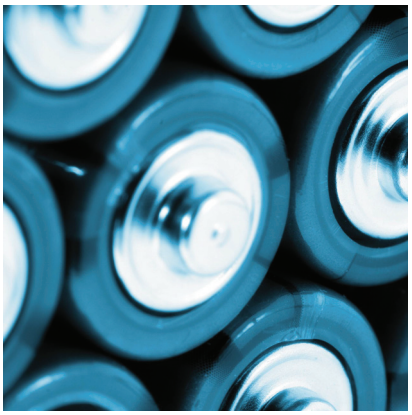
Comhshaol, Pobal agus Rialtas Áitiúil
Environment, Community and Local Government

Review of the Producer Responsibility Initiative Model in Ireland

Appendices

July 2014






RPS ESRI bio Intelligence Service PHILIP LEE SOLICITORS

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APPENDIX A: TERMS OF REFERENCE

A.1. WASTE STREAMS

As outlined in Section 1 above, DECLG proposes to appoint consultants to conduct a review of the Producer Responsibility model as identified in the Programme for Government.

The study should examine and report on, in relation to the specific waste streams that are subject to PRI: –

- The suitability and effectiveness of the current statutory and regulatory arrangements particularly when compared against best practice in other Member States,
- The effectiveness of the current competitive dynamic in the waste streams where PRI operates and how it can be maximised (i.e. existing schemes enhanced and/ or additional schemes made subject to PRI) to increase competition, lower costs for producers & lower the potential for free-riders, and also bearing in mind the potential increase in costs which might arise due to the increases in the number of compliance schemes,
- The costs of recycling for Irish producers, including both the actual costs of recycling and the administrative costs of the compliance scheme,
- The effectiveness of the current use of information and awareness within the PRI and recommendations for its enhancement,
- The suitability, availability and quality of waste recycling infrastructure and services, which are present in Ireland and relevant to PRIs including the practical potential for the use of emerging technologies.

We have set out below an outline of each of the different waste streams and the issues which require to be examined in the review by the successful tenderer.

A.2. WEEE

Introduction

Ireland's European Communities (Waste Electrical and Electronic Equipment) Regulations 2011, S.I. No. 355 of 2011 transpose the EU WEEE Directive 2002/96/EC into national legislation. There are two compliance schemes, WEEE

Ireland and ERP Ireland who are licensed to handle business to consumer waste while business to business producers self-comply. Producers must register with the WEEE Register Society, which is the national independent registration body, and report to the black box, on the amount of EEE they place onto the Irish market.

The WEEE Directive requires producers to be responsible for the financing of the collection, treatment, recovery and environmentally sound disposal of WEEE from 13 August 2005. It means that final users of such household WEEE are entitled to leave that waste back free of charge, either to retail outlets in instances where a replacement item is purchased, or other authorised collection points, including local authority civic amenity sites. Ireland has been very successful in implementing the WEEE Directive and our latest figures (2010) show that we have collected more than 8kg of WEEE per person which is almost double the EU target of 4kg.

Requirements

In our transposition of the WEEE Directive, Ireland introduced a regime of visible environmental management charges (vEMCs) which meant that an additional amount was displayed to the cost of electrical equipment to pay for the proper environmental treatment for the goods at their end-of-life. These costs applied solely to the end-of-life treatment of pre- August 2005 WEEE, (known as historic WEEE). The approved WEEE compliance schemes in Ireland currently hold a level of reserves which is set against the future treatment needs of historic WEEE. We require a thorough and robust examination, in conjunction with all stakeholders, of the exact amount of funding that is required to be held to discharge the responsibilities for the remaining amounts of historic WEEE.

If this examination concludes that, after discharging the requirements for all outstanding end-of-life treatment of historic WEEE, a surplus of funds still remains, then recommendations shall be provided on how to utilise the remaining funds in a way which is in line with the legislative requirements and is reflective and supportive of this Department's environmental policies and the Waste Framework Directive.

Ireland's two compliance schemes for WEEE (WEEE Ireland and ERP Ireland) currently operate under an approval from DECLG. Certain inter-scheme balancing arrangements also operate pursuant to a voluntary agreement. Any barriers to transfer of producers between the compliance schemes should be identified.

Recommendations shall be provided for a regime whereby producers can readily switch between the two compliance schemes without losing rights or entitlements. This switching regime should be simple, straight forward and administratively easy for the producers. It should also involve an arrangement as to how producers can bring the funds that they paid for historic WEEE with them as well as analysis of the historic movements of producers between the schemes and the effect of the non-transfer of funds will be required to fund such considerations.

In late 2010 and throughout 2011, as a consequence of the overall problem of metal theft across Europe, we have seen increasing misappropriation of WEEE, whereby quantities of WEEE flow outside legal channels, commonly known as "WEEE leakage". This has become a serious problem and we need further recommendations as to how we combat this leakage and retain the flow of WEEE within the legal channels. These recommendations would have the dual aims of (i) contributing to Ireland meeting the targets which will be contained in the newly recast EU WEEE Directive and (ii) ensuring that WEEE is diverted to channels which will ensure its proper end-of-life treatment while ensuring that legitimate operators are not put at a competitive disadvantage.

Since the implementation of the WEEE Directive in Ireland, we have maintained a regime of vEMCs or visible costs. This regime of visible costs expires in early 2013 but Member States, under the recast WEEE Directive may continue to show environmental costs. We need an examination of the benefits and disadvantages of retaining such a structure in the future, e.g. what is the perception of consumers of these fees and do they play an important part in terms of awareness-raising for consumers?

We also require recommendations as to how to boost the collection rates for WEEE in Ireland. The study should examine examples of best practice of WEEE collection in Europe and see if there are systems which could be adopted for use here. In examining best practice models, we should also examine what specific measures can be taken to incentivise the various participants in the WEEE collection chain in order that we can maximise the collection of WEEE. We also require an analysis of the options in the recast WEEE Directive for Ireland in regard to the WEEE placed on the market approach versus the WEEE Generated approach.

Advice should be provided on a reuse protocol and how an ongoing scheme of reuse and preparing for reuse can be implemented for the WEEE waste stream having regard to the legislative requirements, e.g. should reuse be led by separate dedicated compliance scheme(s) or through the existing WEEE compliance schemes? Also, how can the concept of reuse be best communicated to the general public and endeavours of existing reuse organisations and commercial companies be most appropriately integrated into the reuse system. Finally, as part of this reuse system, we need to develop a methodology which allows the Environmental Protection Agency (EPA) to capture the data on WEEE prepared for reuse which is necessary for statistical returns to the European Commission.

In common with certain other waste streams where the position regarding the compliance schemes and their inter-relationship has evolved through a network of producer responsibility agreements, it is now necessary to review these structures to see if there is a need for further enhancement in order to cater for the emerging regulatory regime. In particular the operation of the existing producer responsibility agreements should be reviewed, the possible introduction of further schemes examined and recommendations should be provided (in line with Section 2.10.4) for a more robust inter-scheme framework. The geographical split that exists currently between the two schemes in this area needs to be examined in terms of its effectiveness and impact on competition between the compliance schemes.

A.3. BATTERIES

Introduction

Ireland's Waste Management (Batteries and Accumulators) Regulations, S.I No. 268 of 2008 fully transposes the EU Directive 2006/66/EC on waste batteries into national legislation. These regulations provide for the free take back of all portable waste batteries and accumulators, otherwise known as rechargeable batteries, in-store and at designated locations. The Directive facilitates the effective environmental management of waste batteries and accumulators.

The domestic arrangements for batteries mirror those for WEEE where two compliance schemes, WEEE Ireland and ERP Ireland are licensed to recover and recycle batteries. Producers must register with the WEEE Register Society, which is the national independent registration body, and report to the black box, on the

amount of batteries they place onto the Irish market. Ireland has recently exceeded the interim EU target of 25% for battery recycling by September 2012 with a recycling rate of over 29% achieved at end 2011.

Requirements

Ireland has met the 2012 EU battery collection recycling target of 25%. We need further advice on initiatives that might be taken to raise the battery collection recycling rate to meet future targets, as a more onerous EU battery collection target of 45% is applicable in 2016. As with WEEE, recommendations are also required regarding the inter-relationship between the schemes operating in this area, i.e. what is the most competitive structure that the Department can put in place to ensure that maximum efficiencies of operation are achieved, that members can transfer easily between schemes and that self-compliers contribute effectively to achievement of targets. The geographical split that exists currently between the two schemes in this area needs to be examined in terms of its effectiveness and competitiveness.

The study should examine examples of best practice of battery collection in Europe and see if there are systems which could be adopted for use here. In examining possible measures, consideration should also be given to the possible rebranding of national battery collection measures under one umbrella brand.

A.4. PACKAGING

Introduction

The regulatory regime governing packaging waste has been in place in Ireland since 1 July 1997 although the original regulations have been revised and replaced on two substantive occasions (primarily due to the imposition of higher recovery/recycling targets), both in 2003 and more latterly in 2007. The 2007 Regulations, S.I. No. 798 of 2007 provide the necessary legal framework to facilitate the recovery and recycling of packaging waste in Ireland.

Under the regulations, obligations are imposed on the suppliers of packaged goods, packaging material or packaging e.g. shops, pubs, supermarkets, wholesalers, manufacturers, importers, exporters and other suppliers - all such suppliers are referred to as “producers” of packaging. All producers must segregate the packaging

waste arising on their own premises into specified waste streams (i.e. waste aluminium, fibreboard, glass, paper, plastic sheeting, steel and wood) and have it collected by authorised operators for recycling. In tandem with the above requirements, the landfill of such materials from commercial sources is prohibited. Producers are also obliged to provide information, within a reasonable period of time, to other producer customers in relation to the weight of packaging they have supplied and use only authorised recovery operators for the collection and recovery of packaging waste.

Additional obligations are imposed on producers who exceed specific de minimis criteria (i.e. meet both a turnover threshold and a tonnage threshold) and whom are subsequently referred to as "major producers". A major producer is a producer whose turnover is greater than €1 million (excluding trade discounts and VAT) and who supplies 10 tonnes or more of packaging material or packaging to the Irish market. Major producers have responsibilities for the recovery of packaging waste from their customers (including the provision of segregated receptacles on their premises for the acceptance of packaging waste), meeting prescribed targets, on-site signage, public advertising, data reporting and registration with local authorities.

Major producers have the option of either complying directly with their producer responsibility obligations (i.e. self-compliance), or alternatively, getting an exemption from those requirements by becoming a member of a packaging waste compliance scheme. Part IV of the regulations provides for the establishment of "approved bodies" and sets out the requirements for an application to the Minister in this regard. Subject to the provisions of Part IV of the regulations, any person or body corporate may apply for approval to operate as an "approved body" for the recovery of packaging waste. Currently Repak Limited is the sole approved compliance scheme for the recovery of packaging waste in Ireland and, in 2010, it achieved a packaging waste recovery rate of 74%, which is significantly in excess of the EU Directive requirement of 60%.

Requirements

At present, there is one approved packaging compliance scheme. Again, in common with certain other waste streams, advice is required as to how:

- The impact of the introduction of one or more other compliance schemes in this area, in view of the potential benefits of competition,

- The approval of a second or more schemes would operate in practice,
- Changes might be necessary to the regulatory regime to optimise arrangements in this regard,
- Tthe continued achievement of targets would be ensured should the analysis support the introduction of other schemes in this area, details should be provided in terms of target achievement, market breakdown and the avoidance of replication on information and awareness.

This regulatory regime should also have an emphasis on co-operation between the schemes.

The Programme for Government contains a commitment to explore a packaging levy and this Department has recently completed a consultation process with stakeholders on that issue. In connection with this possible levy, the Department is now seeking the following, (i) an economic analysis of the possible effects of a packaging levy, (ii) options on how a possible packaging levy might operate, (iii) possible alternatives to a packaging levy which would yield corresponding reductions in packaging (iv) how might a packaging levy work in tandem and affect the operation of the compliance schemes and (v) an examination of initiatives such as deposit and refund and reverse vending both as stand-alone options or in tandem with a packaging levy. .

The current Packaging Regulations should be reviewed and, in particular, the issue of self -compliance and the de minimis rule shall be examined. Currently, under the Packaging Regulations, producers are allowed to fulfil their obligations by self-complying. We require a full examination of all the considerations and practical issues underpinning the principle of self-compliance. The study should assess whether the practice of self-compliance is ensuring an equivalent level of fulfilment of a producer's environmental obligations at comparable cost to that of participation in a compliance scheme. The economic and environmental implications of altering the de minimis rule should also be assessed.

A.5. FARM PLASTICS

Introduction

The Waste Management (Farm Plastics) Regulations, 2001, S.I. No. 341 of 2001 are designed to promote the recovery and collection of farm plastics waste (silage wrap and sheeting). The Regulations require a producer of farm plastics (manufacturers and/or importer) to either:

- Become directly involved in the recovery of farm plastics waste from customers through offering a deposit and refund scheme

Or

- Participate in a government approved recycling scheme.

The Irish Farm Films Producers Group (IFFPG) was established in 1997 and comprises membership of film manufacturers, importers and suppliers. It is a not-for-profit organisation and is at present the sole approved body in Ireland for the purposes of operating a compliance scheme for the recovery of farm plastics. Under the terms of its approval, IFFPG is required to meet specified targets for the recovery of farm plastics. The current target set for IFFPG is to recover 60% of all farm plastics placed on the market by its members in 2012 and in 2010 they have achieved this target.

Requirements

Currently there is only one compliance scheme approved for farm plastics. Recommendations shall be provided on whether it is possible or feasible, from an economic perspective, to have multiple schemes approved for this waste stream. Recommendations are also required on how to combat illegal imports and exports of farm plastics, in particular those from Northern Ireland.

In line with Programme for Government objectives, we require an analysis of the feasibility of incorporating other types of farm plastics materials and other agri-wastes into a possible PRI. The study should analyse whether there is still a need for the levy which operates in the farm plastics PRI.

A.6. END-OF-LIFE VEHICLES

Introduction

The Waste Management (End of Life Vehicles) Regulations 2006, S.I. No. 282 of 2006, fully transpose Directive 2000/53/EC. Under these regulations, each vehicle manufacturer or importer is required to have a national collection system in place made up of at least one such treatment facility in every local authority area.

These facilities provide a free take-back service for vehicles of that producer's brand. An authorised treatment facility that forms part of a producer's network is bound to accept any specified vehicle of that producer's brand. If essential parts of the vehicle (e.g. engine, gearbox, transmission and catalytic converter) are missing, or the vehicle contains waste, then a charge may apply. An operator of an authorised end-of-life vehicle treatment facility (ATF) is obliged to:

- Issue the registered owner with a certificate of destruction;
- Ensure the facility is operated under an appropriate waste licence or permit;
- Meet the minimum technical requirements for the storage, treatment and recovery of end-of-life vehicles and the storage of components containing fluids, spare parts, etc;
- Keep records of end-of-life vehicle materials for reuse, recycling, recovery and disposal and report these records to local authorities annually;
- Forward the details of the certificate of destruction to the National Vehicle and
- Driver File, maintained by the Department of Transport;
- The vehicle must be treated within 10 days of being deposited at the facility.

The treatment of end-of-life vehicles at dedicated treatment centres, designed to dismantle vehicles in accordance with environmental best practice, allows hazardous substances to be removed and segregated from the main vehicle metal mass. Thus there is a welcome reduction in the volumes of hazardous waste that would have been previously generated by the shredding of whole vehicles without any pre-treatment. Such a practice resulted in the contamination of non-hazardous

components with hazardous components, leading to greater overall volumes of hazardous waste.

By virtue of the above, the end-of-life vehicles regulations have resulted in hazardous waste prevention and minimisation. It should also be noted that the EU Directive 2000/53/EC places obligations on producers of vehicles to ensure that certain hazardous substances are not used.

Requirements

One of the principal areas of concern in this review is the area of end-of-life vehicles. This waste stream operates pursuant to EU Directive 2000/53/EC which obliges Ireland to meet certain targets for the recovery and recycling of vehicles at their end–of-life. To date, Ireland has not been able to meet the targets set out in this Directive in respect of the recovery and recycling of ELVs and immediate steps must be taken to address this serious breach of EU environmental requirements. By 2015, more stringent EU targets will come into force for the recycling/recovery of ELVs.

An examination of all aspects of the end-of-life vehicle system currently in operation is necessary and recommendations are required on how to improve the structure and environmental outputs of the end-of-life vehicle system. The study should examine examples of best practice for managing the end-of-life vehicle process in other Member States. Recommendations shall be provided for systems, including funding & reporting systems, which could be adopted for use here. As part of these recommendations, we require an analysis of the most beneficial uses for auto shredder residue.

A recommendation is also required as to whether a system of arrangements could be put in place that would benefit from the establishment by the producers (motor vehicle manufacturers) of a compliance scheme which would have responsibility for the oversight of the system and meeting the EU targets. Details regarding the regulatory regime, data collection, the option of self-compliance, information and awareness, and other relevant issues should also be provided.

A.7. TYRES

Introduction

The Waste Management (Tyres and Waste Tyres) Regulations 2007, S.I. No. 664 of 2007 were introduced to tackle the inadequacy of information on tyre flows and the management of waste tyres and put in place an improved regulatory framework. The Regulations facilitate the comparison of quantities of waste tyres arising with the amounts placed on the market and tracking the movement of waste tyres from the time they are discarded until they are either reused or processed for recycling. The Regulations impose obligations on persons who supply tyres to the Irish market (producers and suppliers) and waste tyre collectors to submit quarterly reports on tyre flows to either their local authority or the compliance scheme they are participating in.

There are two approved collective compliance schemes; Tyre Recovery Activity Compliance Scheme (TRACS) and Tyre Waste Management (TWM) which were approved by the Minister for the Environment in 2007 (TRACS) and 2009 (TWM). Both are not-for-profit bodies.

Requirements

The PRI bodies approved by this Department for waste tyres have an objective to ensure the proper management of all waste tyres by tracking tyre and waste tyre flows. There is no commitment to meet specified targets nor do they arrange for the collection and recovery of tyres. The structural and environmental effectiveness of all aspects of the current system needs to be reviewed to assess whether this system is ensuring the appropriate environmental management of waste tyres.

A fundamental review is required of all aspects of the current system and recommendations should be provided which are designed to urgently improve its operation and ensure that waste tyres are managed according to best environmental practice. Recommendations on how to manage the movement of tyres and waste tyres across the border to/from Northern Ireland in order to ensure that waste is properly managed and that data is accurately recorded are also required. Recommendations for future changes in this area, including consideration of the establishment of a system of arrangements in accordance with international best

practice, should be supported by details setting out the necessary regulatory regime, operational requirements, self-compliance issues, information and awareness requirements and other relevant issues and should take account of the recently commenced North South study on Waste Tyres.

