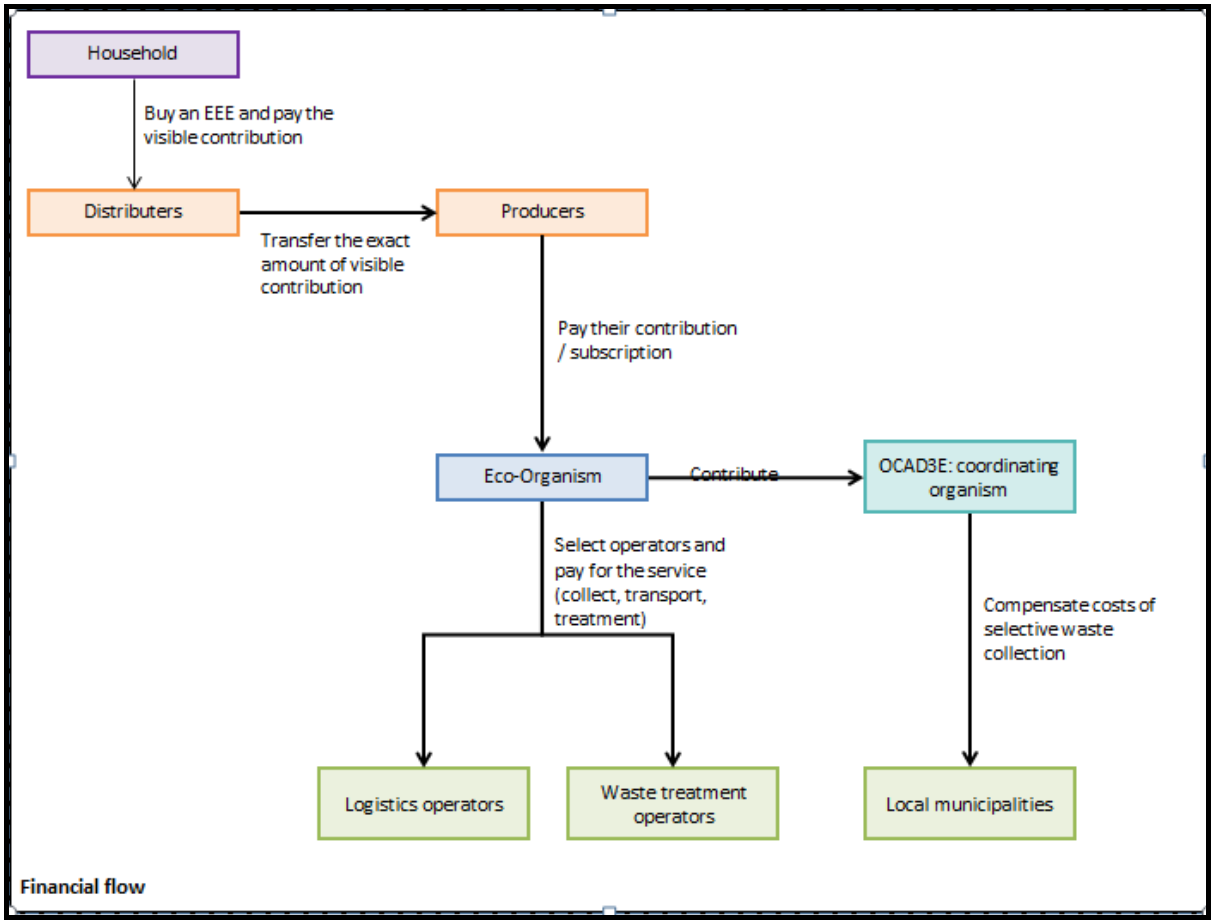
Equipment	Criteria for Increase/Decrease	Level of Differentiation
Category 1 Equipment producing cold with a refrigerant circuit	Usage of frigorific fluids having a GWP over 15	+ 20%
Category 2 Hoovers	Usage of plastic parts over 25g containing brominated flame retardants	+ 20%
Category 3 Mobile Phone	Absence of a universal phone charger (criteria applicable as soon as the international technical standard is published)	+100%
Category 3 Laptop	Usage of lamps containing mercury and usage of plastic parts over 25g containing brominated flame retardants.	+ 20%
Category 4 Television	Usage of lamps containing mercury and usage of plastic parts over 25g containing brominated flame retardants	+ 20%
Category 5 Lamp	Exclusive LED source	-20%

Each scheme has the flexibility to charge producers different fees according to the product characteristics. Each EO has devised a tariff of charges. A selection of some example charges (in Euros including tax) according to EO are shown below:

	ERP		Ecologic		Eco-Systems		Notes
	Not DfR	DfR	Not DfR	DfR	Not DfR	DfR	
Large HH (Not Cold) > 6kg	6		6		0.08 - 3.34		Eco-Systems' equivalent category is sub-divided into a series of specific product types.
Cold > 40kg	15.6	13	15.6	13	13.04	10.87	ERP's equivalent category is defined as products over 42kg.
TV /Monitors > 25kg	9.6	8	9.6	8	6.69	6.69	Eco-Systems' equivalent category is defined as screen size > 42" (not weight)
Mobile Phones	0.02	0.01	0.02	0.01	0.02	0.01	
Small Appliances <0.2kg	0.01		0.01		0.42		

In France, the producer can show this charge visibly on the sale of the product to the consumer, known as a visible fee or visible contribution. Distributors/ retailers and producers are not able to alter the value of this visible fee (eg add a margin).

The financial flow is depicted below.



Guarantees

Producers are only required to provide a financial guarantee if they are not a member of an EO. The financial guarantee would need to be sufficient to cover their producer obligations for the current year. This option appears not to have been taken up by any producers as all producers are members of an EO.

Collection of Household WEEE

France introduced a steadily increasing collection target for household WEEE, namely 8kg/inhabitant per year in 2012, 9kg in 2013 and 10kg in 2014. These collection targets are devolved down to the EOs according to their relative market share. The EOs have separately agreed to set minimum collection levels by category of WEEE.

France has a network of over 8000 collection points primarily operated by municipalities and retailers. Collection of WEEE is according to five categories: Large Cooling Appliances, Large Appliances, Screens and Small Appliances.

OCAD3E is a company which was established by the four EOs. The role of OCAD3E is to organise collection from municipalities. Municipalities receive financial compensation from OCAD3E in the form of a set amount for each collection point, a variable amount according to the tonnage of WEEE collected by the municipalities and financial support for public communication.

Each EO contracts with specific municipalities (through OCAD3E) according to their expected level of WEEE required to meet their collection target. Each EO is required to collect freely all the WEEE collected by the distributers. It is also required to collect the WEEE collected by local authority as long as the following formula is respected:

$$\frac{\text{WEEE tonnage already collected \& treated in year n}}{\text{WEEE tonnage selectively collected in year n from municipalities}} < \frac{\text{EEE tonnage declared by the EO Members}}{\text{EEE tonnage declared by all producers}}$$

A few municipalities act as ‘adjustment’ and an EO can switch collection from these municipalities for a given time if required to meet collection targets. Experience to date has shown that variation from anticipated collection levels has been small: limited to around 600 tonnes of the total of 400,000 tonnes collected WEEE.

Annex A: Germany

In Germany, the WEEE Directive has been transposed by Electrical and Electronic Equipment Act (ElektroG)

Scope

The German WEEE system covers all electrical appliances according to the 10 product categories in the original WEEE Directive.

Producer Registration and Reporting

Producers are required to register at the German Stfitung Elektronikaltgeräteregister (EAR)[1] or Clearing House, provide proof of financial guarantee and report on monthly basis the amount and type of products placed on the market to the EAR according to 10 WEEE categories. Producers are not required to provide any financial contribution to the EAR.

The EAR is a private organisation although it was originally established under statute. It has been transferred specific public powers and is overseen by the German Federal Environment Agency.

The EAR calculates market share for each producer by product category and this market share proportion is applied to the WEEE arisings. Producers must arrange for corresponding amounts of household WEEE to be properly recycled under instruction from the EAR.