A.8. CONSTRUCTION AND DEMOLITION

Introduction

A voluntary scheme operates in this sector by way of an industry led initiative. The National Construction Demolition Waste Council was established in 2002 with the objective of providing a framework to meet the policy and targets set out by the Government in the policy document *Changing Our Ways* and other such policies as may be set from time to time. At the time five sub-committees (Infrastructure and Facilities, Markets for Recycled Materials and Specifications, Project Best Practice and Waste Management, Review of Regulatory Framework, Information, Public Awareness and Funding) were established to assist with the key objectives.

The Council played a key role in raising the awareness of this waste stream and in improving the management and recycling of such waste. A website was developed and contains a number of very useful documents.

Requirements

The Programme for Government contains a commitment to examine the establishment of producer responsibility for construction and demolition projects over a certain threshold. In addition, it also requires that these arrangements would be reinforced through compliance bonds. We require recommendations regarding the categories of waste material that ought to be included and the manner in which a producer responsibility system could operate successfully within the construction and demolition waste sector. We also require an analysis of how a system of compliance bonds could operate successfully. Recommendations for future changes in this area should be supported by details setting out the necessary regulatory regime, operational requirements, self-compliance issues, information and awareness requirements and other relevant issues.

A.9. EMERGING ALTERNATIVE TECHNOLOGIES AND NEW APPROACHES

This review should generally consider, as part of the context for the review, the use of all new or emerging alternative technologies, which could potentially be employed:

- To support the recovery of PRI waste from the municipal waste stream,
- To contribute towards the reduction of Waste within the PRI Initiative,
- To increase the recovery rate for PRI waste generally.
- To ensure the environmentally sound treatment and management of residual waste and hazardous waste in the PRI waste streams, and

The Review should also consider-

- Further measures to enhance the prevention and minimisation of PRI waste and to encourage the preparation for reuse of recovered PRI waste resources;
- Further measures which could be undertaken to support the development of indigenous reprocessing capacity for PRI waste;
- Potential new PRI waste/resource management processes / business models;
- The desirability of further producer responsibility schemes;
- Measures to promote potential new technologies and techniques;
- Potential regulation and legislation, including:
    - Producer Responsibility/Product Stewardship,
    - Extended Producer Responsibility including measures required for implementation,
    - Green public procurement or similar measures to promote stable markets and demand for reusable and recycled products and associated services,
    - Mandatory annual reporting on resource use and waste production;

A.10.COMPLIANCE SCHEMES

Introduction

As set out in Section 1 above, there are a number of issues which are impacting on the environment in which the Producer Responsibility Initiative model in Ireland operates. One of the cornerstones of this initiative in Ireland has been the introduction of compliance schemes. These schemes, which have been established by producers to process end-of -life environmental obligations, currently operate in a number of waste streams in Ireland. The Department recognises that a fundamental review of the operation of the compliance schemes in Ireland is an integral part of this overall review. Accordingly, in addition to the specific issues identified in sections 2.1 – 2.9, we require a more general examination of these schemes across a number of headings set out below.

Competition

A central focus of the current Programme for Government is to create jobs and improve the competitive environment for business in Ireland. Accordingly, there is a need to ensure that the optimal competitive environment is provided for compliances schemes. Therefore, an examination across all of the waste streams is required as to whether the current arrangements are inhibiting competition and if so, recommendations should be provided as to how this situation can be improved. In terms of ensuring competition among compliance schemes, and in particular lowest compliance costs for businesses consistent with the achievement of the environmental outcomes required, recommendations are also required on the optimum numbers of compliance schemes that could maximise operational efficiencies in each waste stream.

In analysing the overall nature of the competitive aspects of the market for compliance schemes, it will be necessary, as set out above, to review the existing geographic division for the collection of WEEE and batteries and to suggest possible new ways to open up the market to multiple compliance schemes operating within a given waste stream.

Given the overall national imperative to improve competitiveness, a benchmarking of the costs incurred by producers in Ireland is required against those of other

European Member States in respect of the individual waste streams which are subject to producer responsibility. This benchmarking exercise should also include a breakdown and analysis of the cost base of Irish compliance schemes against their European counterparts plus an analysis of the costs incurred for the actual recycling of the waste.

Corporate Governance

It is recognised that the compliance schemes which operate in Ireland are unusual in that they operate in commercial markets but are not-for-profit organisations. While this might be a unique model within the EU, we require these compliance schemes to operate to the highest standards of corporate governance. In recommending a code of corporate governance, best national and international practice should be examined, both in terms of the organisations themselves and their relationship with DECLG e.g. should service level agreements or contracts be put in place to manage the performance of these schemes; what sanctions should be considered for under-performance? In the final analysis, it is proposed that the level of responsibility resting with producers will be examined, as will mechanisms for applying appropriate financial penalties, where it has been clearly demonstrated that a scheme has breached any of the conditions of its approval, including failure to meet agreed performance targets.

Interrelationship between Compliance Schemes

The Department has seen an increasing level of enquiries by companies who wish to seek to operate as compliance schemes. Given this trend, where we might have multiple compliance schemes operating in various waste streams in the future, it is essential to examine the appropriate levels of cooperation which need to exist between schemes in various areas. Should specific requirements be inserted into a compliance schemes approval, for example, which would oblige the compliance scheme, to actively communicate and co-operate with other approved bodies on issues? The intention here, by using increased and enhanced co-operation, is to avoid duplication, reduce costs and explore synergies between schemes.

Also, given the possibility of multiple schemes, recommendations should be provided around a dispute resolution mechanism which could be used for settling disputes between compliance schemes. The aim of the dispute resolution protocol should be to settle any disputes at the lowest possible level between the organisations.

Information and Awareness

One specific area which we require analysis of is the area of information and awareness. All of the compliance schemes operate information and awareness campaigns. These campaigns range from large-scale, national mainstream media campaigns to smaller, local or regional campaigns. We need an analysis of how much is spent by the compliance schemes on these activities and how successful they are in mobilising actual increased prevention, reuse and recycling behaviour. As we move to possibly more compliance schemes we also need an analysis and examination of whether it is more efficient and effective to remain with schemes devising and running individual information and awareness campaigns or whether another approach could produce better results and be more cost-effective, e.g. could a separate entity assume responsibility for this and levy the schemes with the costs involved?

The issue of the contribution of self-compliers to information provision and awareness-raising should be examined; currently self-compliers are not required to contribute to this activity.

This Department wishes to get an overall view of the sources from which Irish people get their recycling messages. We need to examine which media types and campaigns have the most effect on the recycling behaviour. Also, as domestic and European waste recycling targets increase and it becomes increasingly difficult to achieve targets, we need to ensure that our recycling messages are reaching all socio economic classes and we need specific recommendations to support this.

Given the huge expansion of social networking and the fact that social networking now accounts for 1 in every 6 minutes spent online, we need to have an analysis of the social networking plans of the compliance schemes. We also need further recommendations as to how we can utilise this medium to increase awareness of recycling in the future. We also require an analysis of whether new entrant

compliance schemes can easily access existing information and awareness activities.

Approval Conditions

We require an examination of the terms and conditions of the approvals which are currently granted to compliance schemes. In examining the approvals, we also need to ensure that a proportionate amount of the administrative burden is carried by the compliance scheme and not solely by the Department and its agencies.

Other areas where we require specific examination and recommendations involve the possibility of introducing fees for an approval to operate as a compliance scheme.

Contingency Funding

One of the current approval conditions of the compliance schemes requires that funding equivalent to approximately one year's operational costs is held as a reserve. This contingency would then be set against recycling costs if the scheme was to cease operating. We need to examine this figure to see if it is appropriate that schemes hold this amount of contingency reserves and if a greater use of risk management techniques within the corporate governance framework could negate the need for this level of contingency reserve.

Easing Administrative Burdens

This Department is conscious that we must continue to reduce the administrative burdens which we place on producers and firms generally. Also, under both EU and domestic initiatives, we are required to reduce administrative burdens and we require recommendations in the areas of data gathering, reporting, monitoring and enforcement that will achieve this.

Self-compliance

In all of the PRI areas, producers must have the option of either self-complying with their environmental obligations or participating satisfactorily in an approved scheme which will fulfil their obligations for them. As already identified above, a number of issues concerned with self-compliance need to be examined: contribution to target

achievement; contribution to awareness-raising; and equity between the obligations for self-compliers and scheme members. This research should also examine the general effectiveness, in terms of environmental protection, of self-compliance and the relative costs versus scheme membership costs.

Depending on the particular PRI, self-compliers are required to register with their local authority or EPA and pay an appropriate fee; the local authority or EPA as appropriate is responsible for the enforcement of the self-compliance mechanism. We require an analysis of the effectiveness of this structure in terms of meeting Ireland's environmental obligations, with recommendations for any structural improvements, cost adjustments or additional self-complier requirements.

Possible New Areas for PRI Schemes

This review should also help identify, with the necessary consultation with all stakeholders, what other waste streams might be suitable for the development of further PRIs or voluntary agreement regarding the handling of end of life waste. In examining such other possible waste streams, the Review should have regard to the recommendations of the National Hazardous Waste Management Plan, which considered a number of waste streams to be suitable for further evaluation as possible producer responsibility initiatives.

In particular, the position of newspapers, magazines and farm plastic chemical containers should be examined and assessed as to whether there would be environmental and economic benefits to the development of a possible PRI.

WEEE Register Society

The WEEE Register Society (WRS) is the body which registers producers for WEEE and Batteries compliance in Ireland and it oversees the maintenance of the independent black box. We need to examine the costs of this operation and the fees charged to producers for registration and examine this against similar operations in other EU countries. Also, arising from the examination of the structural arrangements in other waste streams, we need to assess whether any additional black box or other responsibilities might be assigned to the WEEE Register Society. We also require an examination of the integrity of the data placed in the black box.

An examination is also required of other possible responsibilities which might be assigned to the WEEE Register Society given the recast of the WEEE Directive and other possible developments in other waste streams. Given the expertise and experience of the WEEE Register Society, and in the context of the ongoing drive for public service efficiency, consideration should be given to whether there is scope and capacity to assign other responsibilities for maintaining other non-waste related national registers to the WRS.

Possibility for Enhanced Co-operation with Northern Ireland

The Department has a very good working relationship with our counterparts in Northern Ireland, working constructively both through the existing structures in the North South Ministerial Council (NSMC) and on a bilateral basis on issues outside the NSMC framework. We would welcome recommendations on how to increase environmental protection across the PRI area through even greater cooperation, particularly in the area of enforcement.

Enforcement

A key part of the producer responsibility regime is the issue of enforcement. We require an analysis of the effectiveness of our enforcement arrangements through an evaluation of local authority Recommendation of Minimum Criteria for Environmental Inspections (RMCEI) plans and recommendations as to how enforcement measures can be simplified and improved. Full regard should be had to all aspects of the emerging national waste policy.

Public and Stakeholder Consultation

Given the wide ranging nature of this review, DECLG intends to invite comments from the general public, local authorities, environmental non-governmental agencies and from other stakeholders. The successful tenderer will be required to analyse any comments received and conduct a range of meetings with key stakeholders.

APPENDIX B: CONSULTATION WORKING PAPER

Mr. Phil Hogan, T.D., Minister for the Environment, Community and Local Government announced the commencement of a review and public consultation of the Producer Responsibility Initiative (PRI) model in Ireland.

Invitations for written submissions on the review of the Producer Responsibility Initiative model in Ireland was announced by Mr. Phil Hogan, T.D., Minister for the Environment, Community and Local Government on 29th June 2012.

The public consultation phase remained opened until Wednesday 25th July 2012 and a consultation document was made available at www.environ.ie/en/Environment/.../FileDownLoad,30640,en.doc

Submissions on the review of the producer responsibility initiative model were received from 39 stakeholders. Those stakeholders that made a submission are listed below:

1. Alcohol Beverage Federation of Ireland (ABFI)
2. Beverage Council of Ireland (BCI)
3. Boylan Engineering
4. CareTakeBack.com Ltd.
5. Cavan County Council
6. Chartered Institution of Wastes Management (CIWM)
7. Connacht Waste Management Regional Office (2)
8. Crumb Rubber
9. Cynar
10. Dublin City Council
11. Electrical Industry Federation of Ireland (EIFI)
12. Electrical Retailers Group of Retails Excellence Ireland
13. Environmental Protection Agency (EPA)
14. ERP Ireland
21. Irish Fertilisers Marketing Association (IFMA)
22. INCPEN
23. Irish Farm Film Producers Group Ltd. (IFFPG)
24. Irish Tyre Industry Association (ITIA)
25. Irish Waste Management Association (IWMA)
26. Kenny Distributors Europe
27. Kerry Farm Relief Services
28. Leaf Environmental Ltd.
29. Limerick/Clare/Kerry Regional Waste Management Office
30. Plastics Ireland
31. Rehab Group
32. Robert Murphy
33. Society of the Irish Motor Industry (SIMI)
34. The Hammond Lane Metal

15. Filmco Ltd.
16. Food and Drink Industry Ireland (FDII)
17. Green Press Partnership (GPP)
18. IBEC
19. Irish Farmers' Association (IFA)
20. Irish Engineering Enterprises Federation (IEEF)
Company Ltd.
35. TRACS
36. Tyre Recovery Association Ltd. UK
37. Voice of Irish Concern for the Environment
38. WEEE Ireland
39. Wilton Waste Recycling

Meetings and conference calls also took place with 47 stakeholders. These stakeholders are as follows:

1. Camara
2. County and City Management Association (CCMA) (2)
3. Cement Manufacturing Industry
4. Construction Industry Federation (CIF)
5. Chartered Institution of Wastes Management (CIWM)
6. University College Cork
7. Crumb Rubber
8. Cynar
9. Department of Transport, Tourism And Sport (DTTAS)
10. Dixons
11. Department of the Environment Northern Ireland (conference call)
12. Electrical Industry Federation of Ireland (EIFI)
13. EPA NIECE (phone call)
14. EPA farm plastics
15. EPA National Waste Report Unit
16. EPA OEE Cork
17. EPA PRI Unit
18. ERP
24. IBEC ICT Ireland
25. IBEC White Goods Association
26. Irish Farmers' Association (IFA)
27. Irish Farm Film Producers Group Ltd. (IFFPG)
28. Irish Fertilisers Marketing Association (IFMA)
29. IKEA
30. Irish Motor Vehicle Recyclers Association (IMVRA)
31. Irish Tyre Industry Association (ITIA)
32. KMK Metals Recycling Ltd.
33. Leaf
34. Murphy Electrical
35. Green Press Partnership (GPP)
36. Philips & Recolights (2)
37. Regional Waste Coordinators
38. Rehab
39. Repak
40. Retail Excellence Ireland
41. The Society of the Irish Motor Industry (SIMI) (2)
42. Thorntons Recycling

19. Greenstreets
20. Hammond Lane
21. IBEC
22. IBEC Environmental Committee
23. IBEC Consumer Electronic Distributors Association
43. TRACS
44. Trevor Radcliffe
45. Tyre Waste Management
46. WEEE Ireland
47. WEEE Register Society

APPENDIX C: WORKING PAPER ON EUROPEAN PRODUCER RESPONSIBILITY SCHEMES

Review of the Producer Responsibility Initiative model in Ireland

Working paper on European PRIs

Department of the Environment, Community and Local Government
25 June 2014

bio Intelligence Service

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Chapter 1: Overview

This chapter provides an overview of Producer Responsibility Initiatives (PRIs) in Member States other than Ireland, based mainly on information from the websites and reports of producer responsibility organisations (PROs), national ministries and waste agencies, and national and European associations (e.g. PRO Europe). We list waste streams for which PRIs exist in other Member States but not yet in Ireland (medicines, waste oils, etc.) but we focus in more detail on the PRIs that are applied in Ireland, which are:

- Packaging;
- Waste Electrical and Electronic Equipment (WEEE);
- End-of-Life vehicles (ELVs);
- Batteries;
- Tyres;
- Construction and demolition (C&D);
- Farm plastics.

In the next chapter, we will screen these PRIs based on evidence of successful performance (in terms of shares collected, recycled and recovered) compared with costs.

1.1 Introduction

Producer responsibility stems from the polluter-pays principle, a pillar of EU environmental policy, and works by making those placing products on the market responsible for the impacts of those products. The principal aims are to relieve local authorities of some or all of the cost of managing waste, and transfer that cost from taxpayers to consumers, and to internalise the cost of end-of-life management of a product and incentivise manufacturers to adopt an ecodesign approach. Products covered by PRIs tend to be those that pose problems for recycling or recovery and which generate high management costs for various reasons: quantities (packaging), hazards (chemicals), health risks (medical waste), cost of recovery (tyres), complexity (WEEE) or wide dispersion (batteries).[1]

There is considerable variation among Member States with regards to how they execute producer responsibility:

- Schemes may be collectively funded via PROs (e.g. Eco-Emballages in France) or they may be individualised systems as in the case of WEEE in Germany;
- Most PRIs are established in the framework of national or European regulations but there are some cases of voluntary measures adopted by producers;

[1] ADEME (2012) *Extended Producer Responsibility in France: Panorama*, 2011 Edition.

- Some PRIs handle only domestic products, some only products for professional use, and some cover both;
- Fees may cover 100% of waste management costs or only part;
- There may be several competing PRIs, which can reduce costs, or only one, which can enable more coherent and efficient collection;
- The licensing award process for PROs and the level of stakeholder consultation varies among Member States;
- License durations vary, from one year in the UK to indeterminate length in the case of packaging in Germany, with other countries in between, such as France with durations of around five years;[2] longer durations can help promote better visibility and public awareness but may have a cost in terms of competition for the market.

Waste management performance targets are in place for various waste streams as a result of EU waste legislation (notably the Packaging, WEEE, ELV and Batteries Directives). However, implementation has been challenging in some countries for various reasons:

- Waste disposal arrangements vary significantly across Member States. Many of these arrangements existed before the various Directives and thus were not designed to meet their requirements;
- Directives may seek to make producers responsible for the cost of taking back not only those products yet to be put on the market but also those already on the market. For example, car manufacturers were strongly opposed to being made responsible for vehicles already on the market under the ELV Directive;
- The requirements of the Directives may increase the cost of waste disposal;
- Administrative arrangements may be burdensome in a number of respects, e.g. requiring the establishment of national systems or standards, whereas waste management is often the responsibility of regions in federal countries, or of municipal authorities in others, which creates overlapping competencies;
- The administrative resources necessary to implement complex Directives effectively can be lacking.[3]

The European Commission's report on the Thematic Strategy on waste prevention and recycling recommends that "the introduction of instruments used by well performing Member States should be strongly encouraged particularly in worse performing Member States. Optimal combination of economic and legal instruments should be promoted notably through landfill bans and by applying the producer responsibility concept to additional waste streams on the

[2] FNADE (2011) Presentation to Congrès, 23 June 2011, accessed at www.fnade.org/sites/fnade/-upload-/2010_130826_20110624161351.pdf.
[3] Ecologic (2007) *End of Life Vehicles (ELV) Directive: An assessment of the current state of implementation by Member States*, http://ecologic.eu/download/projekte/800-849/849/FC_3/SC_2_Study_ELV_Directive_March_2007.pdf.

basis of a common European approach".[4] Table 1 gives an overview of the coverage in other Member States of the waste streams in place in Ireland, while Table 2 provides total amounts of waste generated by stream and country.

Table 1: PRIs for waste streams covered in Ireland by Member State[5]

	Packaging	WEEE	ELVs	Batteries	Tyres	C&D	Farm plastics	Total
AT	•	•	•	•	•	•	?	6
BE	•	•	•	•	•	-	•	6
BG	•	•	•	?	•	-	-	4
CY	•	•	•	•	•	-	-	5
CZ	•	•	•	•	•	-	-	5
DK	•	•	•	•	•	-	-	5
EE	•	?	•	•	•	-	-	4
FI	•	•	•	•	•	-	-	5
FR	•	•	•	•	•	-	•	6
DE	•	•	•	•	-	•	•	6
EL	•	•	•	•	•	-	-	5
HU	•	•	?	?	•	-	-	3
IT	•	•	•	•	•	-	-	5
LV	•	•	•	•	•	-	-	5
LT	•	•	•	•	•	-	-	5
LU	•	•	•	•	-	-	-	4
MT	•	•	•	•	-	•	-	5
NL	•	•	•	•	•	-	•	6
PL	•	•	•	•	-	-	-	4
PT	•	•	•	•	•	-	-	5
RO	•	•	?	?	-	-	-	2
SK	•	•	•	•	•	-	-	5
SI	•	•	?	•	•	-	-	4
ES	•	•	•	•	•	•	?	6
SE	•	•	•	•	-	-	?	4
UK	•	•	•	•	-	•	-	5
Total	27	26	24	24	21	6	5	133

[4] European Commission (2011) *Report on the Thematic Strategy on the Prevention and Recycling of Waste*.
[5] Based on IEEP, BIO et al. (2012) *Use of economic instruments and waste management performance*, DG Environment.

The size of the market for each waste stream by country is shown in the table below.

Table 2: Total domestic waste generated by stream and Member State (kt)[6]

	Packaging (2009)	WEEE (2008)	ELVs (2009)	Batteries (2008)	Tyres (2010)	C&D* (2008)	Farm plastics* (2008)
AT	1 164	172	74	16	60	31 390	641
BE	1 642	295	145	53	82	15 442	1 075
BG	303	4	63	1	20	1 829	73
CY	80	18	15	2	1	431	68
CZ	894	209	147	7	57	10 651	232
DK	694	162	100	4	38	5 674	73
EE	162	35	8	6	10	1 099	94
FI	654	163	90	4	41	24 455	87
FR	12 278	1 670	1 465	280	381	252 980	1 551
DE	15 052	1 884	1 597	268	614	197 207	1 936
EL	1 008	210	116	42	49	6 828	673
HU	978	135	27	26	30	3 240	150
IE	**972**	**115**	**163**	**0.2**	**35**	-	**39**
IT	10 862	1 392	1 379	166	426	69 732	1 609
LV	186	28	9	7	10	12	9
LT	261	43	19	10	11	412	31
LU	91	12	7	1	-	8 282	20
MT	51	-	-	1	-	1 099	2
NL	2 529	-	187	44	65	59 477	403
PL	3 780	564	192	15	239	6 930	407
PT	1 719	174	96	215	92	8 085	571
RO	999	244	48	5	33	318	417
SK	395	61	54	3	23	1 302	94
SI	207	34	5	3	11	1 376	47
ES	7 424	776	914	153	292	44 926	1 904
SE	1 420	234	162	30	79	3 310	223
UK	10 787	1 351	1 289	479	465	100 999	2 489

* C&D includes all waste under NACE F Construction. Farm plastics includes all plastic waste under NACE A01/A02 Agriculture and forestry.

[6] Eurostat Waste Data portal, except tyres data from European Tyre and Rubber Manufacturers Association (ETRMA), www.etrma.org/tyres/ELTs/ELT-management/producer-responsibility.

1.2 Packaging

The 1994 Directive on Packaging and Packaging Waste required all Member States to introduce systems for the return and/or collection of used packaging to attain a series of recycling and recovery targets by material. Most schemes include producer fees but in other respects the PRIs are diverse. For example in the UK, a system of tradable credits for packaging is used, while taxation and deposit-refund systems are used in Denmark, Hungary and the Netherlands. Several Member States have also introduced packaging levies (see separate Working paper on this topic). Collection systems also differ from one country to another and from one region to another within the same country (there are around 50 different collection systems in Germany).[7]

A particularly important organisation dealing with packaging waste in the EU is PRO Europe. It is the umbrella organisation of 35 national producer responsibility systems engaged in the selective collection and recycling of packaging waste. According to PRO Europe, 33 packaging compliance schemes were active in 33 countries in 2010, of which 26 use the "Green Dot" (Box 1).

Box 1: The Green Dot

The Green Dot is the symbol for the organisation of recovery, sorting and recycling of sales packaging. The Green Dot label on packaging signifies that a financial contribution has been paid to a qualified national packaging recovery organisation, set up in accordance with the principles defined in the Directive on Packaging and Packaging Waste and the respective national laws.

Green Dot systems are internationally recognised models and aim to contribute to the successful implementation of producer responsibility by the companies involved. The symbol is a registered trademark in more than 170 countries and a licence fee is paid for its use. More than 170 000 companies are licensees of the Green Dot trade mark.

PRO Europe is responsible for awarding the Green Dot scheme to qualified national collection and recovery systems for the entire territory of Europe and Israel (except Germany and Russia). About 460 billion packaging items are labelled yearly with the Green Dot and more than 3 million tonnes of plastic packaging are recycled by PRO Europe member systems.

1.3 WEEE

EU legislation provides for the creation of collection schemes where consumers return their WEEE free of charge. It also requires substitution of certain heavy metals. Most if not all Member States now have PRIs in place for WEEE. Some enable individual producer responsibility (IPR) and others only collective producer responsibility (CPR). IPR is implemented in 13 Member States (e.g. Germany, Ireland, Sweden, Lithuania, Cyprus) in one form or another. In examining new approaches, Ireland could consider whether it can improve its implementation of IPR.

[7] PRO Europe (2010) *Producer Responsibility in Action*.

1.4 ELVs

PRIs for ELVs have been found in 24 Member States (including Luxembourg, which participates in the Belgian scheme). Several (Belgium, Bulgaria, Denmark, Greece, Latvia, Lithuania, Netherlands, Portugal and the UK) have organisations that co-ordinate the take-back and recovery of ELVs on behalf of producers. Countries with a good level of resources, effective administrative and experience of operating a highly regulated system of car disposal have been able to implement the ELV Directive relatively smoothly (e.g. Sweden, Germany, Netherlands).[8]

1.5 Batteries

In 2006, only six EU countries had systems to collect all types of used portable batteries. The new Batteries Directive took effect on 26 September 2008. The EU legislation obliges producers (manufacturers and importers) that place product on the market to finance the cost of collection, treatment and recycling of their market share of spent batteries and accumulators, regardless of the date the battery was placed on the market[9]. Member States may exempt producers that place small very small quantities in the market. They must also finance the cost of informing citizens of these arrangements. Since 26 September 2009, targets for the separate collection and recovery of batteries have had to be met.

The Directive lays down the following[10]:

- Articles 8 and 10: Collection requirements for all batteries and collection targets for portable batteries (Member States shall achieve minimum collection rate of 25 % by 26 September 2012 and 45 % by 26 September 2016.)
- Article 16: Minimum rules for operating national collection and recycling schemes, and in particular rules on how producers must finance these schemes (Member States shall ensure that producers, or third parties acting, on their behalf, finance any net costs arising from: the collection, treatment and recycling of all waste portable batteries and accumulators collected
- Article 17: To avoid 'free-riders', each EU Member State should keep a register of producers who place batteries on the national market
- Article 12(4): battery recycling processes must meet minimum levels of efficiency: (a) recycling of 65% by average weight of lead-acid batteries and accumulators, including recycling of the lead content to the highest degree that is technically feasible while avoiding excessive costs; (b) recycling of 75% by average weight of nickel-cadmium batteries and accumulators, including recycling of the cadmium content to the highest degree that is technically

[8] Ecologic (2007) *End of Life Vehicles (ELV) Directive: An assessment of the current state of implementation by Member States*, http://ecologic.eu/download/projekte/800-849/849/FC_3/SC_2_Study_ELV_Directive_March_2007.pdf.
[9] Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators, Article 18
[10] Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2006L0066:20081205:EN:PDF

feasible while avoiding excessive costs; and (c) recycling of 50 % by average weight of other waste batteries and accumulators.

Consumers must be able to hand in their waste batteries without charge or obligation to buy a replacement battery. Distributors and retailers are responsible for take-back programmes for portable batteries. Producers are responsible for take-back programmes for industrial batteries, regardless of the battery's origin or chemical composition, and also for collection schemes for automotive batteries.

As stipulated in the Battery Directive, compliance organisations have been set up in almost all Member States at this stage. These organisations are funded by battery producers at national level and deal with all the practical elements related to producer responsibility, such as collection, sorting, treatment, recycling, consumer communications and completion of reports submitted to national authorities on behalf of members.[11] The European Portable Battery Association (EPBA) works with these organisations to meet producer responsibility obligations. An important recent development is that in most countries, multiple and competing schemes are up and running.

1.6 Tyres

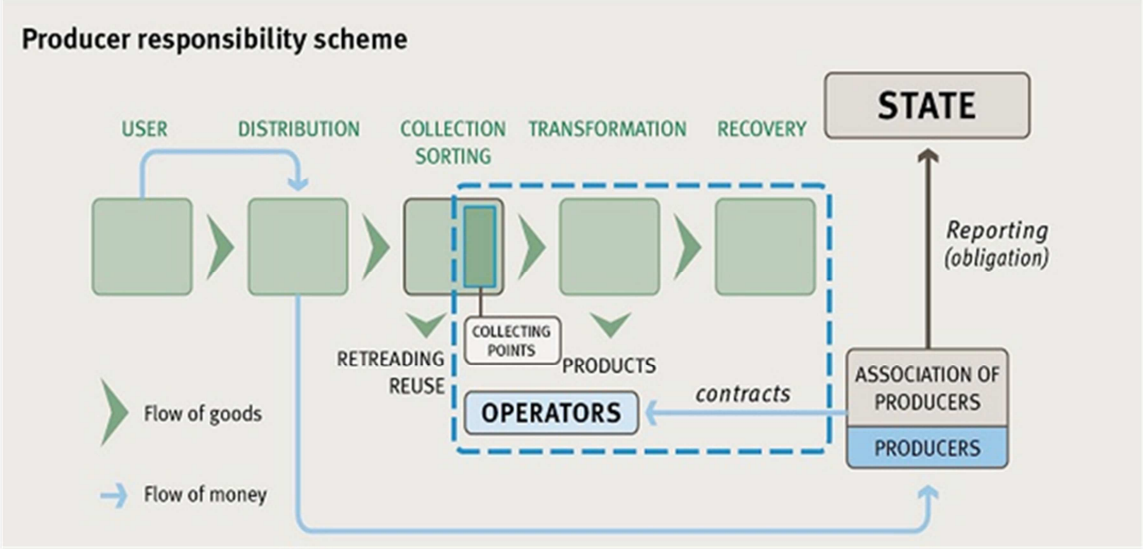

Figure 1: Producer Responsibility Initiative for tyres[12]

PRIs for tyres generally cover both consumer and professional tyres, except bicycle and small motorcycle tyres. In 2011, European countries with producer responsibility (those listed in Table 1 plus Norway and Turkey) accounted for 57% of used tyres in the EU.[13] Bulgaria and Cyprus still depend on landfilling to some extent. In 2010, EU-27+NO+CH had an average used tyre recovery rate of 96%,[14] which is remarkable compared with the recovery rates of some other sectors.

[11] EPBA (2010) *EPBA Sustainability Report*, www.epbaeurope.net/documents/EPBASustainabilityreport2010_final.pdf.
[12] European Tyre and Rubber Manufacturers Association (ETRMA), www.etrma.org/tyres/ELTs/ELT-management/producer-responsibility.
[13] See www.etrma.org/tyres/ELTs/ELT-management/producer-responsibility.
[14] See www.etrma.org/tyres/ELTs/recovery-routes-and-trends.

1.7 C&D

C&D waste is addressed under the revised Waste Framework Directive, which sets a target of 70% by 2020 for reuse, recycling and other forms of material recovery. Member States are still in the process of integrating the target into national legislation so it is difficult to assess how they will implement waste management plans to meet it.[15]

Producer responsibility schemes have been identified in six Member States: Austria, Germany, Ireland, Malta, Spain and the UK. It is likely that further Member States have recently put C&D PRI schemes in place or are in the process of developing them because most Member States are still working on implementing their waste management plans to reach the 70% target.

In countries such as Spain and Malta, industries must recover some types of C&D waste if the quantity generated exceeds a certain amount. In Spain for example, construction companies must separate different types of waste if they exceed the following amounts: 80 t concrete; 40 t bricks & tiles; 2 t metal; 1 t wood; 1 t glass, 0.5 t plastic; 0.5 t paper.[16]

1.8 Farm plastics

Approaches to agricultural waste management vary by Member State, from use of municipal waste collection facilities (Denmark, Finland and to some extent Germany and Sweden), to single-material recovery schemes such as for waste silage film in Ireland or pesticide packaging in France, to a lack of formal arrangements as seen in Greece, Italy, Portugal and Spain.[17]

Due to intensification and changes in farming practices, more and more plastic is being used on farms. Farm plastics are used for packaging, silage-making, horticultural and other purposes. They generally have a short lifespan (less than three years) and because of the way they are used, collected and stored, the level of contamination can be over 70% of the weight recovered.

Many Member States have therefore focused on the recovery of plastics, especially waste silage and horticultural film. France, Ireland and the Netherlands have national legislation requiring manufacturers and importers of agricultural film to arrange recovery. There are variations in implementation, e.g. in the Netherlands the product levy does not cover collection from the farm. Small-scale, localised schemes exist in other Member States (Austria, Belgium, Germany, Spain, Sweden), generally operated by film manufacturers. National pesticide packaging recovery schemes are in place in Belgium, Germany, the Netherlands and France.[18] Note that waste streams such as batteries, tyres and waste oils are likely to be covered by other PRIs.

Agricultural waste may be perceived as a lower priority than industrial or municipal waste due to the lower volumes involved. There may also be reluctance to impose additional costs on what may be an economically or politically sensitive sector. More practical barriers to PRI for farm waste can include concern about product contamination or disease transfer, complex logistics

[15] BIO et al. (2011) *Management of C&D Waste,* www.biois.com/wp/wp-content/uploads/2011/01/BIO_Construction-and-Demolition-Waste_Final-report_09022011.pdf.
[16] See www.ipcbee.com/vol26/6-ICPSD2011-P016.pdf.
[17] UK Environment Agency (2001) *Towards Sustainable Agricultural Waste Management*, http://publications.environment-agency.gov.uk/PDF/GEHO0003BIEO-E-E.pdf.
[18] Ibid.

and associated high costs, high reprocessing costs, the potential for free riders and low farmer awareness. A lack of organised schemes may lead farmers to resort to other disposal practices such as burning, burial, stockpiling or inclusion in household waste collection, although as much as possible is reused or recycled on farm.[19]

1.9 Waste streams not yet covered in Ireland

Several countries have introduced PRIs for a wide range of additional waste streams. A more complete picture of the application of producer responsibility in the EU can provide a useful source of inspiration when considering broader application of producer responsibility in Ireland.

Among the materials most commonly covered are waste oils of various kinds (mineral, motor, edible, lubricating), different types of paper/card, and old and unused medicines (Table 3).[20] Other materials do not yet seem to be covered in Europe but could be in future, e.g. paints and paint containers are covered by producer responsibility in Canada (British Columbia), the United States (California) and elsewhere.

[19] Ibid.
[20] IEEP, BIO et al.(2012) *Use of economic instruments and waste management performance*, DG Environment.

Table 3 PRIs for waste streams not covered in Ireland by Member State[21]

	Waste oils, oil filters	Paper, card	Medicines, medical waste	Plastic bags	Photo-chemicals, chemicals	Newspapers	Refrigerants	Pesticides, herbicides	Lamps, lightbulbs, fittings	Other (covered by only one Member State)	Total
AT	•	•	•	-	-	-	•	-	•	Bulky waste (metals, glass, plastics and wood); Expanded polystyrene; Plastic foils	8
BE	•	•	•	•	•	•	-	-	-	Disposable plastic kitchenware	7
BG	-	-	-	•	-	-	-	-	-	-	1
CY	•	•	-	-	-	-	-	-	-	-	2
CZ	•	-	-	•	-	-	-	-	-	-	2
DK	•	•	-	-	-	-	-	-	-	-	2
EE	-	•	•	•	-	-	-	-	-	-	3
FI	-	•	-	-	-	-	-	-	-	-	1
FR	•	•	•	-	•	-	•	•	-	Agricultural twine and netting; Clothes, household linen, shoes; Gas cylinders for domestic use; Household and professional furniture; Ink and ink cartridges; Mobile homes	12
DE	•	-	-	-	-	-	-	-	-	Commercial waste	1

[21] Based on IEEP, BIO et al.(2012) *Use of economic instruments and waste management performance*, DG Environment, and RPS for Forfàs (2006) *Waste Management Benchmarking Study*, www.forfas.ie/media/forfas060613_waste_benchmarking_report.pdf.