Producer Financing

Producers' obligations for historic WEEE are based on market share, for new WEEE producers have two choices.

Producers' new WEEE obligations can be based on market share or they may opt for their obligation to be based on their share of WEEE by category in the waste stream. If they choose the second option, they must apply scientifically

[1] www.stiftung-ear.de

recognised statistical methods to calculate their obligation[2]. It seems that few, if any, producers calculate their new WEEE obligations via the second option.

Guarantees

Producers are mandated to provide annual evidence of an insolvency-proof guarantee for financing the collection and disposal of new household WEEE. This can be done via setting up provisions (such as insurance policy or a blocked bank account) covering the expected recycling costs.

The level of provision is calculated based on the type and weight of equipment predicted to be placed on the market by the producer in the next 12 months, expected lifetime and expected recycling costs based on data provided by the Clearing House. Some example data is provided below.[3]

Equipment	Predicted Return Rate (%)	Predicted Average Lifetime (months)	Average Cost of Treatment per collection group (Euro/tonne)
Cold Appliances, Air Conditioning units and Oil radiators,	75	120	220
Printers	27	84	230
Mobile Phone	27	84	230
TVs	50	60	230

[2] http://www.umweltkanzlei.de/Upload/Image/UBA-BE-FKZ_206_31_300_Teil_III.pdf

[3] http://www2.stiftung-ear.de/hersteller/regelsetzung_regelbuch/produktuebergreifende_arbeitsgruppe_pbue/regelsetzung_garantiehoehe

Equipment	Predicted Return Rate (%)	Predicted Average Lifetime (months)	Average Cost of Treatment per collection group (Euro/tonne)
Gas Discharge Lamps)	10	72	1300
Small Household Appliances	40	60	170

Collection of Household WEEE

There is a network of around 1600 collection points for household WEEE.

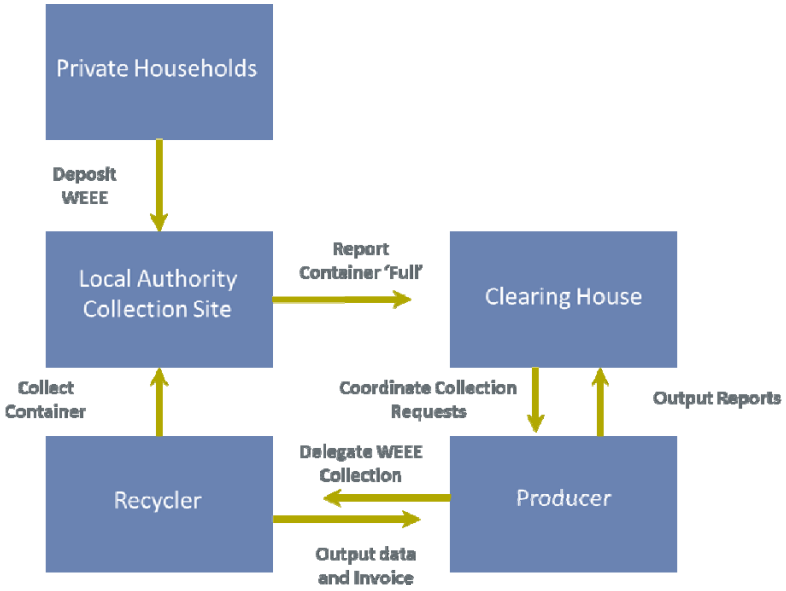
WEEE is collected by municipalities in five collection categories which (with the exception of cold appliances) reflect the recovery and recycling targets. The five collection categories are: Large Appliances; Cold Appliances; IT Equipment & Consumer Equipment including displays; Lamps; and Small Appliances. This differs from the situation in France and the UK where 'screens' are collected as a separate category. German municipalities can opt out of collection of certain categories.

The Clearing House assigns individual producers (or third parties acting on their behalf) a specific 'pick up' of household WEEE from a specific public collection point based on an algorithm[4]. The location of the collection point is not defined in advance and remains unknown until the Clearing House instructs the collection.

Any container of WEEE has to be removed and replaced by an empty container within 72 hours. Delays are fined up to 10,000 Euros per container by the German Federal Environment Agency. A producer can instruct a compliance scheme to manage these 'pick ups' on their behalf and ensure that the WEEE is delivered for appropriate treatment and recycling.

The process is depicted in the diagram below.

[4] http://www2.stiftung-ear.de/hersteller/abholkoordination_b2c/berechnungsweise/#


Private Households
Deposit WEEE
Local Authority Collection Site
Report Container 'Full'
Clearing House
Collect Container
Coordinate Collection Requests
Output Reports
Recycler
Delegate WEEE Collection
Producer
Output data and Invoice

Annex A: Sweden

In Sweden, the WEEE Directive has been transposed by Ordinance 2005:209.

Scope

The Sweden WEEE system covers all electrical appliances according to the ten product categories in the original WEEE Directive.

Producer Registration and Reporting

Producers (importers, manufacturers and retailers) are required to register with the Swedish EPA (Naturvårdsverket). The following information must be reported:

1. Quantities of EEE sold in Sweden and via distance selling to other EU countries.

2. Quantities of WEEE collected and treated for each calendar year.

3. Financial guarantee arrangements.

Producer Financing

The responsibilities regarding household WEEE differ depending upon whether the equipment was sold before 13 August 2004 (Historical waste) or after 13 August 2005 (New waste).

1. Historical waste: The producer has a collective responsibility for historical waste produced by products from the same product category. The portion of the costs that produces are responsible for is based on product category market share.

2. New Waste: Producers are responsible for waste produced from their products. For new waste the producer has two options: collective responsibility in the same way as for historical waste or individual responsibility.

The Swedish EPA reported that there are currently no producers taking individual responsibility for new waste[5].

Household collection centres are financed by Local Regional Authorities (LRAs). All other costs (sorting, treatment and recycling) are met by El-Kretsen and EÅF, the two producer compliance schemes.

Collection of Household WEEE

Local Regional Authorities (LRAs), or municipalities, are responsible for collecting and treating household WEEE. Household consumers may return WEEE to one of 650 waste recycling centres paid for by the municipalities free of charge. The municipalities are also responsible for the local monitoring of the collection system, and for informing consumers where they may dispose of their WEEE-products. WEEE is collected in separate bins owned by El-kretsen. The collective collection systems do not differentiate between new waste and historical waste.

El-Kretsen

El-Kretsen is a not for profit service provider set up in July 2001 to represent producers (manufacturers, importers and retailers) in their agreement with the Local Regional Authorities (LRAs) and to operate a voluntary nationwide take-back system.

El-Kretsen is responsible for sorting, treatment and recycling. Waste is sorted into three fractions at the point of collection: electronics, large white goods, and lighting. The transport of the waste from the collection centres to relevant recycling organisation is organised and financed by El-Kretsen, using subcontractors. Treatment and recycling firms are chosen on the basis of technical ability, location and price.

El-Kretsen provides 100% coverage of the Swedish Territory and has concluded standardised agreements with all 290 local municipalities to take responsibility for historic waste in return for the maintenance of collection sites.

Elektronikåtervinningsföreningen (EÅF)

EÅF, launched in 2008, uses its members' shops as collection points for household WEEE. EÅF has an agreement with El-Kretsen as member shops are not located in all municipalities.