	Waste oils, oil filters	Paper, card	Medicines, medical waste	Plastic bags	Photo-chemicals, chemicals	Newspapers	Refrigerants	Pesticides, herbicides	Lamps, lightbulbs, fittings	Other (covered by only one Member State)	Total
EL	•	-	-	-	-	-	-	-	-	-	1
HU	-	-	-	?	-	-	-	-	-	-	0
IT	-	-	-	-	-	-	-	-	-	-	0
LV	•	•	-	-	-	-	-	-	-	-	2
LT	-	•	-	-	-	-	-	-	-	-	1
LU	-	-	-	-	-	-	-	-	-	-	0
MT	-	-	-	-	-	-	-	-	-	-	0
NL	•	•	-	-	•	-	-	-	-	Plastic panels; Plastic piping; Sheet glass	6
PL	-	-	-	-	-	-	-	-	-	-	0
PT	•	-	-	-	-	-	-	-	-	-	1
RO	-	-	-	-	-	-	-	-	-	-	0
SK	-	•	-	-	-	-	-	-	-	-	1
SI	•	-	•	-	-	-	-	•	-	Graveside candles	4
ES	•	-	-	-	-	-	-	-	-	-	1
SE	-	•	-	•	-	-	-	-	•	-	3
UK	-	-	-	-	-	• (Scotland)	-	-	-	-	1
#/27	13	12	5	5	3	2	2	2	2	-	46

Chapter 2: Waste management performance and cost-effectiveness

Costs and success in meeting targets vary considerably among schemes. This chapter aims to investigate a potential correlation between waste management performance in Member States and the cost characteristics of PRIs, i.e. between fees paid and share of waste collected, recycled or recovered. This can then serve as an input into the benchmarking of Irish PRIs. The following are indicators of the cost of PRIs:

- Cost for producers (fees);
- Cost per capita;
- Turnover of PROs;
- % of costs covered by producers;
- % of cost used for administration;
- % of cost used for information and awareness.

There is a severe lack of information available on costs of PRI schemes, though this varies by Member State – reports are more readily available for France for example than for Germany or the UK. Similarly on performance, data is available for individual PRIs but authoritative data at national level as collected by Eurostat is often of poor quality.

Better data transparency, in particular as to the costs of the schemes, would enable improved analysis to be undertaken and as such is to be encouraged. Independent auditing, and more clearly defined reporting and price-setting methods could also be considered. The recently formed EPR Club (www.eprclub.eu) might help promote the exchange of best practices in this area.

The link between one or several cost parameters and the overall performance of the PRI might be misleading since there are several other factors that can influence the success of a scheme. It is important to know about waste policy as a whole in the country, including for example the existence of mandatory targets, waste management plans and recycling infrastructure. This holistic approach provides a more solid basis for the benchmarking exercise.

2.1 Packaging

2.1.1 Cost indicators

- Producer fees

Producer fees per tonne of packaging material placed on the market vary greatly amongst Member States (Table 4). There are several reasons for this: schemes do not always cover 100% of the costs of collecting and recycling packaging; targets in Member States are not all the same; different collection schemes are used; and schemes cover different sectors (e.g. some cover

household, commercial and industrial packaging waste, while others cover only household and commercial).

Table 4 Overview of fees paid to packaging PRIs (EUR)[22]

	Annual fixed participation fee	Maximum average fee (latest available data) per tonne					
		Paper	Glass	Alu	Steel	Plastic	Wood
AT[2]	?	120	71	450	270	670	14
BE[2]	?	18	18	138	38	199	?
BG	min. 75 for producers placing ≤10t on market	80	40	100	30	130	50
CY[3]	?	47	29	21	95	106	?
CZ[2]	65 registration fee	106	59	82	61	216	42
EE	?	110	100	260	260	410	40
FI	min. 203 for producers with turnover >1m	24	10	21	3	21	0.40
FR[1]	?	163	5	61	30	238	?
DE[3]	?	175	74	?	?	1 296	?
EL	150	53	11	9	21	66	10
IE	**?**	**23**	**9**	**84**	**79**	**89**	**11**
IT	?	22	18	52	31	140	8
LV	84 min. licence fee	16	49	68	68	133	16
LT	?	59	261	113	113	311	?
LU[3]	?	38	26	149	23	343	14
NL	?	64	46	573	113	355	23
PL	?	150	40	300	?	600	80
PT	?	86	18	164	96	228	?
RO[3]	?	8	10	7	7	21	5
SE	?	58	?	282	282	153	?
SK[3]	max. 500 one-off joining fee	13	13	28	28	45	?
SI	?	87	38	79	79	112	57
ES	?	68	0.0028/unit, 19.7/tonne	102	85	377-472	21
UK	-	Varies depending upon value of tradable certificates					

[1] *Household packaging waste only*
[2] *Household and commercial packaging waste*
[3] *Household, commercial and industrial packaging waste*

[22] IEEP, BIO et al. (2012) *Use of economic instruments and waste management performance*, DG Environment.

- % of costs covered by producers

Table 5 Share of costs covered by producers and public/private nature of packaging PRIs[23]

MS	% of costs covered by producers	Public or private (i.e. producer) led
AT	100% (recycling, recovery of packaging waste)	Producer-led
BE	100% (collection, sorting and recycling of the packaging waste, as well as costs of collecting and disposing of/treating packaging as residual waste)	Producer-led
BG	Participating producers/importers finance the collection, recovery and recycling of packaging waste, and the implementation of information and communication campaigns to promote separate collection and recycling.	-
CY	Around 80% of collection, recycling and recovery costs from producers, 20% from local authorities	-
CZ	Participating producers/importers contribute financially to the collection, sorting and reprocessing of packaging waste	Producer-led and -funded
DK	Packaging waste management costs are included in the budgets of local authorities and are financed via household, consumer, retailer and industry taxation and management fees	Government-led. Dansk Retursystem (DRS) appointed by government to lead the recovery/recycling effort. Private operators (recycling) and local authorities (treatment) are responsible for management of household and commercial packaging waste.
EE	A packaging excise duty is levied on importers and producers of beverage packaging that fail to establish a packaging waste collection/recovery system.	Producer-led
FI	-	Government-led, producer-funded
FR	Most is covered by fillers, distributors and importers of packaging, the remainder from local taxes	Producer-led
DE	100% of costs covered by producers	Producer-led, nine schemes
EL	Participating producers/importers contribute financially to the functioning of the scheme	Government-led, producer-funded
HU	-	Producer-led
IE	**Fillers of packaging pay for the collection, recycling and recovery of packaging. Municipalities are reimbursed for 40% of the costs of the operation of the recycling scheme.**	**Voluntary agreement between industry and government, in response to the EU Packaging Directive**
IT	Participating producers/importers contribute financially to the activities of CONAI.	Producer-led, PRO collaborates with ANCI (national association of Italian municipalities)

[23] Various sources including PRO Europe.

LT	Participating producers/importers contribute financially to the management of waste packaging	-
LU	-	Producer-led
MT	-	Government-led, producer funded
NL	Importer/producer is responsible for the management and separate collection of packaging waste	Producer-led, public authorities responsible for collection of household glass and paper/cardboard packaging waste
PL	-	Producer-led
PT	-	Producer-led
RO	-	Producer-led
SK	-	Producer-led
SI	Producers/importers cover the costs of collecting, and reprocessing or disposal of packaging waste	-
UK	Varies, but typically of the order of 5-10%. The UK system was not intended to cover the full cost of collection, recovery and recycling of packaging waste.	More than 20 compliance schemes

2.1.2 Performance indicators

Tables 6 and 7 below show recovery and recycling rates for packaging from Eurostat. The highest performing Member States in terms of recovery in 2010 included Denmark (108%), the Netherlands (97%), Germany (96%), Belgium (96%), and Austria (92%). For recycling rates, Belgium (79%), the Netherlands (74%) and Germany (73%) were the best performers.

Table 6: Recovery rates for packaging waste (%)[24]

Member State	1997	2000	2003	2007	2008	2009	2010
Austria	69.3	76.5	77.3	90.2	91.5	92.6	92.2%
Belgium	62.3	70.9	91.5	95.2	95	95.2	95.5%
Bulgaria	:	:	:	54.8	50.4	45.9	62.0%
Cyprus	:	:	:	25.9	34.3	42.5	50.1%
Czech Republic	:	:	59	71.2	74.1	75.8	77.9%
Denmark	83.7	91.2	89.3	96.5	97.5	108.1	108.1%
Estonia	:	:	:	51.7	44.7	58.9	61.6%
Finland	53.9	60.1	67.1	83.7	90	88	85.0%
France	54.9	57	63.6	67.4	65.2	66.4	70.3%
Germany	82.8	80.6	86.3	94.7	94.8	94.9	95.7%
Greece	37	33.3	33.1	48	43.8	52.3	58.8%

[24] Eurostat data http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tenoo063.

Member State	1997	2000	2003	2007	2008	2009	2010
Hungary	:	:	:	54.6	56.5	55	56.0%
Ireland	**15.2**	**18.9**	**51.2**	**63.6**	**64.7**	**69.9**	**73.7%**
Italy	31.8	42.5	58.4	67	68.6	74	74.7%
Latvia	:	:	:	40.9	51.7	51.1	52.7%
Lithuania	:	:	:	44.1	52.2	58.4	60.9%
Luxembourg	43.7	58.9	86.7	92	93.7	91.4	90.3%
Malta	:	:	:	10.4	45.9	36.9	29.2%
Netherlands	77.6	77.4	90.5	93.5	95.1	96.9	96.8%
Poland	:	:	:	60	50.6	50.3	53.7%
Portugal	:	45	51.9	59.1	66	65.8	61.3%
Romania	:	:	:	36.6	40.7	46.7	48.3%
Slovakia	:	:	47	67.4	50	63.2	47.5%
Slovenia	:	:	:	53	57.9	53.4	65.8%
Spain	37.5	44.2	48.3	62.1	65.4	67.8	70.0%
Sweden	65.1	65.6	89.2	81.5	79.8	77	76.7%
UK	26.5	45.4	52.7	63.8	65.5	66.7	67.3%
EU-27	:	:	:	72.6	72.8	74.6	76.2%

Table 7: Recycling rates for packaging waste (%)[25]

Member State	1997	2000	2003	2007	2008	2009	2010
Austria	64.5	69.4	64.2	67.2	67.9	66.9	66.6%
Belgium	62.3	62.5	73.9	80.4	78.9	79.1	79.8%
Bulgaria	:	:	:	54.8	50.3	45.9	61.6%
Cyprus	:	:	:	25.7	34	42.2	50.0%
Czech Republic	:	:	51.4	65.9	67.1	68.8	70.0%
Denmark	40.1	55.7	53.8	56.8	59.7	84	84.0%
Estonia	:	:	:	49.6	43.5	57.2	56.1%
Finland	41.7	49.8	40.8	51.9	56.7	55.5	55.4%
France	39.7	42.2	47.9	57	55.2	56.4[26]	61.1%
Germany	80.6	78	70.6	66.9	70.5	73.5	72.7%
Greece	37	33.3	33.1	48	43.8	52.3	58.7%
Hungary	:	:	:	46.4	50.8	51.1	51.7%
Ireland	**15.2**	**18.9**	**51.2**	**60.6**	**61.7**	**64.9**	66.2%

[25] Eurostat data http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tenooo63.
[26] The equivalent figure for 2010 is 64.3, according to ADEME (2012) *Extended Producer Responsibility in France: Panorama*, 2011 Edition.

Member State	1997	2000	2003	2007	2008	2009	2010
Italy	3	38.4	51.4	56.8	59.6	64	64.4%
Latvia	:	:	:	39.6	46.8	44.9	48.9%
Lithuania	:	:	:	42.9	51.7	57.7	60.4%
Luxembourg	38.4	45.2	60.1	62.5	63.6	61	66.0%
Malta	:	:	:	10.4	45.9	36	28.5%
Netherlands	55.2	58.8	56.4	69.8	72.4	74.9	73.9%
Poland	:	:	:	48.2	42.9	36.8	38.9%
Portugal	:	30.8	38.3	56.5	61	59.9	55.5%
Romania	:	:	:	30.6	33.5	40.5	43.4%
Slovenia	:	:	:	46.9	52.4	49.6	45.7%
Slovakia	:	:	36.3	61.1	47.7	59.9	61.0%
Spain	33.5	39.8	43.1	56.3	59.1	60.3	61.9%
Sweden	57.9	57.8	60	59.3	58.5	58.9	54.3%
UK	24.1	39.9	46.8	59.3	61.5	61.8	60.7%
EU-27	:	:	:	59.2	60.5	62.5	63.3%

2.1.3 Cost-effectiveness

In terms of cost-effectiveness, producer fees only cover the full costs to waste collection authorities in three Member States: Austria, Belgium and Germany. This will also be the case in Finland after implementation of a new waste law in 2013. Only those three and Spain had met the Packaging Directive targets by 2008. This suggests that including the full costs of waste management in producer fees was important to meeting the targets.

Evidence on the link between the absolute level of fees paid to PRIs and packaging recovery/recycling performance is not conclusive. Some schemes with lower fees exhibit high levels of recovery/recycling (e.g. Belgium and Luxembourg) and some schemes with higher fees exhibit low levels of recovery/recycling (e.g. Estonia and Poland).

The Belgian FostPlus scheme for municipal packaging waste was identified as the best value for money in terms of the amount of packaging waste recovered and recycled compared with the cost of contributions to the scheme. Germany and the Netherlands also have particularly successful schemes.

Table 8 Cost-effectiveness indicators by packaging PRI[27]

MS	PRO	Packaging waste per year (kt)	Recovered (kt)	Recycled (kt)	Turnover (€m)	Cost (€m)	Admin. (€m)	Information and awareness (€m)
AT	ARA	1 100	782 (2011)	700 (2011)	158.8 + 39.5 (material sales) (2011)	148.5 (2011)		
BE	Fost Plus	116 kg / inhabitant / year	726 (2011)	701 (2011)	176.8 (2011)	185.4 (2011)		
BG	EcoPack BG	117 (2010)		56 (2010)				
CY	Green Dot CY	40 (2010)			8 (2011)	7.3 (2011)		0.6(2011)
CZ	EKO-KOM	864 (2011)	621 (2011)					
EE	EEn Recovery Organisation	240 (2010)			3.236 (2011)	3.0 (2011)		
FI	Environmental Register of Packaging PYR	708 (2010)	602 (2010)	392 (2010)				
FR	EcoEmballages (and Adelphe)	4 653 (2011)		3 120 (2011)	584.2 (2011)	580.8 (2011)		15.6 (2011)
DE	DSD	13 500 (2007)	3 320 (2007)	2 500 (2011)		1 500 (2000)		
EL	Hellenic Recovery Recycling Corporation			478 (2011)				
HU	ÖKO-Pannon	547 (2010)	313 (2010)	178 (2011)	23.2 (2010)	22.8 (2010)	1.7 (2010)	1.3 (2010)
IT	CONAI	11 470 (2011)	742 (2011)	858 (2011)	26.8 (2011)	26.2 (2011)	13 (2011)	6.4 (2011)
LV	Latvijas Zalais punkts	111 (2009)	58 (2009)		6.1(2010)	5.9 (2010)	0.6 (2010)	0.3 (2010)
LT	Žaliasis taškas							
LU	Valorlux	62 (2011)	47 (2011)	46 (2011)	7.5 (2011)	7.5 (2011)	0.5 (2011)	0.7 (2011)
NL	Nedvang	2 724 (2010)	2 321 (2010)	2 013 (2010)				
PT	Sociedade Ponto Verde			710 978 (2011)	59.6 (2009)	64.5 (2009)	8.4 (2009)	2.4 (2009)

[27] Various sources including annual reports of PROs.

RO	ECO-ROM AMBALAJE	613 (2011)	361 (2011)		41.8 (2011)	40.9 (2011)		
SE	FTI (Förpackningsoch Tidningsinsamlingen	741	735					
SK	Envi-Pak	350						
SI	Slopak	158 (2009)	97 (2009)	92 (2009)				
ES	ECOEMBES	1 845 (2010)	2 017 (2010)			485 (2010)		

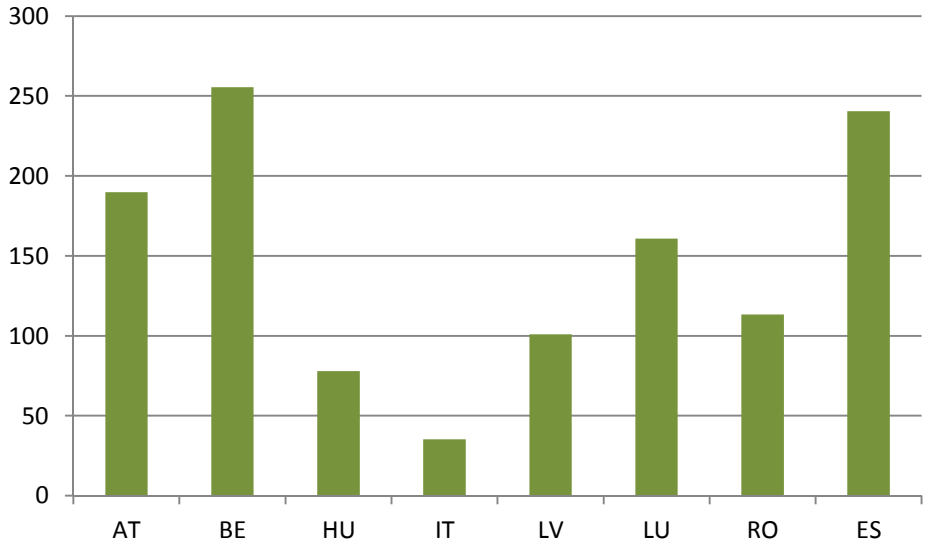

Figure 2: Approximate cost per tonne of packaging recovered (EUR)

2.2 WEEE

2.2.1 Cost indicators

- Producer fees

Most PRIs dealing with WEEE in the EU charge a fee based on the amount placed on the market by producers (either in units, kg or tonne). The rationale is to ensure that producers are charged in relation to their market share.

Fees paid to municipalities for collection of WEEE range from 26 EUR/tonne in Portugal, to 45 EUR/tonne in Belgium and 50 EUR/tonne in Finland, to 80 EUR/tonne in Spain. In Belgium, this cost only covers management of WEEE at municipal civic amenity sites and does not include the costs of transportation, treatment, recovery, recycling and final disposal of WEEE. Details on cost of registration for producers is shown in Annex 1.

The ElektroG scheme in Germany provides producers a choice to either finance the WEEE of their own products (through sampling or sorting) or to calculate their obligation based on market share in the same way as historical WEEE. Fees paid in Germany vary according to the contracts negotiated with waste management firms.

In France, in July 2006 the Association of French Mayors announced that they had come to an agreement with producers that would compensate municipalities up to 20 million EUR/year for collection of WEEE. That is around 150 EUR/tonne on average, based on an estimated 123 000 tonnes collected by municipalities (around 2 kg/capita/year). The breakdown is shown in the following table:

Table 9: Financial compensation to municipalities for collection of WEEE in France

Technical Support		Conditions	Unit	Euro paid
All Areas	Fixed payment	Open collection point[69] Minimum collection 1.5 kg/cap./yr One Point for 15,000 inhabitants (50% paid if residual population >5000	Per year	1560
	Variable	> 8 handling units	Per tonne	20
		> 24 handling units	Per tonne	40
		> 2000 handling units or > 100 ton	Per tonne	65
Deviations for specific areas	Fixed payment: Rural Population < 70/km²	Open collection point Minimum collection: 1.5 kg/capita/yr One point for 12000 inhabitants (50% paid if residual population >5000	Per year	1560
	Variable: Urban population >700 km²	>24 handling units	Per tonne	50-56
		>2000 handling units or 100 ton	Per tonne	75-81
Communication Support Euro per capita		Year 1: 0.20 Euro/capita , Year 2: 0.15 Euro/capita, Year 3: 0.075 Euro/capita		

To take another detailed example, municipal collection sites in Austria make contracts with compliance schemes worth a total (paid by producers) of 2.7 million EUR per year, allocated based on tonnes collected by category (Table 10).[28] In the absence of contracts (about 7.5% of WEEE), lump sum payments are made (Table 11).

Table 10: Variable fees (with contracts) in Austria by category (EUR/tonne)[28]

	Large appliances	Refrigeration	TV & monitors	Small appliances	Lamps	Average
Up to July 2006 (4.5 kg/person)	35	96	135	70	531	75
From August 2006 (6.0 kg/person)	40	55	85	52	430	57
Total (€m/year)	0.56	0.63	0.83	0.54	0.18	

[28] Ökopol (2007) *The Producer Responsibility Principle of the WEEE Directive*, ec.europa.eu/environment/waste/weee/pdf/final_rep_okopol.pdf.

Table 11: Lump sum payments (without contracts) in Austria by category (EUR/year)[28]

	Large appliances	Refrigeration	TV & monitors	Small appliances	Lamps	Total
Large WCC* (300 in Austria)	710	710	825	420	435	3 100
Small WCC (1 200 in Austria)	157	157	312	180	173	980
Minimum quantity (tonnes)	*4*	*3.5*	*1.5*	*1.5*	*0.5*	

*WCC: Waste collection centre

- Cost per capita

Fees paid to municipalities for collection of WEEE in Belgium are equivalent to 0.22 EUR/inhabitant/year, and in France around 0.30 EUR/inhabitant/year.

- % of costs covered by producers

In nine Member States (Austria, Belgium, Cyprus, Czech Republic, Finland, Ireland, Latvia, Poland and Sweden), producers cover the full cost of waste management (collection, recycling and recovery).

Table 12 Share of costs covered by producers and public/private nature of WEEE PRIs[29]

MS	% of costs covered by producers	Public or private (i.e. producer) led
AT	100% of costs from the WEEE collection sites onwards	Producer-led
BE	100%	Producer-led
CY	100% (covers collection, recycling and recovery)	-
CZ	100%	Government-led, producer-funded
DK	Producers responsible for providing collection equipment and treatment from private households; local authorities responsible for collection and sorting.	Government-led
FI	100%	Producer-led, government regulated
FR	-	Producer-led
DE	Producers are responsible for providing collection equipment and ensuring their emptying; municipal collection services are responsible for the collection of B2C WEEE.	Producer-led, government-regulated. Public authorities responsible for collection of household WEEE.
EL	-	Government-led, producer-funded
IE	**Producers do not cover all costs. €2 million/year is given to local authorities for WEEE collected at Civic Amenity Sites (CASs) (€101.38/tonne) from the Environmental Fund (landfill tax, plastic bag levy).**	**Voluntary agreement between industry and government in response to the WEEE Directive**

[29] Various sources including PRO Europe.

MS	% of costs covered by producers	Public or private (i.e. producer) led
	Cost to retailers: were given 20% of visible fee but from February 2011 visible fees ceased on all categories except one (to cease in Feb 2013))	
IT	-	Producer-led
LV	100% (covers collection and recycling)	Producer-led
LT	-	Producer-led
LU	-	Producer-led
NL	-	Producer-led
PL	100%	Government-led, producer-funded
PT	-	Producer-led
RO	-	Producer-led
SE	100% (covers collection of WEEE from municipal collection points and their treatment/processing)	Producer-led, public authorities responsible for collection of household WEEE
SK	-	Producer-led, public authorities responsible for collection of WEEE
SI	-	Producer-led
UK	In principle producers cover costs from the point of collection for B2C; some contribution is made to local authorities for collection costs (but does not cover their costs in full).	Valpak appointed by government to lead the recovery/recycling effort

- Cost of registration for producers

See table in Annex 1.

2.2.2 Performance indicators

The WEEE Directive (2002/96/EC) set the following targets for 2006:

- Minimum collection rate of 4kg per inhabitant per year;
- 70-80% recovery (depending on category of WEEE); and
- 50-80% recycling including reuse (depending on category of WEEE).

The recast WEEE Directive changes these targets to the following:

- A collection target for 2019 of 65% of WEEE placed on the market (in the previous three years), (with an interim collection target of 45% by 2016); or
- A collection target of 85% of WEEE generated each year by 2019; plus

- 70-80% recovery by 2015 (increasing to 75-85% after 6 years) (depending on category of WEEE); and
- 50-75% recycling including reuse by 2015 (increasing to 55-80% after 6 years) (depending on category of WEEE).

Despite the laws in place, only around one third of WEEE in the EU is separately collected and appropriately treated.[30] WEEE PRIs are structured in a wide variety of ways, which makes comparison difficult. However, some best performers can be identified: by 2010, 20 Member States had reported meeting the 4kg per capita collection target (Spain, Latvia, Lithuania, Malta, Poland and Romania had not; data for Cyprus refers to 2008). For a detailed list of the number of collection points for WEEE and Batteries, see Annex 2.

Table 13: WEEE by country (kg/capita), 2010[31]

MS	Products put on the market	Waste collected	Waste collected from households	Reuse	Recovery	Total recycling and reuse
AT	19.8	8.9	8.7	0.2	7.9	7.1
BE	27	9.7	9.3	0.5	8.4	7.8
BG	6.8	6	5.9	0	4.8	4.7
CY*	22.5	3.0	2.9	n.a	n.a	n.a
CZ	15.8	5	5	0	4.7	4.4
DE	21.2	9.5	8.8	0.1	9	7.9
DK	26.6	14.9	14.8	0	13.6	12.5
EE	9.8	4.2	4.2	0	4	3.5
ES	16.2	3.4	3.2	0	2.5	2.3
FI	27.6	9.5	9.1	0	8.7	8.4
FR	25.2	6.7	6.4	0.2	5.5	5.2
GR	15.8	4.1	3.9	0	4	4
HU	12.4	4.1	3.9	0	3.5	3.3
IE	**21.5**	**9.9**	**8.2**	**0.1**	**8.1**	**8**
IT	18.5	4.4	4.2	0	0	0
LT	7.3	2.7	2.7	0	2.1	2
LU	33.6	9.5	9.4	0	8.6	8.2
LV	6.8	1.9	1.9	0	1.6	1.6
MT	34.4	3.7	3.4	n.a	n.a	n.a

[30] For an overview, see http://ec.europa.eu/environment/waste/weee/index_en.htm.
[31] Eurostat, database Waste Electrical and Electronic Equipment (WEEE) (env_waselee), http://epp.eurostat.ec.europa.eu/portal/page/portal/environment/data/database.

MS	Products put on the market	Waste collected	Waste collected from households	Reuse	Recovery	Total recycling and reuse
NL	3.7	7.7	7.3	0	7.3	6.2
PO	12.8	2.9	2.8	n.a	n.a	n.a
PT	14.8	4.4	4.4	0	3.8	3.7
RO	7.1	1.2	1.1	0	1.1	1
SE	24.8	17.2	15.9	0	15.8	14.4
SI	13.9	4.2	4	0	3.4	3.3
SK	9.1	4	3.9	0.1	3.6	3.5
UK	24.6	7.7	7.4	0.6	0	0

*in 2008

2.2.3 Cost-effectiveness

Table 14 Cost-effectiveness indicators by WEEE PRI[32]

MS	PRO	WEEE per year (tonnes)	Collected (tonnes)	Recycled / recovered (tonnes)	Turnover (€m)	Cost (€m)	% information and awareness
AT	UFH	150 000 (2010)					
BE	Recupel	280 000 (2010)	110 373 (2011)		38.9 (2011)	39.1 (2011)	
CY	Electro Cyclosis		750 (2010)				
CZ	Asekol	37 086 (2011)	17 657 (2011)		6.8 (2011)	5.8 (2011)	
	Elektrowin		24 800 (2011)	22 500 (2011)	5.9 (2011)	6.2 (2011)	
DK	Elretur	150 000 (2010)					
FR	Ecosystemes	1 061 000 (2010)	311 515 (2010)				
	Ecologic	73 483 (2011)	70 000 treated (2010)	62 581 (2010)	21.5 (2010)		

[32] Various sources including annual reports of PROs.

	Recyclum	13 704 (collected in 2010)			17.9 (2010)	17.9 (2010)	€8.6m (2010)
DE	Lightcycle		8 275 (2010)				
EL	Appliances Recycling		46 377 (2010)	51 335 (2010)	17 (2010)	21.5 (2010)	
	Fotokiklosi	3 300 (2011)	262 (2011)				
IE	**WEEE Ireland**	**69 517**	**25 991**	**21 486**	**1.4**	**4.7**	**2.5**
	ERP Ireland		**8 967**	**9 527**	**2.3**	**3.3**	**1**
IT	Ecodom	260 090 (2011)	76 108 (2011)	74 272 (2011)	34.3 (2011)	29.9 (2011)	€0.38m
	Ecoped		260 090 (2011)				
	ReMedia		37 096 (2011)	32 689 (2011)			
LV	Latvijas Zalais punkts	5 244 (2009)		1 366 (2009)			
LT	EPA	11 000 (2010)					
NL	ICT Milieu	71 300	23 000 (2007)	22 310 (2007)			
	Wecycle		106 300 (2010)		3 641 702 (2010)	4.2 (2010), €0.22/kg (collection in 2010), €0.29/kg recycling in 2010)	
RO	ECOTIC		8 150 (2011)				
SE	El-Kretsen		154 186 (2011)	16.3 kg/capita			
SK	Envidom		11 734 (2011)		3.9 (2011)	3.9 (2011), €0.35/kg	
	SEWA	50 615 (2010)	5 656 (2010)	5 229 (2010)	3.2 (2010)	3.2 (2010)	
SI	ZEOS	16 238 (2011)	6 479 (2011)		2.6 (2011)	2.6 (2011)	
	Interseroh	8 857 (2010)	2 466 (2010)	2 256 (2010)	0.8 (2010)		
ES	Ecotic Fundacion	800 000 (2010)	152 038 (2010)	39 468 (2010)	14.1 (2010)	14.15 (2010)	

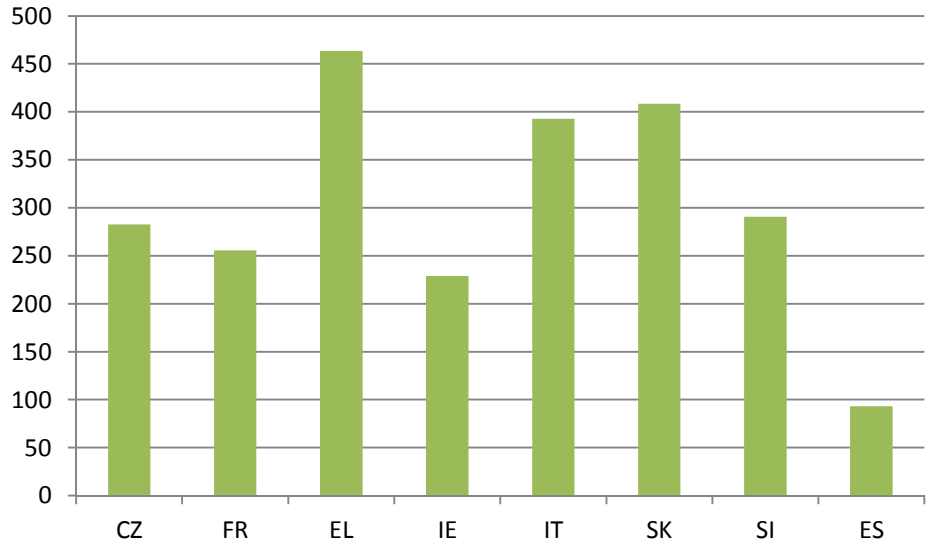

Figure 3: Approximate cost per tonne of WEEE recovered or recycled (EUR)

2.3 End-of-life vehicles

2.3.1 Cost indicators

- Cost for producers (fees)

Only limited information is available on financial contributions and countries are not directly comparable, as seen in the table below.

Table 15 Financial contributions to ELV PRIs

	Financial contribution	Paid by
CZ	EURO III or higher standard: no fee EURO II standard: 122 EUR/vehicle EURO I standard: 205 EUR/vehicle	The person who registers the used M1 or N1 vehicle
DK	From January 2012: 21.54 EUR/tonne for landfilled shredder residue; from January 2015: 63.70 EUR/tonne 12.10 EUR annual environmental fee	Landfiller of residue Car owner
FI	One-off joining fee per producer (typically less than 1 000) and less than 5 EUR per car sold	Producer/importer
NL	15 EUR per new car registration	Producer/importer, but ultimately passed on to the consumer
PT	<500 vehicles: 250 EUR 500 to 9 999 vehicles: 500 EUR From 10 000 to 20 000 vehicles: 1 000 EUR >20 000 vehicles: 1 500 EUR	Producer/importer
SK	66.67 EUR/kg contribution to recycling fund	Producer/importer
SI	40 EUR/tonne of new vehicle	

- % of costs covered by producers

Table 16 Share of costs covered by producers and public/private nature of ELV PRIs[33]

MS	% of costs covered by producers	Public or private (i.e. producer) led
BE	Federations finance the monitoring body. Cost of collection, recycling and recovery are covered by the value of parts and materials.	Producer-led
CZ	-	Government-led, producer-funded
DK	-	Government-led
EE	100% (covers collection and treatment of ELV)	-
FI	100 % (covers collection, transport and treatment of ELV)	Producer-led, regulated by government
FR	-	Producer-led
DE	100% (covers collection and treatment).	Producer-led
EL	-	Government-led, producer-funded
IT	-	Producer-led
LV	-	Producer-led
LT	-	Producer-led
LU	-	Producer-led
NL	Cost split between producers, importers and consumers	Producer-led
UK	-	Producer-led

2.3.2 Performance indicators

In 2006, all Member States with the exception of Ireland and Italy met the 80% reuse and recovery rate targets set under the ELV Directive. In 2010, the latest available Eurostat data, all Member States with the exception of Finland, France, Denmark and Ireland had reached an 85% minimum recycling, reuse and recovery rate. Germany (106%), Austria (97%), Finland (95%), Netherlands (95%), Belgium (91%) and Sweden (91%) were amongst the best-performing Member States. No data is available for Malta.

Table 17: Reuse, recycling and recovery rates for ELVs (%)[34]

Member State	2006	2007	2008	2009	2010
Austria	86	86	96.1	96.1	96.5
Belgium	89.99	90.07	90.24	90.57	91.2
Bulgaria	87.24	92.67	86.69	89.19	89.2

[33] Various sources including PRO Europe.
[34] Eurostat extrapolation, last updated 09 November 2012: epp.eurostat.ec.europa.eu/portal/page/portal/waste/data/wastestreams/elvs .

Member State	2006	2007	2008	2009	2010
Cyprus	86.61	83.39	79.83	92.92	86.9
Czech Republic	85.1	85.1	86	86.3	86.3
Denmark	80	81.2	82.9	81.7	90.7
Estonia	82.54	82.21	92.7	87.37	78.4
Finland	83	81	81	81	95
France	81	81.5	81.4	82.13	81.9
Germany	89.5	90.4	92.9	86.7	106.2
Greece	82.3	84.11	85.73	87.37	86.5
Hungary	81.5	82.8	84.44	86.2	86.8
Ireland	**78.1**	**81.34**	**81.8**	**82.3**	**77.4**
Italy	72.7	83.1	87.1	84.6	85.4
Latvia	85.99	91	89	86	86.1
Lithuania	92	86.7	85	86	88.5
Luxembourg	85.78	85.16	85	85	88
Netherlands	85.2	85.3	85.6	85.2	95.3
Poland	85.8	76.99	80.13	88	89.8
Portugal	86.1	85.7	87.2	86.9	86.8
Romania	80.27	85.69	86.45	85.29	85.5
Slovakia	83.6	88.62	88.84	89.58	90.2
Slovenia	79.6	88.68	89.67	87.31	90.6
Spain	84	85.11	85.68	86.04	85.7
Sweden	85	90	91	90	91.1
United Kingdom	82.29	83.08	84	83.54	85.6

Note that even the best-performing schemes have difficulty ensuring the responsible management of *all* ELV (not just those being recycled and recovered through the systems established for the purpose). In both Austria and Germany, for example, it appears there are still many vehicles being exported for use abroad rather than going for domestic treatment. In Belgium, there still seems to be a considerable proportion of ELV shredded in non-certified facilities. This can make it difficult for ELV dismantling facilities to operate at capacity. As a result, Austria is considering introducing control mechanisms to allow exports only if certain environmental standards are met in the destination country, and Germany is considering measures to place roadworthiness or CO_2-emissions criteria on exported vehicles.