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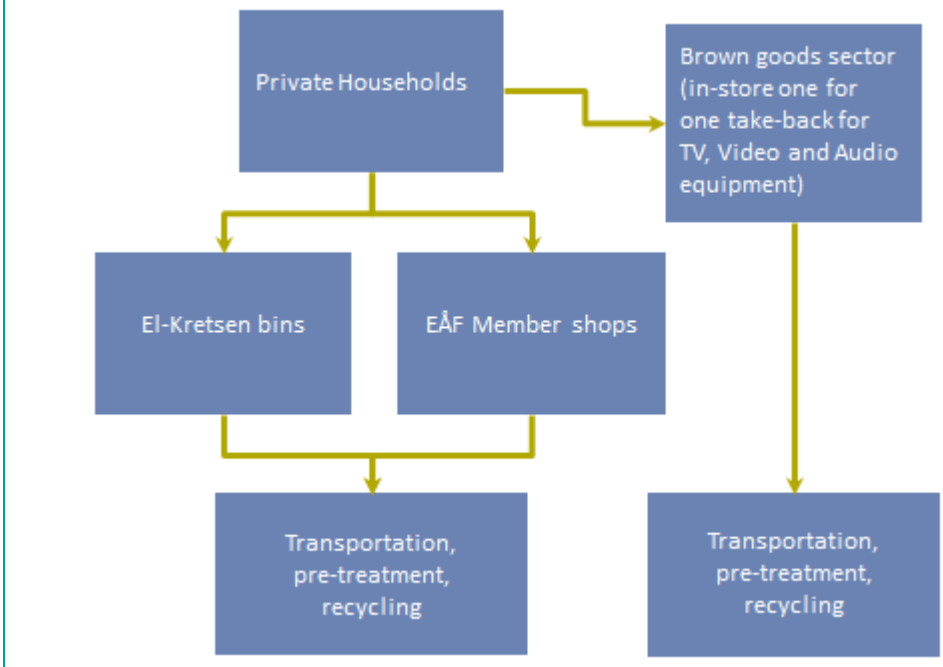
[5] Confirmed by email by Ingela Grudin, Adviser producer responsibility EE and batteries, Swedish EPA, Compliance, Grants and Enforcement Unit, TEL: + 46 10 698 12 46 EEfraga@naturvardsverket.se

The collection system for household WEEE in Sweden is represented in the schematic below:

Swedish household WEEE collection system



Financial Guarantees in Sweden

All Swedish producers must report how they will meet the requirements of the financial guarantee. It is not sufficient simply to be a member of a compliance scheme; a specific financial guarantee arrangement must be in place (albeit this could be arranged through the compliance scheme.) There are four alternatives detailed below[6].

El-Kresten Member Scheme

Producers choosing to join El-Kretsen are given the opportunity of being included in El-Kretsen's financial guarantee system. This system ensures there are sufficient funds to finance El Kretsen's operation in the forthcoming year, there is a reserve fund for the following year and that there is an insurance arrangement which would 'kick in' in the event of bankruptcy.

[6] http://www.swedishepa.se/Documents/publikationer/978-91-620-8421-9.pdf

Collective Trade Association Scheme

Members of El Kretsen can also establish their own insurance solution if they wish. For example, members of a trade organisation of white goods manufacturers known as the Elektriska Hushållsapparat Leverantörer (EHL - Household Electrical Equipment Service Providers) have established their own financial guarantee fund. The manufacturers contribute to a collective fund and the financial guarantee consists of an insurance taken out using the fund as security. The financial guarantee cost for 2012 is set at 5 SEK (EUR 0.58) per large appliances (refrigerator, freezer, cookers) and 1.4 SEK (EUR 0.16) per small appliances (vacuum cleaners, kitchen appliances). This collective fund would pay out if any of the companies went out of business.

EÅF Member Scheme

Members of EÅF use a different financial guarantee system to El-Kretsen members. The financial guarantee used by EÅF members is an insurance system whereby the producer pays an annual insurance premium based on the number of products sold and the recycling costs of the products. The insurance premium goes to a fund that finances the recycling costs for the electric waste of the producer. In case the producer goes into bankruptcy or leaves the market due to other reasons, the insurance company would continue to pay the recycling costs of the producer and thus ensure that the producer will not become a free-rider.

Blocked Bank Account

Some small companies choose to meet their financial guarantee requirement through setting up a block banked account which is pledged to the Swedish EPA should they go out of business.

Insurance Providers

Länsförsäkringar Alliance AB is the only insurance company offering recycling insurance to producers in Sweden. Their policy only covers products placed on the market after the insurance agreement has been made.

Länsförsäkringar recycling insurance is a long-term guarantee, usually for a period of 20 years, and provides cover for higher recycling costs in the future, thus reducing the uncertainty in the producer's balance sheet. When the producer releases the product into the market, a single premium is paid. The sum is invested and the investment income helps to keep the premium as low as possible. The Länsförsäkringar insurance premium is calculated based on the following key factors:

1. Nature of the product;

2. Estimated future recycling costs;
3. Risk that materials will be classed as hazardous in the future;
4. Risk of extended demands in the recycling process;
5. Expected increased efficiency in the recycling process; and
6. The estimated future value of metals.

Länsförsäkringar estimated that <1% of the 1,800 producers on the Swedish EPA EE register have recycling insurance agreements with them. For confidentiality reasons, Länsförsäkringar would not disclose information on their recycling insurance premiums[7].

[7] Patricia Seidel Garpedal, Head of Commercial Motor & Environment, Länsförsäkringar Sak Försäkrings AB (publ), Tel 08-588 415 69

Annex B: IPR Stakeholder Meeting, 22 March 2012

Outcome of Discussions within Break-Out Groups

Introduction

The audience was divided into 5 break-out groups. Each group was comprised of approximately 7 – 10 participants from a range of stakeholder factions, primarily Producer Compliance Schemes (PCSs) and large producers but also trade associations, waste management companies and a limited number of retailers. The groups discussed (a) proposed criteria for assessing options and (b) five example options.

Criteria

Participants were asked to comment on 13 proposed criteria which would be used by the IPR WG to assess possible approaches. The aim was to identify which criteria were most important for the stakeholders present, which criteria were considered redundant and any additions or amendments.

Taking the results from all groups and using the majority views to rank the criteria, the outcome is as follows:

TOP Priority	• "Support a collection infrastructure which is widely accessible and straightforward for consumers to use."
HIGH Priority	• "Use a cost allocation which is easy to understand, fair[8] and reasonable."
MEDIUM Priority	• "Reward producers that invest in Design for Recycling" • "Reflect the Government aim of reducing regulatory and administrative burdens on business" • "Meets requirements of Article 8.2"

The breakdown of results was as follows:

[8] One group suggested adding the term 'equitable'. Another group considered that 'fair and reasonable' were much more important than 'easy to understand'.

Criteria		Groups for whom this was a Priority issue	Stakeholder Views
1	Avoid producers accruing funds	✔	In general this received a split reaction. Only one group identified this as a priority criterion. Some participants were supportive (accruals for long life products would potentially represent significant burden) some negative (remove this criterion as any true IPR solution likely to require some form of accrual). One participant suggested that it should be replaced by '*Allows producers to control and reduce their future WEEE liabilities*' which was welcomed as a good solution by all within discussion group 2.
2	Financing orphan or non-branded products equitably	✔	
3	Cost allocation easy to understand, fair and reasonable	✔ ✔ ✔	**HIGH priority, with emphasis on fair and reasonable.** One group suggested adding 'equitable'.
4	Cost certainty	-	No votes. One group considered this desirable but a much lower priority than criterion 3.
5	Reward product durability	✔	
6	Reward DfR	✔ ✔	**MEDIUM priority.** Conversely some participants questioned if WEEE system could or should aim to fulfil this criterion ~ see later discussion in Options.
7	Enhance reuse/refurbishment	✔	
8	Minimum transport	✔	

	movements		
9	Reduce regulatory and administrative burdens on business	✔ ✔	**MEDIUM priority.**
10	Meet Article 8.2	✔ ✔	**MEDIUM priority.**
11	Reduce burden on SMEs	-	No votes. Two groups felt that this criterion could be removed as already covered by (9).
12	Straightforward for authorities to implement and enforce	✔	
13	Support a collection infrastructure which is widely accessible and straightforward for consumers to use.	✔ ✔ ✔ ✔	**TOP priority.** One group suggested replacing term 'consumer' with 'end users'.

An additional issue highlighted as the top priority by several producers and PCSs was 'access to WEEE'. It was felt that this would help to enable producers to predict costs and prevent others from dictating costs. These participants felt strongly that 'physical access to WEEE by producers/their PCSs' should be one of the top key criteria. One participant stated that this would be a "pre-requisite for any IPR system".