2.3.3 Cost-effectiveness

Table 18 Cost-effectiveness indicators by ELVs PRI[35]

MS	PRO	Number of cars placed on the market	Recovered / reused (tonnes)	Recycled (tonnes)	Turnover (€m)	Cost (€m)
BE	Febelauto		176 445 (2010)	160 564 (2010)	1.44 (2010)	1.41 (2010)
PT	Valorcar	212 727 (2011)	39 901 (number of cars, 2011)	37 528 (number of cars, 2011)	0.291 (2011)	0.237 (2011)

2.4 Batteries

2.4.1 Cost indicators

- Cost for producers (fees)

Schemes charge producers a fee based on the amount of batteries placed on the market, either per kg, per battery or according to market share. Fees are based on a classification of batteries that varies from one Member State to another, e.g. consumer / vehicle / industrial batteries in Austria and Lithuania; chemical content (lead-acid / nickel-cadmium / alkaline/zinc carbon / lithium / button / lithium-ion) in Latvia and Portugal; size or weight of battery in Cyprus and Slovakia.

Refer to Annex 1 for a comparison of registration fees charged to producers in Member States.

- % of costs covered by producers

In seven Member States (Austria, Cyprus, Estonia, Finland, Greece, Latvia and Sweden), producers cover 100% of the cost of waste management.

Table 19 Share of costs covered by producers and public/private nature of batteries PRIs[36]

MS	% of costs covered by producers	Public or private (i.e. producer) led
AT	100% (collection and treatment)	Producer-led
BE	-	Government-led, funded by government, consumers and producers
BG	-	Public authorities responsible for collection Licenses for recycling and reuse of lead-acid batteries and accumulators have been issued to the private companies Monbat Montana, KCM Plovdiv and LZC Kardzhali

[35] Various sources including annual reports of PROs.
[36] Various sources including PRO Europe.

MS	% of costs covered by producers	Public or private (i.e. producer) led
CY	100% (covers collection, recycling and recovery)	-
DE	-	Producer-led
DK	-	Government-led
EE	100% (collection and treatment)	-
FI	100%	Producer-led, regulated by government
FR	-	Producer-led, authorised by public authorities
CZ	-	Government-led, producer-funded
EL	100% (covers collection, transportation, recycling, awareness raising activities and shipment of batteries abroad for recycling)	Government-led, producer-funded
IE	**Producers are required to finance any net costs arising from the collection, storage, treatment and recovery and/or disposal of waste batteries and/or accumulators, and any public information campaign on the collection, storage, treatment and recovery and/or disposal of portable batteries. For batteries, unlike for other WEEE categories, funding is not provided through the Environment Fund or contributions from retailers.**	**Voluntary agreement between Irish Industry and the government, in response to the Batteries Directive**
IT	-	Producer-led
LT	-	Producer-led
LU	-	Established by government, led and funded by producers, importers, distributors and retailers
LV	100%	Producer-led
NL	-	Producer-led
PT	-	Producer-led
SE	100%	-
SI	Costs split between producers, importers, retailers and final consumers	-
UK	Producers are obliged to fund the net costs arising from the collection, treatment and recycling of batteries	Producer-led

2.4.2 Performance indicators

Various Member State and PRO websites give an idea of the situation in Europe. Examples of PROs that have achieved collection and recovery rates above 50% in the past include SAFT-NIFE and BATREC in Sweden, BIBAT in Holland, CollectNicad in Brussels (Belgium), GRS Batterien in Germany and Screlec in France.[37]

Recent data on portable batteries collection was presented in a study done by EPBA (European Portable Batteries Association), which shows significant progress in waste portable batteries collection. Table 20 illustrates the figures from the study on the collection rates of portable batteries in all Member States. According to the table, only three Member States (Cyprus, Malta and Romania) probably missed the 25% collection target in 2012 and this is due to their collection schemes starting to operate only in 2012. In 2011-2012 seven countries had already achieved collection rates above 45% target (Belgium, Luxembourg, Austria, Germany, Lithuania, Denmark and Slovakia) as can be seen in Figure 2. For some Member States, collection rates have increased significantly, which raises concerns over reporting issues.

Although the progress made is impressive, it is expected that reaching a collection target of 45% by 26 September 2016 will be challenging for many Member States. This is partly due to the large variation of existing take-back schemes and varying levels of consumer awareness in Member States. The picture is further complicated by the fact that as the share of rechargeable batteries with longer lifetimes is growing, fewer batteries will become available for collection in coming years. In some Member States where waste battery collection was just recently introduced, the network of collection points and waste sorting habits are not developed enough to sustain a 45% collection rate. For a detailed list of the number of collection points for WEEE and Batteries in the Member States, see Annex 2.

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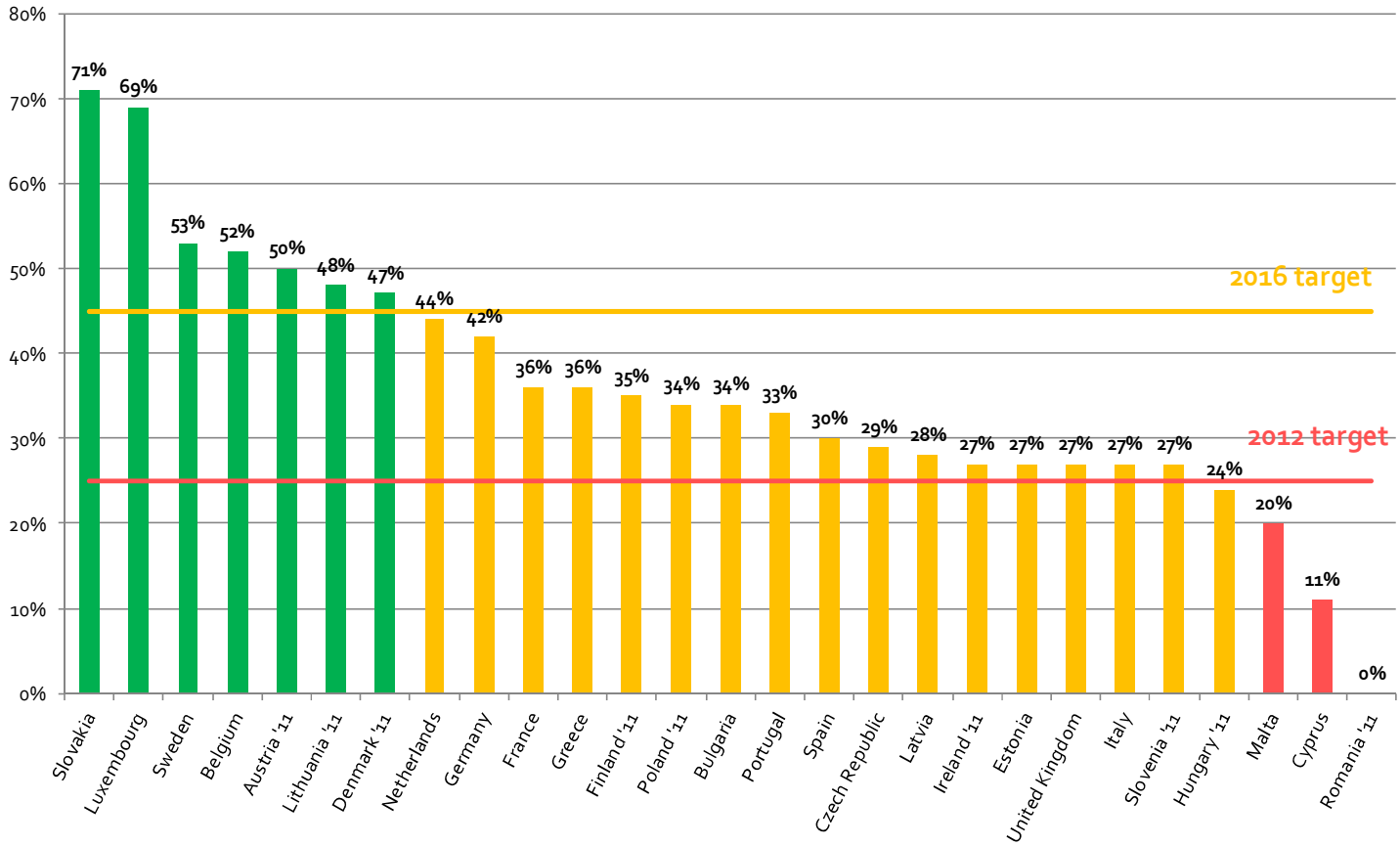
[37] Source: www.rebatt.co.uk/batteryrecycling.shtml.

Table 20: Portable batteries collection rates in the EU Member States in 2012 (2011 where indicated)[38]



2.4.3 Cost-effectiveness

Table 21 Cost-performance indicators by batteries PRI[39]

MS	PRO	Batteries placed on the market (tonnes)	Collected (tonnes)	Recycled (tonnes)	Turnover (€m)	Cost (€m)
CY	Afis Cyprus		22.2 (2010)			
DK	European Recycling Platform	24 000 (2010)	19 000 (2010)	14 000 (2010)		
IE	**WEEE Ireland**	**1 462 (2011)**	**445 (2011)**			
	ERP	**554 (2011)**	**168 (2011)**			
FR	Screlec	10 788 (2011)	3 618 (2011)		5.4 (2011)	5.4 (2011)

[38] EPBA (2013) The collection of waste portable batteries in Europe in view of the achievability of the collection targets set by Batteries Directive 2006/66/EC and Stibat, available at: www.epbaeurope.net/documents/Perchards_Sagis-EPBA_collection_target_report_-_Final.pdf

[39] Various sources including annual reports of PROs.

MS	PRO	Batteries placed on the market (tonnes)	Collected (tonnes)	Recycled (tonnes)	Turnover (€m)	Cost (€m)
	Corépile		7 980 (2011)	7 421 (2011)		
DE	GRS Batterien	32 946 (2011)	14 728	15 442 (2011)		
NL	Wecycle	8 099 (2010)	3 385 (2010)			
PT	Valorcar	18 398 (2011)		24 752 (2010)	0.494 (2011)	0.2 (2011)
SI	ZEOS		63 (2011)			
	Interseroh		280.4 (2010)		0.23 (2010)	

2.5 Tyres

2.5.1 Cost indicators

- Cost for producers (fees)

In the EU, three main types of management schemes are used to manage end-of-life tyres (ELT): the tax model (applied in only a very limited number of cases), the free market model and the producer responsibility model (Figure 4).

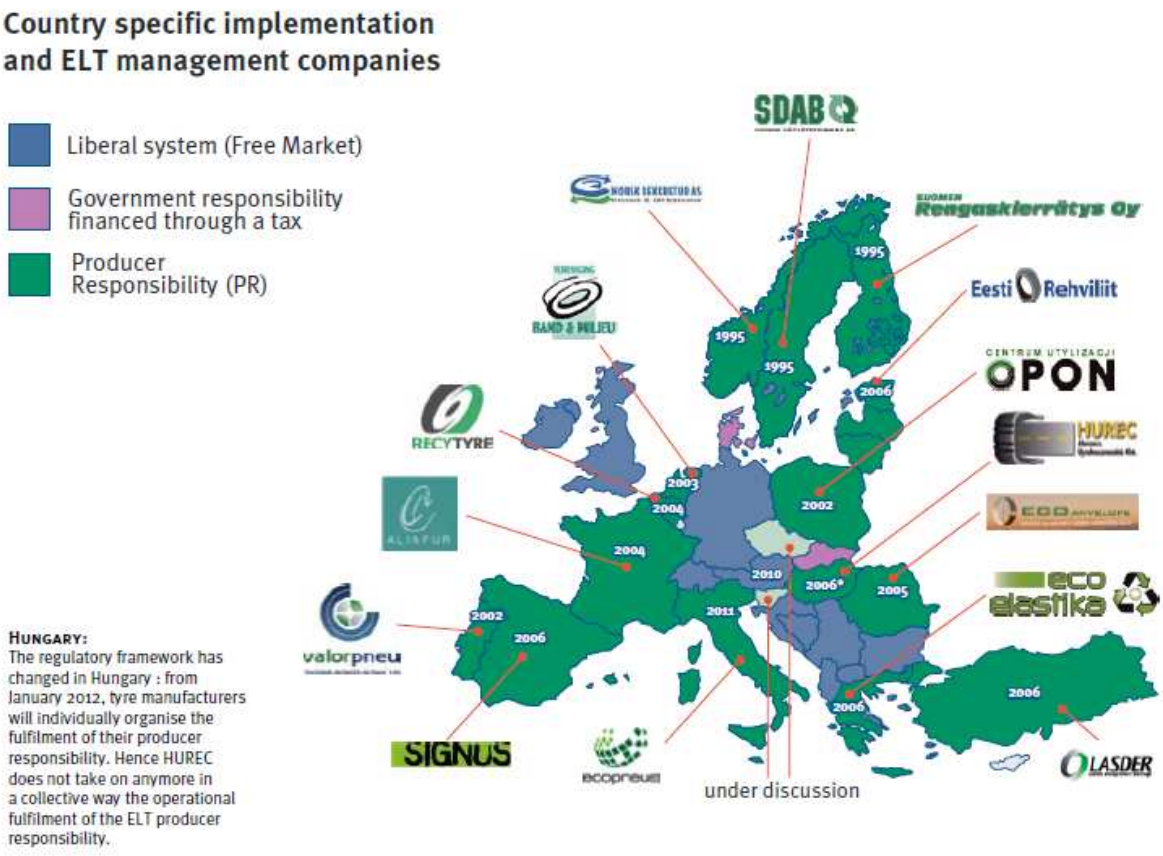


Figure 4: Country-specific implementation and ELT management companies[40]

- Turnover of PROs

According to the European Rubber and Tyre Manufacturers Association (ERTMA), the estimated annual cost of ELT management in Europe is 600 million EUR.[40] However, it is not clear what share of this amount PRIs represent.

2.5.2 Performance indicators

Countries where a PRI has been operating for over 10 years (e.g. Nordic countries) tend to have recovery rates of 100% and no stockpiles. There is still room for improvement in Ireland, at 91% recovery.

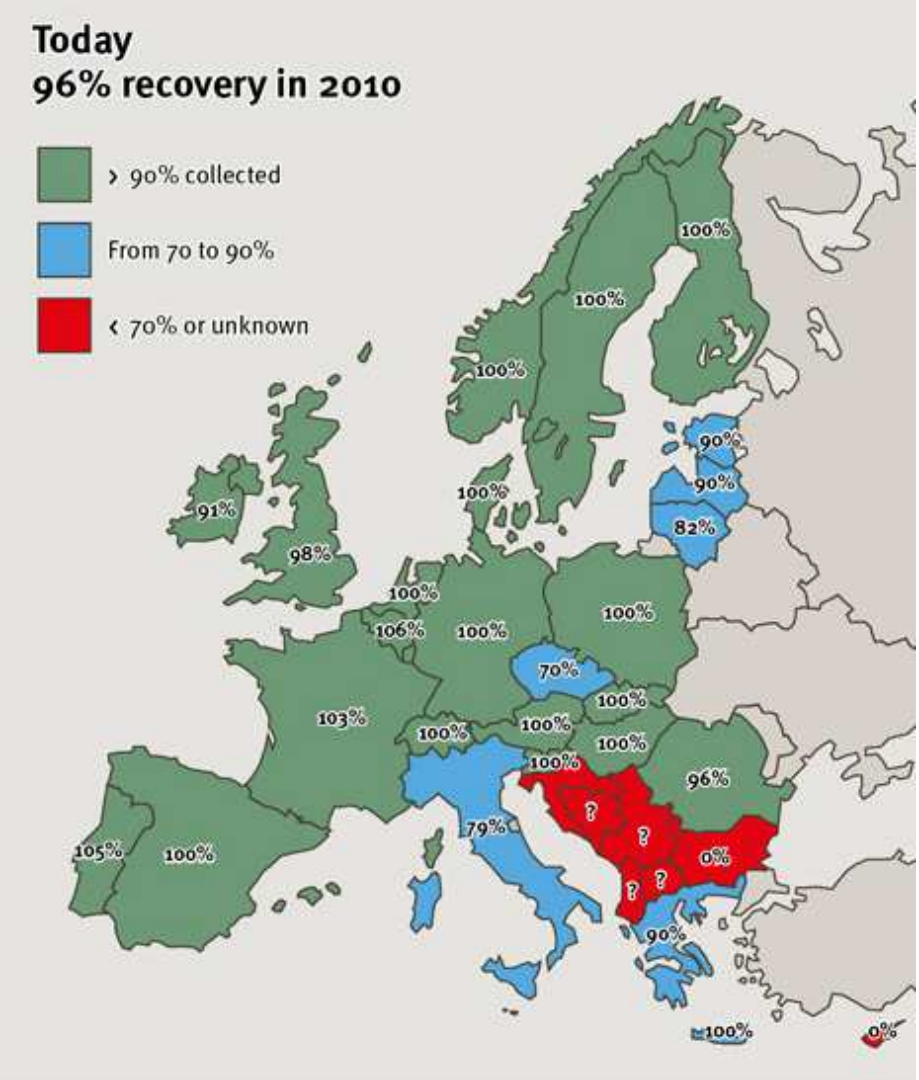


Figure 5: Tyre recovery rates by Member State, 2010[41]

[40] ETRMA (2011), *End of Life Tyres*, www.etrma.org.
[41] ETRMA (2011), *End of Life Tyres*, www.etrma.org.

2.5.3 Cost-effectiveness

Table 22 Cost-performance indicators by tyres PRI[42]

MS	PRO	Tyres removed (tonnes)	Collected (tonnes)	Recovered (tonnes)	Turnover (€m)	Cost (€m)	% administration
BE	Recyctyre	87 103 (2011)	86 416 (2011)	86 464 (2011)	27.1 (2011)	22.5 (2011)	
FI	Suomen Rengaskierrätykselle		49 138 (2011)	45 719 (2011)			
FR	Alliapur		297 699 (2011)		48.6 (2011)		
EL	Ecoelastika				4.4 (2011)	4.1 (2011)	€0.5m (2011)
IT	Ecopneus	426 000 (2011)	380 000 (2011)	280 000 (2011)			
PT	Valorpneu	78 881 (2011)	90 373 (2011)	93 367 (2011)			
ES	Signus	20 000 (2011)	177 234 (2011)	158 850 (2011)			

2.6 C&D

2.6.1 Performance indicators

Data for the C&D sector is generally not comparable due to the current lack of any statistical reporting at European level (Eurostat).[43] However, some indications on recycling and recovery rates of C&D exist, in particular from the European Environment Agency (EEA). EEA has collected information about recycling of C&D waste for 18 of 28 countries (EU-27 and Norway). Figure 6 shows total recycling of C&D waste per capita: countries with high generation of C&D waste per capita such as France, Germany and Ireland also have high recycling levels (about 2.0-3.5 tonnes per capita). Nonetheless, in Member States such as Austria, Belgium, Denmark, Estonia, the Netherlands and the UK, which have lower generation per capita, high recycling rates are also observed (about 0.5-1.5 tonnes.[44]

[42] Various sources including annual reports of PROs.
[43] Eurostat website: epp.eurostat.ec.europa.eu/portal/page/portal/waste/data/sectors/constructionanddemolition.
[44] EEA (2009) *EU as a Recycling Society: Present recycling levels of Municipal Waste and Construction & Demolition Waste in the EU, European Topic Centre on Resource and Waste Management*, http://scp.eionet.europa.eu/publications/wp2009_2/wp/WP2009_2.