One group suggested that an additional criterion should be 'future proofing' – to ensure that the system would be financially robust in the long term and not collapse. For example, if a system was based on estimating future recycling costs were there sufficient safeguards for significant under-estimates? Similarly how would the system cope with product convergence?

Five Example Options

Each group was asked to comment on the 5 example options presented.

Two groups reached consensus on a preferred example, one group selected **Market Share: Independent Route** whilst another selected **Market Share: Mandated surcharges and reductions**.

The other groups did not state a preference for a specific example although most were not in favour of Return share or Payment for Own WEEE: Pure IPR approach. In general it was felt that these were too burdensome and costly to implement for insufficient reward. Payment for Own WEEE: Front end option was not easy for participants to grasp and it was felt by many that further explanation would be required in order to give a full considered opinion.

Key points raised were as follows (N.B. stakeholder comments reported verbatim without critical assessment):

Example	Positive Comments	Negative Comments	Conclusions / Suggestions
Market Share: Independent Route	Straightforward and practical for business Easier to implement than options 3, 4 or 5	Does not provide incentive for DfRR or product durability Is not IPR Would require stringent financial guarantees for producers operating individually	One group concluded that this was their preferred Option either as described or by maintaining the current system but ensuring producers/their PCSs had unfettered access to WEEE. One group suggested that existing Protocols could be broken down to lower levels to reward DfRR within the current system. Orphans – some participants suggested that reserve fees could be held by EA to cover risk although others felt this would be outside the scope of EA.
Market Share: Mandated surcharges and reductions	Potential to meet all criteria and practicality Easier to implement than options 3, 4 or 5	Issues over how to set surcharges Concern that factors set under the French system are very simplistic/ arbitrary Costly administrative burden on producers. Highly complex to report data requirements on a product level. Little enforcement/few producer audits under the French system. Producers 'self-	One group concluded that this was their preferred Option on the basis that it provided a DfRR incentive whilst maintaining practicality and low administrative burden.

		declare'.	
Return Share: Brand sampling or counting	Rewards product durability	Does not incentivise DfRR. Reallocation of costs for no environmental benefit. Would discourage separate collection Affluence in different regions will influence sampling results Sampling can place exaggerated responsibility on large brands which are easy to identify Complex to implement Little brand differentiation for some product categories e.g. lamps Problems identifying producer responsible for each brand (due to definition of producer, multiple importers etc)	System needs to be able to cope with practical situations/difficulties, for example: • the same brand being put on the market by a number of different producers (eg. importers), and you can't tell by looking at the product; • brands changing between different producer over the years, for example transferring to another company (Braun to P&G) or importers switching suppliers from one year to the next. Need to know who was the producer when it was actually imported? • producers with thousands of product lines which may be changing several times per year.
Payment for Own WEEE: Pure IPR approach	Japanese system works well	Not practical Does not meet criteria 9, 11, 12 or 13 If consumers had to return WEEE to producers directly (not via DCFs) it would reduce accessibility and probably lead to reduced collection rates Scepticism that UK consumers would utilise such a system to the same degree of compliance as	See comments above on brand identification/ definition of producer.

		consumers in Japan Problems identifying producer responsible for each brand Any sorting by brand would be very costly	
Payment for Own WEEE: Front end financing	Rewards DfRR	Difficult to understand at present Similar to example 2 (mandated surcharge/ reduction) but more elaborate and complex. Actual costs likely to differ considerably from estimates so option 2 may be more practical and lower administrative burden.	More explanation required - not fully understood by all participants

General Comments from participants:

- There appears to be a trade-off between (a) 'fairness' or rewarding DfRR and (b) simplicity, practicality and low implementation costs. No participants identified a win-win option or silver bullet either from amongst the examples provided or any alternative proposals.
- The suitability of options will differ per product category. An option may be better for one product category but worse for another.
- Flexibility and a hybrid approach may be needed. IPR could be applied to specific product categories. The IPR mode within that category could also be flexible as illustrated by Maine where producers can opt to accept a return share of mixed products or can pay for their own brand to be segregated.
- Changing over to an 'IPR' system could lead to painful 'double costs' for producers in the transition phase – where producers have to pay simultaneously for WEEE arising and WEEE POM.

- Participants were split in their overall opinion on IPR. Some were very positive about the opportunities and competitive advantage it could provide. Others questioned the benefits and thought that incorporating individual financial responsibility via the UK WEEE Regulation was simply too burdensome and the potential benefits not substantive enough to incentivise design change. Instead they argued that other policy tools such as the ErP Directive should be used to mandate relevant DfRR requirements.
- The main point of consensus was on the issue of ensuring that producers/their PCSs had access to WEEE. This was considered by many to be a pre-requisite for any 'IPR' approach.

Annex C: Independent Evaluation of Options

Following the stakeholder event and review of criteria, each of the five options was evaluated by the consultants and given a score from 0 (not met) to 10 (fully met) for each criterion. The results are presented in the table below.

It was found that some elements were difficult to score due to a number of possible variants within each option and that inevitably scoring is open to a degree of subjectivity.

The scores are presented as colours where:

- Green (**GREEN**) indicates a positive high score i.e. it performs well and fully meets or addresses the issue;
- Yellow (YELLOw) a medium score i.e. it partially meets or addresses the issue;
- Red (**RED**) a negative low score i.e. it performs poorly and does little to meet or address the issue.
- Paler gradations are used in between e.g. pale green = relatively high score, orange = relatively low score.

The scoring process identified a number of key points:

- 'Payment for own WEEE: Front end payment by set product differentials' performs well for all the weighted criteria which were considered most important by stakeholders attending the event and had only minor weaknesses in respect of other criteria;
- Return share also performed well overall with minor weakness on the weighted criteria regarding incentives for DfR and reuse/refurbishment but showed significant weakness on criterion 3 (cost certainty);
- 'Payment for own WEEE: Collaborative IPR Approach' illustrates significant shortcomings relating to the provision of collection infrastructure (the top stakeholder priority);

- The market share approaches perform poorly due to the failure to meet the criteria relating to Article 8.2 or incentivise DfR (Design for Recycling) which are both medium priorities for stakeholders;

- The assessment process failed to capture two important issues in sufficient detail: (a) the extent to which an option is practicable for the UK and (b) the likely costs of implementation.

Criterion		Market Share: Independent Route	Market Share: Mandate Surcharges/ Reductions	Return Share: Brand Sampling or Counting	Payment for Own WEEE: Collaborative IPR Approach	Payment for Own WEEE: Front End Payment by set product differentials
1	Provide a robust mechanism for financing the treatment of orphan or non-branded products equitably					
2	Use a cost allocation which is easy to understand, fair and reasonable					
3	Offer producers cost certainty					
4	Reward producers that invest in Product Durability					
5	Reward producers that invest in Design for Recycling (DfR)					
6	Enhance reuse/refurbishment					
7	Support minimum transport movements associated with WEEE collection and management					

Criterion		Market Share: Independent Route	Market Share: Mandate Surcharges/ Reductions	Return Share: Brand Sampling or Counting	Payment for Own WEEE: Collaborative IPR Approach	Payment for Own WEEE: Front End Payment by set product differentials
8	Reflect Govn aim of reducing regulatory & administrative burdens on business					
9	Meet the requirements of Article 8.2					
10	Straightforward for authorities to implement and enforce					
11	Support a collection infrastructure which is widely accessible and straightforward for consumers to use					
OVERALL RANKING after weighting and scoring(1 = highest, 5 = lowest scoring)		5	4	2	3	1

Annex D: DfRR Weighting Option

This Annex provides further detail about the DfRR[9] Weighting Obligation which was devised by the Consultants

Summary

The basic premise of this approach is to ensure that:

a) WEEE compliance costs paid by producers are used to fund current WEEE arising
   ⇨ in order to avoid any double payment period;

b) WEEE compliance costs paid by producers reflect the costs of collecting and treating products currently being put on the market (POM)
   ⇨ in order to move towards meeting Article 8.2
   ⇨ in order to provide an immediate financial incentive to sell products which are easier and cheaper to collect, treat, re-use or recycle at end of life (EOL);

c) Compliance can be achieved either via a Producer Compliance Scheme (PCS) or independently (whereby the producer organises their own take-back of mixed or own brand WEEE) and enables (b) to be applied to equally to both compliance routes.