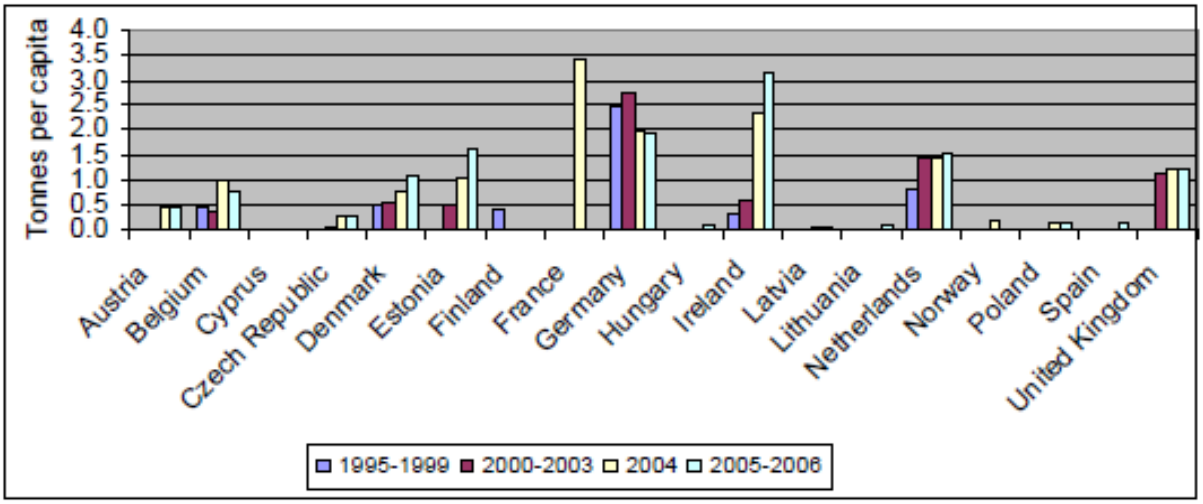


Figure 6: Recycling of C&D waste in the EU and Norway (tonnes per capita)[45]

Figure 7 indicates that the current recycling rate based on the amount generated varies considerably among Member States. In countries such as Norway, Denmark, Germany, Ireland and the Netherlands, the recycling rate for C&D is over 60%. On the other hand, the Czech Republic, Finland, Hungary and Poland only recycle between 15% and 30%.

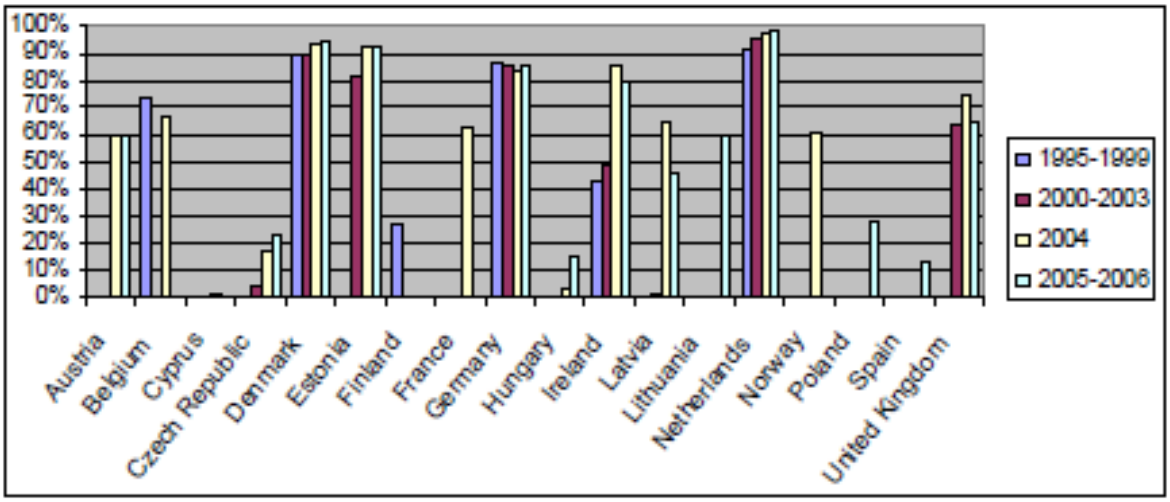


Figure 7: Recycling of C&D waste in the EU and Norway (% of amount generated)[46]

[45] Ibid. Data based on Eurostat data and ETC/RWM, 2008 based on national reports and statistics
[46] Ibid.

Annex 1: Fees charged to producers for registration to national WEEE/Batteries registers

Member State (Year of fee)[47]	Registration body	Classification of national registers	Fee charged to producers for registration	Type of registration fee
Austria[48]	Federal Environment Agency (Umweltbundesamt)	Public	No fees for registration.	N/A
Belgium	Wallonia - DGRNE (OWD), Flanders - OVAM and Brussels Capital - IBGE	Compliance scheme	There is currently no national registration for WEEE compliance. Administrative procedures related to the environment are dealt with by the three regional authorities[49].	N/A
Bulgaria*	Ministry of the Environment & Water, Department of Waste Management	Public	No register currently operating	N/A
Cyprus (2006)	Environmental Service	Public	No fees for registration.	N/A
Czech Republic	Ministry of Environment, Department of Waste Management	Public	No fees for registration.	N/A
Denmark (2012)	DPA-System	Private	1 000 DKK (€135): One-off registration fee 0.01 DKK (€0.001): Annual quantity-based fee per kilo 250 DKK (€34): Minimum fee 606 DKK (€81): Time-based fee for extraordinary administration	One-off fee and Annual

[47] If known or relevant.
[48] Okopol et al. (2007) *The Producer Responsibility Principle of the WEEE Directive Final Report*, ec.europa.eu/environment/waste/weee/pdf/final_rep_okopol.pdf.
[49] See www.weeeregistration.com/weee-registration/belgium.html.

Member State (Year of fee)[47]	Registration body	Classification of national registers	Fee charged to producers for registration	Type of registration fee
Estonia	Environment Information Centre	Public	No fees for registration.	N/A
Finland	Pirkanmaa Regional Environment Centre	Public	€440 - individual registration, one time €5 400 compliance scheme, one time €130/yr individual, yearly reporting €1 080/yr compliance scheme, yearly reporting	One-off fee
France (2012)	Ademe (French Environment and Energy Management Agency)	Public	No fees for registration.	N/A
Germany (2005)[50]	Foundation Elektro-Altgeraete Register (EAR)	Private	€155 - Basic registration per producer, first brand and first type of equipment €85 - Supplementation of the basic registration for every additional brand including one type of equipment and every additional type of equipment belonging to a brand €100 - Update of quantitative data on existing registrations per change session	Not known
Greece (2006)	EOEDSAP	Compliance scheme	There is no registration fee, but registration has to be accompanied by proof of the producer's registration with the only collective scheme in Greece	N/A
Hungary	National Environmental Inspectorate	Public	€300	One-off fee
Ireland (2012) [51]	**WEE Register Society**	**Private**	**Variable based on turnover €50 -€1 900**	**Yearly**
Lithuania	Ministry of Environment	Public	No fees for registration.	N/A
Luxembourg	Ministry of Environment	Public	No fees for registration.	N/A

[50] www.weeeregistration.com/weee-registration/Germany_ElektroGKostV_fee-list_en.pdf.
[51] www.weeeregister.ie/registration.html

Member State (Year of fee)[47]	Registration body	Classification of national registers	Fee charged to producers for registration	Type of registration fee
Netherlands	ICT Milieu and NVMP	Compliance scheme	No fees for registration.	N/A
Poland	Glowny Inspektorat Ochrony Srodowiska: Office of Chief Inspectorate for Environmental Protection	Public	Variable based on turnover €12 - €1 875	Not known
Portugal	Instituto Nacional de Residuos (Waste Institute)	Private	Variable based on turnover €375 - €1 500	Not known
Romania	Ministry of Environment and Water Management	Public	No fees for registration.	N/A
Slovakia	Ministry of Environment Waste management department	Public	No fees for registration.	N/A
Slovenia	Ministry of the Environment and Spatial Planning	Public	No fees for registration.	N/A
Spain	Ministry of Industry, Tourism and Trade	Public	No fees for registration.	N/A
Sweden	SEPA-Swedish Environmental Protection Agency	Public	€300	Yearly
UK	List of approved compliance schemes[52]	Compliance scheme	Variable based on turnover €30 - €445	Based on the compliance scheme

[52] www.environment-agency.gov.uk/static/documents/Business/12_11_02_Rpt_(Approved_schemes_list_2013).pdf.

Annex 2: Number of collection points for WEEE and Batteries

	Waste stream	PRO	Number of collection points/year
Austria (2009)	Batteries	Umweltforum Batterien (UB)	Nationwide there are 7 000 collection points (many of these are located at retail outlets)[53].
Belgium (2011)	WEEE	Recupel[54]	The collection network of Recupel relies on the following collection points: - all 520 container parks of Belgium (89 serviced directly, 444 serviced through regional trans-shipment stations) - 29 intermunicipal regional transshipment stations - 20 used goods centres acting as regional transshipment stations - 5 redistribution centres of retailers - Approximately 3 340 retailers[55]
Denmark (2011)	WEEE	Elretur[56]	Almost all WEEE in Denmark is collected through municipal "recycling centres". There are about 500 "recycling centres" in Denmark. The municipalities are responsible for the "recycling centres" while elretur's operators pick up and transport the WEEE from the centres to the treatment facilities.[57]
France (2011)	WEEE	Eco-systèmes[58]	The organisation Eco-systèmes first organised its collection system with retailers. This collection channel represents about 15 000 collection points (of which, 6 600 were active collection points in 2008). Eco-systèmes also collects from local authorities and municipalities that decide to implement selective collection and become a partner of Eco-systèmes (about 2 254 expected collection points in the long term were registered in 2010)[59]

[53] http://ec.europa.eu/environment/ecoap/about-eco-innovation/good-practices/eu/332_en.htm.
[54] Members represent about: 95% of the large household appliances market, 80% of small household appliances and consumer electronics market, and 60 % of the IT & Telecommunication equipment market
[55] www.weee-forum.org/system/files/member/recupel_factsheet.pdf
[56] The PRO represents a market share of around 85% with wide differences between the WEEE categories.
[57] www.weee-forum.org/system/files/member/elretur_dk_final.pdf
[58] The PRO covers nine of the ten categories of equipment listed in the European Directive, i.e. with the exception of WEEE category 5 - lighting equipment, and represents more than two-thirds of the French market.
[59] www.weee-forum.org/system/files/member/eco-systemes_2pager.pdf

	Waste stream	PRO	Number of collection points/year
Greece (2011)	WEEE	Appliances Recycling (members represents 90% of EE equipment marketed in Greece)	Appliances Recycling has signed contracts with 517 municipalities (about 4 082 collection points are operational already). Concerning retailers, there are 2 602 collection points. The total number of collection points is 8 504 (includes both municipal collection points and retailers).
Italy (2011)	WEEE	Ecodom[60]	WEEE has to be collected at all municipal collection sites that meet the criteria of a designated collection facility: there are approximately 3, 500 such sites across Italy[61]. The WEEE is divided into five groupings.
Netherlands (2010)	Batteries	Stibat	In 2010, there were approximately 22 000 collection points (most of these located in shops (17 171) and schools (4 821).[62]
Romania (2011)	WEEE	Ecotic	Collection of WEEE from municipal collection points and from retailers' collection infrastructure (85 containers), which is provided by the association[63].
Slovenia (2011)	WEEE/Batteries (2010)	ZEOS	ZEOS organises its collection system based on three types of collection points: - municipal collection points ("container parks") (70 collection points), - producer collection points run by waste management companies (50 collection points) and - distributor/retail collection points (more than 200 collection points).[64]
Sweden (2011)	WEEE (batteries since 2009)	El-Kretsen	Collection of WEEE at manned municipal recycling centres is the most common collection system. The nationwide collection system comprises about 1 000 collection points around the country (650 for households and 350 for businesses). In certain areas it is complemented with different types of kerb-side collection[65]. Retailer collection points are additional.
Switzerland (2011)	WEEE	SENS system	SENS services the following collection facilities through their logistics partners:

[60] Ecodom covers category 1 equipment (large household appliances including fridges, washing machines, cooking equipment, cooker hoods and water heaters) and currently represents about 65% of large household appliances sold annually in Italy. The WEEE are divided into five groups, determined by the treatment technology: (1) Cooling appliances and air conditioning (2) Other large domestic appliances (3) CRTs and monitors (4) Small domestic appliances, ICT equipment, lighting equipment, toys etc. (5) Lighting sources. Ecodom handles groups 1, 2 and 4.

[61] www.weee-forum.org/system/files/ecodom_factsheet_april_2011.pdf

[62] www.stibat.nl/data/sitemanagement/media/Annual%20report%202010.pdf.

[63] www.weee-forum.org/system/files/member/draft_2pager_ecotic_august_2009.pdf

[64] www.weee-forum.org/system/files/member/zeos_march_2011.pdf

[65] www.avfallsverige.se/fileadmin/uploads/elretur_eng.pdf.

	Waste stream	PRO	Number of collection points/year
			• 450 official SENS collection points including about 130 municipalities • 9 000 retailers, point-of-sales • Administrations and municipalities. • WEEE can also be directly delivered to accredited treatment partners.[66]
UK (2011)	WEEE	Repic[67]	WEEE is collected at all municipal collection sites that meet the criteria of a designated collection facility (DCF). There are currently over 1 600 DCFs across the UK, mainly local authority household recycling sites but some retail and other private collection points in the UK. Retailers were allowed to opt out of the requirement to take-back in-store in return for contributing to a fund which was then paid to local authorities to encourage them to participate[68]

[66] www.weee-forum.org/system/files/member/sens_two_pager_070710_e.pdf
[67] Represents around 50% of the weight and value of the electric and electronic equipment products sold annually in the UK
[68] www.weee-forum.org/system/files/member/info_repic_2pager__march_2011.pdf

Annex 3: Recovery/Recycling targets for Packaging, WEEE, ELV and Batteries

	Packaging	WEEE	ELV	Batteries
AT	Packaging, Green Dot Same recycling and recovery targets as in Packaging Directive	Same targets as in WEEE Directive	Same targets as in ELV Directive	
BE	Packaging, Green Dot 80% recycling and at least 90% recovery of the materials covered. **Minimum recycling levels by material (from 2010):** Glass: 60% (household and industrial) Paper/cardboard: 60% (household and industrial) Drink cartons: 60% (household and industrial) Metal: 50% (household and industrial) Plastic: 30% (household and industrial) Wood: 15% (industrial) **Minimum overall targets for recycling and recovery (from 2010):** Recycling: 80% (household), 80% (industrial) Recovery: 90% (household), 85% (industrial)	**Reuse and recycling of parts and materials:** Ferrous metals: 95% Non-ferrous metals: 95% Plastics: 50% Batteries: 65% **Recovery of parts and materials:** Plastics: 80% **Individual product categories, targets in weight %** **Reuse and recycling of parts and materials:** • large household equipment and fluorescent tubes: 80% • automates: 75% • other equipment: 70% **Recovery of parts and materials:** • large household equipment: 85% • automates: 80% • IT and telecommunications equipment: 75%	2006: 85% of ELVs treated to be recycled (80%) or recovered (5%) 2015: 95% recycling and 10% recovery	
BG	Packaging, Green Dot Recovery (2010): 48% Recycling (2010): 47%	Category 1. Large household equipment and Category 10. Automatic dispenser = 80% minimum recovery rate; 75% minimum reuse and recycling rate.	2011 = 90% (minimum reuse and recovery rate); 82% (minimum	

	Packaging	WEEE	ELV	Batteries
	Specific targets by material: 19% plastics, 51% glass, 60% paper, 50% metals, 15% timber.	Category 3. Computer and telecommunication equipment and Category 4. Consumer appliances = 75% minimum recovery rate; 65% minimum reuse and recycling rate. Category 2. Small household equipment, Category 5. Lighting equipment, Category 6. Electrical and electronic tools Category 7. Toys, leisure and sports equipment and Category 9. Monitoring and control equipment = 70% minimum recovery rate; 50% minimum reuse and recycling rate. Gas-discharge lamps = 80% minimum recovery rate; 80% minimum reuse and recycling rate.	reuse and recycling rate) 2012 = 91% (minimum reuse and recovery rate); 83% (minimum reuse and recycling rate) 2012 = 93% (minimum reuse and recovery rate); 84% (minimum reuse and recycling rate)	
CY	Green Dot From 2012: a) recover or incinerate with energy recovery at least 60% of the weight of packaging waste; b) recycle between 55% as a minimum and 80% as a maximum of the weight of the packaging waste, and c) recycle the following materials that are included in packaging waste: • 60% of the weight of glass • 60% of the weight for paper and cardboard • 50% of the weight of metal • 22.5% of the weight of plastic, taking into consideration material that can be recycled into plastic • 15% of the weight of wood. Transposition deadline: 31 December 2012	Recovery target: at least 4 kg of electronic and electrical equipment per capita annually (about 3 000 t/y) Same recycling and reuse targets as in WEEE Directive.	Same targets as in ELV Directive	25% recycling of portable batteries put on the Market until 26 September 2012. 45% recycling of portable batteries put on the Market until 26 September 2016. Same recycling targets as in Batteries Directive

	Packaging	WEEE	ELV	Batteries
CZ	Transposition deadline: 31 December 2012		Same targets as in ELV Directive	
DK	<u>Packaging, Deposit Refund</u> 95% recovery by 1 January 2005	Producers, importers or any person responsible for management of WEEE shall ensure that the following rates of reuse or recycling are met: • Minimum of 75% of equipment falling under categories 1 and 10 of WEEE Directive; • Minimum of 65% of equipment falling under categories 3 and 4; • Minimum of 50% of equipment falling under categories • Minimum of 80% of waste gas discharge lamps.	Reduce the amount of ELV waste landfilled in Denmark from 20% to 5%.	
EE	<u>Deposit Refund</u> Recovery targets for all packaging placed on the market and deposit system for one-way and multi-use packaging of beer, alcohol drinks with low ethanol content and soft drinks in glass, plastic and metal packaging: • 50% by 2004 • 60% by 2010 <u>Packaging, Green Dot</u> 2004-2010: collection and recovery of 50% of total packaging put on the market by packaging operator (packer and importer) 2012: Compliance with EU norms Transposition deadline: 31 December 2012			
FI	<u>Packaging, deposit refunds</u>	Same targets as in WEEE Directive	Same targets as in	Same targets as in