This approach involves the appropriate authority applying a weighting mechanism (specified percentage increase/decrease) to producers' obligated tonnages of WEEE arising. The percentage increase/decrease is based on specified features of products that the producer is currently placing on the market, which have a significant impact (positive or negative) on the cost of re-use, repair, refurbishment or recycling[10]. The weighting mechanism can be applied irrespective of how a producer's obligated WEEE tonnage is calculated.

[9] DfRR = Design for Re-use, Repair, Upgrade and/or Recycling

[10] The DfRR weighting option builds on concepts such as the French bonus/malus system but aims to strictly identify and define criteria and percentages in accordance with impacts on EOL costs as discussed later in this Annex.

Reducing or increasing a producer's obligated tonnage of WEEE arising within a product category is used as proxy for differences in collection and treatment costs of products currently being POM[11]. The weighting mechanism therefore provides a way of reflecting, in a relative rather than absolute form, the costs of collecting and treating products currently being POM whilst funding WEEE arising. This aligns with the principle of evolution rather than revolution in so far as taking the first step of the journey is concerned.

Applying a DfRR Weighting– Step by Step

This section aims to outline step by step how a DfRR weighting obligation would work.

Step 1: Identify Basis for determining Obligated Tonnages

The first step is to identify the basis for determining producers' obligated tonnages of WEEE arising within each product category. For example:

a) market share (as per current UK system);

b) obligated tonnage based on specified collection targets[12].

Whichever basis is selected would then be set out within the UK WEEE Regulations and applied to all producers on a mandatory basis. The outcome is that each producer (potentially via its scheme) is allocated a specific weight of WEEE arising that they must fund within each product category.

The remit of this report does not enable a detailed analysis of the merits of setting obligated tonnages based on specified collection targets, compared to the existing market share calculation. This comparison would need to consider a wide range of factors within the UK WEEE system e.g. trading issues and how to address them, current and predicted collection volumes and so on. In accordance with meeting the IPR Working Group (IPR WG) Terms of Reference, the focus of the proposed approach is the application of a weighting mechanism to these obligated tonnages and is independent from how the obligated tonnages are originally calculated. It is the weighting mechanism which will enable the costs of collecting and treating products currently being POM to be taken into consideration whilst funding WEEE arising.

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[11] The concept of altering obligated tonnages is outlined in *Fair and Efficient Implementation of Product Take-Back Legislation with Collective Producer Responsibility*, L. Gui, A. Atasu, O. Ergun, B. Toktay. Georgia Tech. Working Paper, 2012. The DfRR weighing option adopts elements of this approach.

[12] For further details on using collection targets to set obligated tonnages see Section 2.

Step 2: Identify Product Differentials

The next step is to identify the key differentials within a particular product group that make one product cheaper to re-use, repair, refurbish or recycle than another. Both existing and new /emerging products and their technologies need to be considered. Differentials could relate to material composition, durability, disassembly or ability to upgrade for example. The key requirements are that each criterion identified:

a) Has a significant impact (positive or negative) on the cost of re-use, repair, refurbishment or recycling within a particular product group;

b) Has no trade-offs or unintended consequences in terms of other environmental impacts which cannot be addressed via other policy measures (e.g. a type of backlight within a display product may be very costly to recycle but very energy efficient. Identifying this as a differentiator on the basis of its recycling impact would be fine as long as other policy measures were able to address the energy efficiency aspect);

c) Can be easily and definitively measured i.e. yes a product meets the criterion or no it does not.

Once the criterion has been identified, it is allocated a percentage increase/decrease based on (a). For example, if products which meet the criterion are on average cheaper to recycle than products which don't meet it, then a set percentage reduction should be allocated to that criterion.

An investigation needs to be undertaken involving producers, re-use organisations and AATF[13] operators amongst others in order to identify valid criteria and the associated percentage increase/decrease.

Possible Product Differentials

It would be possible, for example, to develop differentials for category 11 (displays). Until relatively recently, displays have contained a mercury-containing (Hg) backlight. However, displays with an LED (mercury-free) light source are now gaining market share. Given that mercury is hazardous and mercury containing backlights require special treatment, displays with a mercury-free backlight should in theory be cheaper to recycle assuming other variables remain unchanged. A criterion could therefore be 'Backlight containing mercury above *x* ppm'

[13] AATF = Approved Authorised Treatment Facility

Some preliminary ideas for other criteria include:

- All Categories: Larger plastic parts are coated or painted with materials known to inhibit the recycling process.
- All Categories: Larger plastic parts are not marked with polymer type.
- All Categories: Plastic enclosures contain glued or moulded-in metal inserts.
- Category 3: Equipment has more than ‘x’ different screw fixings (compromising efficiency of upgradeability processes).

The criterion should be updated on a regular basis (e.g. annually) to take into account developments in product technology, treatment requirements and recycling processes. Significant changes to relevant commodity prices could also be considered if relevant and feasible. To enable sufficient review and revision, the criteria and the associated percentage increase/decrease values would not be specified in the UK WEEE Regulations. However, the *process or procedure* for agreeing and implementing the percentage increase/decrease should be specified in the legal text.

Step 3: Apply Weighting Mechanism

The third step is to apply the weighting mechanism to the obligated tonnage calculated in Step 1. This is how key differences in the costs of collecting and treating products currently being POM are applied to WEEE arising.

Producers would report their products POM within the product categories as at present (or as per the new product categories listed in the Recast). In addition, producers would report data within sub-categories based on the criteria set in Step 2. For example, when reporting displays, producers would need to report the weight of displays POM with mercury backlights and the weight of displays POM with a mercury-free lighting source.

The relevant authority (e.g. the Environment Agencies) would apply the specified percentage increase/reduction to the relevant sub-category and calculate the obligated volume of WEEE arising. This could be done either per PCS or directly for each producer depending on how the system was implemented. Ultimately each producer would be notified of their obligated tonnage either directly by the authorities or via its PCS.

There are several variations on how the percentage increase/decrease could be applied to the obligated tonnages. This could involve either a simple multiplier or a reallocation mechanism. Both are illustrated below as worked examples.

Weighting Mechanism - Worked Examples

This section details some worked examples to demonstrate the impact of the weighting mechanism depending on how the weighting is applied.

- Example A assumes that a producers obligations is calculated based on market share.

- Examples B and C assume that a producers obligation is calculated according to a specific collection target.

In each worked example:

- The criterion used as the differentiator is the presence (or absence) of Hg backlights in displays. In most examples Hg backlights are given a penalty in the form of a 20% increase. In the last example LEDs are given an incentive in the form of a 20% decrease;

- The tonnages put on the market by Producer A and Producer B are kept consistent throughout.

    - Producer A places on the market 10 tonnes of displays with Hg backlights and 90 tonnes of displays with LED backlights.

    - Producer B places on the market 50 tonnes of displays with Hg backlights and no displays with LED backlights.

There are 3 parts to each worked example:

1. Explains the steps involved.

2. Details the calculations

3. Summarises the impact on each producer's obligation.

Worked Example A – apply weighting in a current market share system

Step 1	Producer's obligated tonnage is calculated based on current market share
Step 2	A 20% increase is applied to displays with mercury (Hg) backlights
Step 3	The 20% increase to displays with Hg backlights can be applied in two ways: *Example A1 "Simple multiplier"*: apply 20% increase to the weight of displays with Hg backlights POM. *Example A2 "Reallocation"*: apply 20% increase to the market share for Hg backlights and then reduce the LED backlight market share accordingly.

Example A1 "Simple multiplier": apply 20% increase to the weight of displays with Hg backlights POM.

Total amount of WEEE arising = 100 tonnes.							
Producer A				**Producer B**			
POM	**POM apply 20% Hg increase**	**Market Share after 20% Hg increase**	**Obligated volume of WEEE arising**	**POM**	**POM apply 20% Hg increase**	**Market Share after 20% Hg increase**	**Obligated volume of WEEE arising**
10 tonnes Hg	10 x 1.2 = 12 tonnes	(12/162) x 100 = 7.4%	7.4% of 100 = 7.4 tonnes	50 tonnes Hg	50 x 1.2 = 60 tonnes	(60/162) x 100 = 37%	37% of 100 tonnes = 37 tonnes
90 tonnes LED displays	90 tonnes	(90/162) x 100 = 55.6%.	55.6% of 100 = 55.6 tonnes	0 tonnes LED displays	0 tonnes		0% of 100 = 0 tonnes

Example A2 "Reallocation": apply 20% increase to the market share for Hg backlights and then reduce the LED backlight market share accordingly.

Total amount of WEEE arising = 100 tonnes.							
Producer A				**Producer B**			
POM	**Market Share under current system**	**Market Share 20% Hg increase + removal from LED**	**Obligated volume of WEEE arising**	**POM**	**Market Share under current system**	**Market Share 20% Hg increase + removal from LED**	**Obligated volume of WEEE arising**
10 tonnes Hg	6.67%	6.67% X 1.2 = 8% *i.e. additional 1.33% is incurred*	8% of 100 = 8 tonnes	50 tonnes Hg	33.33%	33.33% x 1.2 = 40% *i.e. additional 6.67% is incurred*	40% of 100 tonnes = 40 tonnes
90 tonnes LED displays	60%	60% **– 1.33% – 6.67%** = 52%. *Remove 1.33% and 6.67% from LED market share.*	52% of 100 = 52 tonnes	0 tonnes LED displays	0%		0% of 100 = 0 tonnes

The following table summarises the impact on obligated tonnages for Producer A and Producer B compared to the current market share approach.

Producer obligation based on:	Producer A obligated tonnage	Producer B obligated tonnage
Current Market Share approach.	66.7	33.3
Market Share with simple multiplier applied	63	37
Market Share with reallocation method applied	60	40

Under the reallocation method outlined in Example A2, the penalty on the Hg backlight increases significantly as the rest of the market moves towards Hg-free. This incentivises rapid market change but places an increasing cost on the last few Hg backlight display producers. A cap could be implemented to prevent excessive costs falling on the remaining minority of producers.

The simple multiplier used in Example A1 is much easier to apply, particularly in a market such as the UK with thousands of producers. In addition, the penalty on the Hg backlight remains more constant which is in line with Article 8.2. Depending on the economics, the penalty on the Hg backlight under example A1 may or may not be sufficient to stimulate market transition.

Worked Example B – apply <u>increased</u> weighting in a system where targets are based on 45% POM

Step 1	Producer's obligation is based on a 45% POM collection target[14]
Step 2	A 20% increase is applied to displays with mercury (Hg) backlights
Step 3	The 20% increase to the obligated volumes for displays with Hg backlights can be applied in two ways: *Example B1 "Simple Multiplier"*: apply the 20% increase to displays with Hg backlights. Other products within the category remain unaffected e.g. LED displays. The total weight of obligated WEEE within a product category increases above the 45% POM target. The cost 'penalty' on the Hg backlight displays remains constant and does not change over time; *Example B2 "Reallocation"*: apply the 20% increase to displays with Hg backlights and reduce the weight for non-Hg backlight displays accordingly. The total amount of obligated WEEE within a product category remains constant at the 45% POM target. The cost 'penalty' on the Hg backlight displays remains constant and does not change over time.

Example B1: apply 20% increase to displays with Hg backlights. This increases the total obligated volume required.

Producer A POM	**Producer A Obligated tonnage WEEE arising based on 45% POM**	**Producer A Obligated tonnage 20% Hg backlight increase applied**	**Producer B POM**	**Producer B Obligated tonnage WEEE arising based on 45% POM**	**Producer B Obligated tonnage 20% Hg backlight increase applied**
10 tonnes Hg[15]	4.5 tonnes	4.5 **x 1.2 = 5.4 tonnes**	50 tonnes Hg	22.5 tonnes	22.5 **x 1.2 = 27 tonnes**

[14] 45% has been selected for illustrative purposes only. Although an obligated tonnage based on a 45% POM collection target would be based on the previous 3 years figures as per the draft WEEE recast text on collection targets, we have provided one POM figure for the worked examples for simplicity. Further discussion of setting obligated tonnages based on a % POM target is provided in Section 2.3.

		i.e. an additional 0.9 tonnes is incurred			*i.e. an additional 4.5 tonnes is incurred*
90 tonnes LED	40.5 tonnes	40.5 tonnes	0 tonnes LED	0 tonnes	0 tonnes

Example B2: apply 20% increase to displays with Hg backlights and remove the additional volume from LED backlights. This keeps the total obligated volume the same.

Producer A POM	**Producer A Obligated tonnage WEEE arising based on 45% POM**	**Producer A Obligated tonnage** **20% Hg backlight increase applied + removed from LED**	**Producer B POM**	**Producer B Obligated tonnage WEEE arising based on 45% POM**	**Producer B Obligated tonnage** **20% Hg backlight increase applied + removed from LED**
10 tonnes Hg	4.5 tonnes	4.5 **x 1.2 = 5.4 tonnes** *i.e. an additional 0.9 tonnes is incurred*	50 tonnes Hg	22.5 tonnes	22.5 **x 1.2 = 27 tonnes** *i.e. an additional 4.5 tonnes is incurred*
90 tonnes LED	40.5 tonnes	40.5 **– 0.9 – 4.5 = 35.1 tonnes** *Remove 0.9 tonnes and 4.5 tonnes from LED incurred obligation.*	0 tonnes LED	0 tonnes	0 tonnes

[15] Note, in this example the percentage increase could be applied to the product weight POM (column 1) or to the obligated tonnage (column 3) – the end result would be the same i.e. the same volume of obligated tonnage would result.

The following table summarises the impact on obligated tonnages for Producer A and Producer B compared to a standard 45% POM target.

Producer obligation based on:	Producer A obligated tonnage	Producer B obligated tonnage
45% POM obligation	45	22.5
45% POM obligation with simple multiplier applied	45.9	27
45% POM obligation reallocation method applied	40.5	27

Worked Example C - apply decreased weighting in a system where targets are based on 45% POM

Step 1	Producer's obligated tonnage based on 45% POM collection target
Step 2	A 20% decrease is applied to LED backlight displays
Step 3	Apply a 20% decrease with reallocation. The % decrease to the obligated tonnages for displays with Hg backlights can only be applied as a reallocation. If a percentage decrease is applied as a 'simple multiplier' with no reallocation then the total obligated tonnage would be reduced below the national 45% POM target. *Example C1 "Reallocation"*: apply a 20% decrease to displays with LED backlights and reallocate the saved volume to displays with Hg backlights. The total volume of obligated WEEE within a product category will remain the same i.e. remains at the 45% POM target. The cost benefit to the LED displays remains constant and does not change over time. The cost 'penalty' on the Hg backlight will increase as the tonnage of LEDs POM increases.

Producer A POM	**Producer A Obligated tonnage WEEE arising based on 45% POM**	**Producer A Obligated tonnage 20% LED reduction applied + reallocated to Hg**	**Producer B POM**	**Producer B Obligated tonnage WEEE arising based on 45% POM**	**Producer B Obligated tonnage 20% LED reduction applied + reallocated to Hg**
90 tonnes LED	40.5 tonnes	40.5 x 0.8 = 32.4 tonnes *Allocate 8.1 tonnes saved to Hg market share.*	0 tonnes LED	0 tonnes	0 tonnes
10 tonnes Hg	4.5 tonnes	4.5 + 1.35 = 5.85 tonnes	50 tonnes Hg	22.5 tonnes	22.5 + 6.75 = 29.25 tonnes

The following table summarises the impact on obligated tonnages for Producer A and Producer B compared to a standard 45% POM target.

Producer obligation based on:	Producer A obligated tonnage	Producer B obligated tonnage
45% POM obligation	45	22.5
45% POM obligation with reallocation method: 20% LED reduction	38.25	29.25

Weighting Mechanism –Further Points of Discussion

Does it meet Article 8.2?

One of the primary points of discussion regarding the weighting mechanism is, 'does it meet Article 8.2'?

Clearly it is not possible for the IPR WG to give a legal judgement on this. It will also be affected by the calculation used to define producers' obligated tonnages (i.e. Step 1). There was no consensus within the IPR WG on whether the weighting mechanism, if applied to market share or a specified collection target, meets the letter of Article 8.2. Some felt that it does because it adjusts the costs paid by producers to reflect the EOL costs of their own EEE being put on the market. Others felt that it didn't because it alters the obligated tonnages, and that this goes against the requirements of Article 8.2. If comprehensive criteria are developed over time, it is fair to say it would represent a significant step towards Article 8.2. Given its application is primarily administrative (i.e. it does not involve any major changes to collection or infrastructure investment by producers) it also leaves the door open to a true 'payment for own WEEE' model in future.

Weighting Mechanism Criteria – How to set the product differentials

Arguably the most significant disadvantage of the weighting mechanism is the need to devote time and resources to investigate key product differentials which affect EOL and transpose these into accurate criteria with associated weightings. There are two elements to this discussion:

1) What should be taken into consideration when developing criteria to ensure they are effective and minimise additional data burdens for producers;

2) What process should be used to set the product differentials initially and to review them on a regular basis; bearing in mind the need to minimise time and resource implications.

Key requirements for product differentials and criteria

The key requirements for the product differentials are that each criterion identified:

a) Has a significant impact (positive or negative) on the cost of re-use, repair, refurbishment or recycling within a particular product group; and

b) Has no substantial trade-offs or unintended consequences in terms of other environmental impacts which cannot be addressed via other policy measures. To give a hypothetical example, a type of backlight within a display product is cheaper to recycle but not as energy efficient as others on the market. Identifying this backlight technology as a differentiator and applying a reduction on the basis of its recycling cost may be acceptable if other policy measures e.g. minimum energy efficiency requirements were in place to address the trade-off;

c) Can be easily and definitively measured i.e. yes a product meets the criterion or no it does not.

The aim of the weighing mechanism is to move towards meeting Article 8.2. To meet this aim it is important that the scope is limited to point (a) and that the percentage allocated is an accurate reflection of the differences in EOL costs. The IPR WG recommend that whilst the weighting should take into consideration any trade-offs in terms of product environmental impact, it should not become a wider policy tool at this time.

Secondly, criteria will be both more effective and less burdensome if they are consistent with other policy instruments and harmonised with similar criteria relating to EOL impacts e.g. within the French bonus malus, European Green Public Procurement or UK Government Buying Standards, EU Eco-label, EPEAT.

Criteria could be written to enable a default ‘no pain’ option to minimise data burdens on producers. If a producer (e.g. importer of multiple, frequently changing brands) cannot easily access the product information required to report against the specified criteria, they could report against the ‘default’ category. This would mean that they did not receive any incentive or benefit, but were not overtly penalised for being unable to report POM data against a sub-category. The benefit is that it reduces data burdens on such producers, the disadvantage is that it reduces the DfRR impact.

Development and Agreement of Criteria

There are a number of options for how criteria could be developed, several of which could be combined. Each will have different implications in terms of the level of time and resources required and from whom[16]. Possible options aree:

- Request that producers and waste management companies agree proposals for criteria within each product category, along with supporting evidence. These would be reviewed by a central authority (e.g. DEFRA), organisation (e.g. WRAP) or steering committee.

- Establish a Technical Advisory Committee (TAC) to develop the criteria and consult with relevant stakeholders where required;

- Request that the Market Transformation Programme develops initial proposals for review by DEFRA, BIS and WRAP;

- Commission a consultancy study including stakeholder consultation and these reviewed by central authority or TAC or consultancy study and consultation.

Applying the weighting mechanism – Simple Multiplier or Reallocation?

There are two options for applying the weighting mechanism as illustrated in the worked examples above.

- Under the reallocation examples, the application of the differential makes no change to the total volume of WEEE which is treated. As any reduction is reallocated to the non-DfRR product share.

- In comparison, if a simple increase was applied, this would mean that some producers would have a higher obligated volume and there is an increase in the total volume of WEEE which is treated.

The decision on whether to apply a reallocation or a simple increase/decrease could be based on the current volumes of WEEE available within a category and what level of change is feasible (the reallocation method would result in faster market change if technologically/economically feasible).

[16] IPR WG members who didn't favour this option were concerned about the level of time and resources which could be incurred in setting the criteria and percentages.

ANNEX E

IPR – Working Group

Aims and Terms of Reference

Aims

To provide BIS and the Minister with a report comprising:-

1. Views from the sector on IPR, and;

2. An analysis of the benefits and consequences of implementing IPR in the UK, and;

3. A recommendation if, and if so, how, IPR could be practically and realistically implemented in the UK.

Terms of Reference

Background

The UK, along with a number of other Member States of the EU, has not transposed all aspects of Article 8.2 of the WEEE Directive; and therefore full individual producer responsibility is not possible in the UK. The current system for Household WEEE compliance in the UK is based on collective producer responsibility within which producers are apportioned the end of life cost of their products based on their market share. Similar 'collective' producer responsibility systems have been chosen by other Member States in implementing the WEEE Directive.

IPR, as originally envisaged, was intended to "*create an economic incentive for producers to adapt the design of their products to the prerequisites of sound waste management. IPR was seen as a means of encouraging the design and production of electrical and electronic equipment which takes into full account and facilitates the repair, possible upgrading, reuse, disassembly, and recycling of WEEE".*

With collective producer responsibility there is no differentiation of the recycling costs according to how easy the product is to recycle. The costs are based upon the market share of the producer. Therefore the costs of recycling will be the same for a product that has been designed to be easier to recycle, and a product that is much more difficult to disassemble and recycle. Therefore collective responsibility -does not provide an incentive to a producer to design products to be easier to recycle.

Introduction

Article 8 of the WEEE Directive distinguishes between 'future' and 'historic' WEEE. The Directive states that producers should be collectively responsible for financing historic WEEE that is products put on the market before 13th August 2005. This is because it is

not possible for producers to influence the design of products that have already been produced. This establishes a market share responsibility for historic WEEE.

For 'future' WEEE, design changes can make products easier to disassemble, more recyclable and less harmful to the environment. Therefore Article 8.2 of the WEEE Directive establishes an Individual Producer Responsibility for 'future' WEEE, obliging producers to finance the costs of recycling their own products.

There is a common misunderstanding that IPR is the same as establishing an individual recycling system. This is not the case. Table 1 illustrates this difference. The WEEE Directive requires that for products placed on the market after 13 August 2005, producers are financially responsible for their own products, rather than collectively financing these costs (i.e. based on market share). However to fulfil IPR, producers have a choice between establishing individual or collective recycling systems.

Individual Producer Responsibility (Article 8.2) For products put on the market after 13 August 2005, each producer shall be responsible for financing the operations referred to in paragraph 1 relating to the waste from his own products. The producer can choose to fulfil this obligation either individually or by joining a collective scheme	Individual Recycling Systems An "individual recycling system" is a recycling system managed by only one producer. An "individual recycling system" is not equal to "individual producer responsibility".
Collective Producer Responsibility (Article 8.3) The responsibility for the financing of the costs of the management of WEEE from products put on the market before the date referred to in paragraph 1 (historical waste) shall be provided by one or more systems to which all producers, existing on the market when the respective costs occur, contribute proportionately, e.g. in proportion to their respective share of the market by type of equipment.	Collective Recycling System A "collective recycling system" is a recycling system organised by several producers working together to manage WEEE. A "collective recycling system" is not equal to "collective producer responsibility".

IPR, in accordance with Article 8.2, has been implemented for a limited number of product categories, in some EU Member States and elsewhere around the world, notably Japan some States in the USA, the Netherlands and South Korea. IPR could work alongside other regulatory and non-regulatory initiatives to ensure a true life cycle approach is taken.

Terms of reference:

The objectives of the Group are to:

1. Seek and obtain evidence (including relevant case studies) from a wide range of external stakeholders, including IPR experts about IPR systems and how they currently operate across the world.

2. Review the evidence (including any case studies) for IPR and consider how a system could work within the UK, to help meet Article 8.2 of the WEEE Directive.

3. Bring forward recommendations for how IPR could be practically, realistically and fairly implemented in the UK.

IPR Business Case

The business case for IPR must satisfy the following four imperatives which must be specific, measurable, achievable, realistic and tangible.

- Commercial Imperative
    - Does it make good business sense from a producer's perspective[17], for example; to generate competitive advantage and reward producers that invest in sustainable product design?
    - Does it provide an option for the better management of future compliance costs?
    - Does it quantify any potential for additional costs to be passed on to the consumer?
    - Does it provide an option for predicting/measuring WEEE arisings and thereby helping businesses plan the required infrastructure investments (encouraging UK market development and employment opportunities)?
    - Does it have the potential to stimulate more end market development?[18]

- Environmental Imperative:
    - Does IPR improve the environmental performance of the WEEE Directive?
    - Does IPR help the WEEE Directive to improve the life cycle performance of products[19]?
    - Does IPR help to increase the percentage of end-of-life products returned via and measured by the WEEE system for re-use, recycling and recovery?

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[17] Producers may also be SME's which will have a potential impact on IRP deliverability
[18] New products and/or services aligned with economic and social benefits
[19] Consider EU Raw Materials initiative
http://ec.europa.eu/enterprise/newsroom/cf/document.cfm?action=display&doc_id=894&userservice_id=1

- Political Imperative:
    - IPR must be capable of being delivered within a desirable policy and/or regulatory framework.
- Consumer Imperative:
    - Supports the development of a societal culture in which activities such as re-use and recycling are encouraged, to maximise resource efficiency.
    - Supports, through incentivising eco-design, increased availability of sustainable products.
    - Continues to support a collection infrastructure which is widely accessible and straight forward for consumers to understand and access.

Annex F: Approved Authorised Treatment Facility (AATF) – Operational Aspects

Visit summary: By Peter Calliafas.

We have already commented on the potential benefits of upstream approaches in respect of EEE placed on the market in so far as IPR approaches are concerned.

To enable us to understand the potential benefits of downstream approaches in respect of WEEE arising at an AATF, Viridor kindly hosted a visit to their St Helen's AATF[20].

The role of an AATF

An AATF is an authorised treatment facility (ATF) that is approved by the Environment Agencies[21] to issue evidence notes for the re-use, or treatment and recycling of WEEE.

The principal streams of WEEE that are handled and processed by this AATF, include:

- Cooling appliances (e.g. Fridges);
- Small Domestic Appliances (SDA) e.g. toasters, electrical toys;
- Cathode Ray Tubes (CRT) from TV's and Computer Monitors.

It is important to note that this demonstrates one example of how an AATF operates, there are many different formats for recovery of WEEE material streams.

Automated Processes:

There are two mechanical processing lines at the facility that are fully automated. The technology employed is MeWa. The controls are preset to handle and process a certain mix of WEEE materials at any given time although it is possible to change the settings/adjust process parameters if required. The plant works more effectively on a continuous basis as opposed to a batch basis.

[20] http://www.letsrecycle.com/news/latest-news/metals/viridor-opens-state-of-the-art-st-helens-weee-facility

[21] http://www.environment-agency.gov.uk/business/topics/waste/32084.aspx

These processing lines handle the following WEEE materials:

- Cooling appliances. Given the requirement to remove the refrigerant gases and related oils before further processing, all cooling appliances are handled in the same way because of the challenges and difficulties encountered in a) identifying brand type and b) distinguishing between cooling appliances containing CFC's and those containing pentane.
- Small Domestic Appliances. To ensure that the processing line operates efficiently, staff are employed in a picking line to remove items that present a risk to machinery, by way of examples, gas bottles and CRT's.

Manual Processes:

- Cathode Ray Tubes[22]. Processing CRTs requires a labour intensive process: firstly involving manual disassembly followed by the mechanical removal of the fluorescent coated section under controlled conditions. This is to prevent breakage and uncontrolled release of fluorescent coatings / leaded dust.

AATF – Commercial Considerations

An AATF is a relatively high fixed cost business. These fixed costs include business rates, headcount, capital employed and related financing costs (whether internal or 3rd party from the likes of a bank).

For these reasons, the return on capital employed and profit generation of the facility is predicated on achieving a) sufficient volume throughputs during the financial year and b) an appropriate margin contribution per tonne of input.

Product Categories and operational impacts

One of the key reasons behind the visit was to understand the impact of product innovation and design and the operational impacts that these give rise to.

A number of products were discussed and the practicalities seen at the St Helen's facility. These include:

[22] http://www.environment-agency.gov.uk/static/documents/Business/WEEE_treatment_external_flyer.pdf

1. Flat Screens: Flat screens in terms of model type can include a) plasma, b) LCD and more latterly c) LED. Flat screens that are LCD contain a mercury backlight which is hazardous under EWC categorisation. Because of this, the LCD flat screens have to be manually separated[23] and sent to a specialised treatment facility which can strip down the flat screen and recover the mercury backlight under sealed conditions.

2. Free standing oil filled electrical radiators: This is due to the oil content within the radiator which is, in itself, hazardous.

3. Scanners and photocopiers: Specifically, those containing a mercury backlight.

4. Smoke Detectors: Most common smoke detectors contain a small amount of americium-241. Although smoke detectors are not considered a risk to human health during use, smoke detectors do present a significant problem for an AATF given the radioactive content.

5. PV solar panels: Whilst not an immediate problem, these products will materialise in the waste stream in the short to medium term. In traditional PV solar panels, the two halves containing pure silicon crystal are coated with two different dopants (e.g. arsenic, gallium, aluminium, phosphorus).This will render them hazardous.

6. WEEE containing batteries: It is not possible to shred and process WEEE containing batteries given the risks that this presents. It is even more challenging when the batteries are sealed within the product itself (e.g. single use disposable cameras).As such, an additional intervention is required.

7. Product size: There is a trend to smaller and more compact EEE being placed on the market (e.g MP3 player, tablet computers etc. Smaller sized products need to be re-circulated through the plant several times before they are split open.

AATF – Return Share approach

The concept of a return share approach was discussed during the visit to the St Helen's facility. The principal sources of WEEE arisings handled at the facility are post consumer, collected and delivered from a number of Designated Collection Facilities (DCFs), managed under contract by one or by a number of different Producer Compliance Schemes (PCSs).

[23] Provided the back case to a flat screen is intact, this will state whether the flat screen is a plasma, LCD or LED type.

Note the facility has a commercial contract in place with a major producer whereby they will process their single branded WEEE products. These WEEE products consist of a) factory defects, b) warranty returns and c) WEEE arisings from their own take back arrangements.

It would be possible to separate out particular brands from a DCF bulk load arriving subject to the following factors:

1. That the brand can be identified. The product itself may have been damaged either at the DCF or in transit to the AATF.

2. Separation will be labour intensive as there are no equivalent mechanical processes that can accomplish this outcome in widespread use.

3. Cost implications. In normal circumstances, an AATF charges the PCS a gate fee of £x per y tonne of WEEE product category delivered. This gives rise to an individual unit cost of £z per unit in each tonne delivered. Under this arrangement, economies and efficiencies apply.

   If brand separation (rather than sampling) was required either by a producer or by a PCS, the cost of any labour involved in the brand separation will be additional. As a result, there will be an increase in the unit cost to the PCS for each tonne of WEEE product category delivered.

4. Cost allocation to a particular producer could be problematic given that a) the manufacturer of the product (the brand owner) might not be the same party who placed the product on the market (especially if bought by and then sold by a high street retailer).

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URN 12/1007