	Packaging	WEEE	ELV	Batteries
	Recovery and reuse target (drink containers): 90% Recycling target (metal drink containers): 90% Recovery for recycling target (disposable drink containers): 80% Packaging and packaging waste Same targets as in Packaging Directive		ELV Directive	Batteries Directive
FR	Packaging, Green Dot No collection target. Recycling target 55% (2008); 75% (2012).	Collection target: 6 kg/capita/year for household WEEE (2010); +1kg/capita/year by 2014. No target specified for professional WEEE. Recycling rate varies, 50%, 65% or 75% depending on category; recovery rate 70%, 75% or 80%.	Implicit collection target: 100% Reuse and recycling target: 80% (2006); 85% (2015). Reuse and recovery target: 85% (2006); 95% (2015).	Collection targets: 25% (2012); 45% (2016) Minimum recycling rate: 50%, 65% or 75% of average weight, depending on type
DE	Green Dot 65% weight must be recovered 55% weight must be recycled Specific recycling targets apply to different materials: Wood: 15% Synthetics: 22.5% Metals: 50% Glass/Paper/Card: 60%	Collection of 4 kg of WEEE per year/ capita. Recovery targets: 70-80% according to WEEE type; Recycling targets: 50-80% according to WEEE type.	Reuse and recovery targets (2006): 85% Reuse and recycling: 80%	All established take-back systems must achieve a collection rate of 35% by 2012 and of 45% by 2016

	Packaging	WEEE	ELV	Batteries
GR		Minimum recovery target: 70-80% by an average weight per appliance. The exact rate depends on the category of electronic equipment.	By 1 January 2015 minimum reuse and recovery rate: 95% by an average weight per vehicle and year	
HU	Green Dot Same targets as in Packaging Directive Transposition deadline: 31 December 2012			
IE	**Packaging, deposit refunds** **Minimum return target: 85% of all beverage containers.** **Packaging, Green Dot** **Recover and recycle a total of 60% of all packaging placed on the market by the end of 2008**	**Collection target: 4kg/per capita/per year**	**Reuse and recovery rate (from 2006): 85% by average weight per vehicle deposited for appropriate treatment (to include 80% materials recycling); 95% reuse and recovery by 1 January 2015 (to include 85% materials recycling).**	**Minimum collection target for producers:** **25% by 26 September 2012, and 45% by 26 September 2016, of the quantity by type of portable battery placed on the market.**
IT	Packaging, Green Dot Recovery target: at least 60% are recovered, of which 55-80% are recycled, for the following streams: glass: 60%,	Targets for WEEE falling under categories 1 and 10 Annex I of WEEE Directive: minimum 80% recovery and 75% reuse and recycling; Targets for WEEE falling under categories 3 and 4 Annex I: minimum 75% recovery and 65% reuse and	Same targets as in ELV Directive	Same targets as in Batteries Directive

	Packaging	WEEE	ELV	Batteries
	paper and card: 60%, metals: 50%, plastics (plastics part only): 26%, wood: 35%.	recycling; Targets for WEEE falling under categories 2, 5, 6, 7 and 9 of Annex IA: 70% recovery, of which 50% are recycled and reused; For all gas discharge lamps, the rate of component, material and substance reuse and recycling shall be a minimum of 80% by weight of the lamps.		
LV	Packaging, packaging waste Same as determined in the Packaging Directive for Latvia. Transposition deadline: 31 December 2015	Collection target for large household equipment (except for large refrigeration equipment, cold storage depots and refrigerators): 25%; 80% treatment target. Collection target for large refrigeration equipment, cold storage depots and refrigerators: 25%; 80% treatment target Collection target for small household equipment: 25%; 70% treatment target. Collection target for IT and electronic communication equipment (except for monitors and mobile phones): 25%; 75% treatment target Collection target for monitors: 25%; 75% treatment target Collection target for mobile phones: 25%; 75% treatment target Collection target for equipment provided for wide consumption (except for television sets): 25%; 75% treatment target Collection target for television sets: 25%; 75% treatment target Collection target for electrical and electronic	Implicit 100% recovery and treatment target.	Collection target for lead-acid batteries and accumulators: 25%; 65% treatment target Collection target for nickel-cadmium batteries and accumulators:25%; 75% treatment target Collection target for other types of waste batteries and accumulators: 25%; 50% treatment target.

	Packaging	WEEE	ELV	Batteries
		instruments (except for large fixed production machinery which is not portable or is permanently fixed): 25%; 70% treatment target Collection target for light bulbs containing mercury: 50%; 70% treatment target Collection target for lighting installation (except for light bulbs containing mercury): 25%; 70% treatment target Collection target for monitoring and control tools: 25%; 70% treatment target Collection target for toys, sport and recreation inventory: 25%; 70% treatment target Collection target for medical devices (except for implanted and contaminated medical devices): 25%; 70% treatment target Collection target for automatic vending machines: 25%; 80% treatment target.		
LT	<u>Packaging, deposit refund</u> Return target (2007-2009): 80% Return target (2010-2012): 85% Transposition deadline: 31 December 2012	WEEE collection target: 44-56% (by weight of EEE placed on the market)		Recovery and recycling target: 80% (expressed as a % of the weight of batteries and accumulators placed on the market)
LU		Same targets as in the WEEE Directive	Minimum recovery target (to be met by 1 January 2015): 95% of the average weight	Minimum collection target: - 2012: 25% - 2016: 45%

	Packaging	WEEE	ELV	Batteries
			per vehicle per year Minimum reuse and recycling target: 85% of the average weight per vehicle per year	From 2011 minimum recycling targets: • 65% of the average weight of lead-acid batteries and accumulators • 75% of the average weight of nickel-cadmium batteries and accumulators • 50% of the average weight of other waste batteries and accumulators .
MT	Packaging, Green Dot Recovery target: minimum 51% and maximum 65% of all packaging material put on the market. Recycling target: minimum 21% and maximum 45% of packaging material put on the market. Minimum targets per material by weight: - Glass: 60% - Metal: 50%		Same targets as in ELV Directive	Same targets as in Batteries Directive

	Packaging	WEEE	ELV	Batteries
	- Plastic: 15% - Paper and cardboard: 65%. Transposition deadline: 31 December 2013			
NL	Packaging, Green Dot Producer reuse target (as a material or fuel source): 75% of the total quantity of packaging by weight; 70% reused as a material. Producer collection and reuse targets by packaging category: - Plastic drinks packaging (larger than 500 ml): minimum 95% - Plastic drinks packaging (smaller than 500 ml): minimum 55% - Remaining plastic packaging: minimum 45% will be reused (as a material or fuel source); minimum 27% by weight will be reused as a material Other material types – minimum reuse rates by weight: - Glass packaging: 90% - Paper and card packaging: 75% - Metal packaging: 85% - Wood packaging: 25%.	For different equipment by categories defined in Annex IA of the WEEE Directive (2006): - minimum recovery target: 70-80% by an average weight per appliance, and - minimum reuse and recycling target: 50-75% by an average weight per appliance; For gas discharge lamps, the rate of component, material and substance reuse and recycling shall be minimum 80% by weight of the lamps.	Same targets as in ELV Directive	
PL	Packaging, Green Dot Same targets as in Packaging Directive Transposition deadline: 31 December 2014	Minimum recovery target: 24% (40% for lighting equipment)	Same targets as in ELV Directive	Same targets as in Batteries Directive
PT	Packaging, Green Dot	WEE Collection target (2006): 4 kg/ capita/ year from	Targets to be met by	Producers collection

	Packaging	WEEE	ELV	Batteries
	Targets to be met by 2011: • Recovery: 60% of the total weight of packaging waste placed on the market • Recycle: minimum 55% of this waste - Minimum recycling target by material: - Glass: 60% - Paper and cardboard: 60% - Metal: 50% - Plastic: 22.5% - Wood: 15%	domestic users	2015: - Minimum reuse and recovery target of 95% by an average weight per vehicle and year; - Minimum reuse and recycling target of 85% by an average weight per vehicle and year	targets: - 25% (by 2011), - 45% (by 2015)
RO	<u>Packaging, Green Dot</u> Same targets as in Packaging Directive	Same targets as in the WEEE Directive		
SE	<u>Packaging, Deposit Refund</u> Minimum recycling target: Aluminium cans: 90%, PET containers: 90%.			
SK	Transposition deadline: 31 December 2012			
SI	<u>Packaging, Green Dot</u> Targets to be met by 2012: - Recovery or incineration: minimum 60% by weight - Recycling: minimum 55% and maximum 80% by weight. Minimum recycling targets for materials contained in		Reuse and recycling target (2008): 87.64% Reuse and recovery target (2008): 89.67%	

	Packaging	WEEE	ELV	Batteries
	packaging: - Paper and board: 60% by weight, - Wood: 15% by weight, - Glass: 60% by weight, - Metal: 50% by weight, - Plastics, counting exclusively material that is recycled back into plastics): 22.5% Transposition deadline: 31 December 2012			
ES	<u>Packaging, Deposit Refund</u> Recovery target: between 50-65%, of which 25-45% is to be recycled.			
UK	<u>Packaging, Green Dot</u> Same targets as in Packaging Directive		Reuse, recycling and recovery target: 85% (due to rise to 95% from 2015).	2012: 25% of all batteries placed on the market by producer responsibility scheme members have to be collected and recycled to the required standards depending on chemistry. From 2016, the target rises to 45%.

Annex 4: List of PROs by stream and Member State

MS	Organisation	Website
Packaging		
Austria	Altstoff Recycling Austria (ARA)	www.ara.at/index.php?id=129
Belgium	Fost Plus	www.fostplus.be/Pages/default.aspx
	Val-I-Pac	www.valipac.be/Belgium/
Bulgaria	EcoPack Bulgaria	www.ecopack.bg/en/index.php
Cyprus	Green Dot Cyprus	http://greendot.com.cy/greendot-intro
Czech Republic	EKO-KOM	www.ekokom.cz/
Denmark	Dansk Retursystem (DRS)	
Estonia	Eesti Taaskasutusorganisatsioon	www.eto.ee/?setlang=eng
	Eesti Pandipakend	
Finland	Environmental Register of Packaging PYR	www.pyr.fi/eng/index.html
France	Eco-Emballages	http://ecoemballages.fr/
	Adelphe	www.adelphe.fr
	Cyclamed	www.cyclamed.org
Germany	DSD	
	Interseroh	www.interseroh.com/
	Belland Vision	www.bellandvision.de/home.htm
	Eko-Punkt	www.eko-punkt.de
	Der Grüne Punkt	www.gruener-punkt.de/?L=1
Greece	Hellenic Recovery Recycling Corporation	www.herrco.gr/default.asp?langID=2
Hungary	ÖKO-Pannon	www.okopannon.hu/
Ireland	Repak	www.repak.ie/
Italy	CONAI	www.conai.org/
Latvia	Latvijas Zaļais punkts	www.zalais.lv/en/
Lithuania	Žaliasis taškas	www.zaliasistaskas.lt/
Luxembourg	VALORLUX	www.valorlux.lu/

MS	Organisation	Website
Malta	GreenPak	www.greenpak.com.mt/current-members/290-lidl-malta-ltd
Netherlands	Nedvang	www.nedvang.nl/
Poland	Rekopol Organizacja Odzysku	www.reba.com.pl/node?id=224
Portugal	Sociedade Ponto Verde	www.pontoverde.pt/index.html
Romania	ECO - ROM AMBALAJE	www.ecoromambalaje.ro/
	Interseroh	
	Ecologic 3 R	
	SOTA GRUP 21	
	ECO-X	
Sweden	FTI (Förpacknings- och Tidningsinsamlingen)	www.ftiab.se
	Svenska Returpack(-Pet)	
	Svenska Returglas 50-Cl	
Slovakia	Envi-Pak	www.envipak.sk
Slovenia	Slopak	www.slopak.si/
	Interseroh	www.interseroh-slo.si/si/
	EKODIN	
	SUROVINA	
Spain	ECOEMBALAJES ESPAÑA (ECOEMBES)	www.ecoembes.com/en/Pages/portada.aspx
	ECOVIDRIO	
UK	Valpak	www.valpak.co.uk/Home.aspx
	REPIC	www.repic.co.uk/
WEEE		
Austria	Umweltforum Haushalt (UFH)	www.ufh.at/
	Erfassen und Verwerten von Altstoffen GmbH (EVA)	
	Elektro Recycling Austria (ERA)	
	ERP	www.erp-recycling.org/home
Bulgaria	Ecobultech	www.ecobultex.com
	ELTECH Resource	

MS	Organisation	Website
Belgium	Recupel	www.recupel.be
Cyprus	Electro Cyclosis	www.electrocyclosis.com.cy
Czech Republic	Asekol	www.asekol.cz
	Elektrowin	www.elektrowin.cz/
	Retela	www.retela.cz/
Denmark	Elretur	www.elretur.dk/
	DPA-System (Danish Manufacturer Liability System)	www.dpa-system.dk
	ERP	www.erp-recycling.org/home
Finland	ERP	www.erp-recycling.org/home
France	Ecosystèmes	www.eco-systemes.fr
	Ecologic	www.ecologic-france.com/
	Recyclum	www.recyclum.com
	OCAD3E (certified co-ordination body)	
	ERP	www.erp-recycling.fr
Germany	Lightcycle	www.lightcycle.de/
	Stiftung Elektro-Altgeräte Register (EAR)	www.stiftung-ear.de
	ERP	www.erp-recycling.org/home
Greece	Appliances Recycling s.a.	www.electrocycle.gr
	Fotokiklosi s.a.	www.fotokiklosi.gr
Ireland	WEEE Ireland	www.weeeireland.ie/
	ERP	www.erp-recycling.org/home
Italy	Ecodom	www.ecodom.it
	Ecoped	www.ecoped.org
	Ecor'it	www.ecorit.it
	RAE Cycle	www.raecycle.it
	ReMedia	www.consorzioremedia.it/
	ERP	www.erp-recycling.org/home
Latvia	Latvijas Zaļais punkts	www.zalais.lv/en/
Lithuania	EPA	www.epa.lt

MS	Organisation	Website
Luxembourg	Ecotrel	www.ecotrel.lu
Netherlands	ICT Milieu	www.ictoffice.nl/
	Wecycle	www.wecycle.nl
Poland	ElektroEko	www.elektroeko.pl/
	ERP	www.erp-recycling.org/home
Portugal	Amb3e	www.amb3e.pt
	ERP	www.erp-recycling.org/home
Romania	Ecotic	www.ecotic.ro/
	RoRec	www.rorec.ro/
Sweden	El-Kretsen	www.el-kretsen.se/
Slovakia	Envidom	http://envidom.sk/
	Slovak Electronic Waste Agency (SEWA)	www.sewa.sk/
Slovenia	ZEOS	www.zeos.si/
	Slopa	www.slopak.si/
	Interseroh	www.interseroh-slo.si/si/
Spain	Eco Raee's	www.eco-raee.com/
	EcoAsimelec	www.ecoasimelec.es/
	EcoFimaticia	www.ecofimatica.es
	Ecolec Fundacion	www.ecolec.es
	Ecotic Fundacion	www.ecotic.es
	ERP	www.erp-recycling.org/home
UK	WEEE Care	www.wastecare.co.uk/compliance-services/weeecare/
	Veolia WEEE PCS	www.veoliaenvironmentalservices.co.uk
	Lumicom	www.lumicom.co.uk
	ERP	www.erp-recycling.org/home
	REPIC	www.repic.co.uk/
	Valpak	
Batteries		
Austria	Umweltforum Haushalt (UFH)	www.ufh.at/

MS	Organisation	Website
	Erfassen und Verwerten von Altstoffen GmbH (EVA)	
	Elektro Recycling Austria (ERA)	
	ERP	www.erp-recycling.org/home
Belgium	BEBAT	www.bebat.be/
Bulgaria	Ekobulbattery	http://ecobulbattery.com
	Monbat Montana	
	KCM Plovdiv	
	LZC Kardzhali	
Cyprus	AFIS Cyprus	www.afiscyprus.com.cy
Denmark	ERP	www.erp-recycling.org/home
	DPA-System (Danish Manufacturer Liability System)	www.dpa-system.dk
Finland	ERP	www.erp-recycling.org/home
France	Screlec	www.screlec.fr/accueil
	Corépile	www.corepile.fr
Germany	GRS Batterien	www.grs-batterien.de/
	ERP	www.erp-recycling.org/home
Ireland	ERP	www.erp-recycling.org/home
	WEEE Ireland	
Italy	ERP	www.erp-recycling.org/home
	COMBAT	www.cobat.it
Latvia	Latvijas Zaļais punkts	www.zalais.lv/en/
Luxembourg	Ecobatterien	www.ecobatterien.lu
Netherlands	Wecycle	www.wecycle.nl
Poland	ERP	www.erp-recycling.org/home
Portugal	Valorcar	www.valorcar.pt/
	GVB	
	Ecopilhas	www.ecopilhas.pt/
	ERP	www.erp-recycling.org/home
Romania	RoRec	www.rorec.ro/

MS	Organisation	Website
Slovenia	ZEOS	www.zeos.si/
	Slopak	www.slopak.si/
	Interseroh	www.interseroh-slo.si/si/
Spain	ERP	www.erp-recycling.org/home
UK	BatteryBack	www.batteryback.org
	Budget Pack	www.budget-pack.com
	CCR REBAT	www2.ccruk.co.uk
	ERP UK Ltd	www.erp-batteries.co.uk/
	REPIC	www.repic.co.uk/
ELV		
Austria	ÖCAR Automobilrecycling	www.oecar.at/
Belgium	Febelauto	www.febelauto.be
Bulgaria	Avtoecobul	http://avtoecobul.com
Denmark	Dansk Autogenbrug	www.autogenbrug.dk/
Estonia	Mittetulundusühing ELV	www.elv.ee/
Finland	Suomen Autopurkamoliitto ry	www.autopurkamoliitto.fi/
France	Conseil National des Professions de L'Automobile, Branche Demolisseurs (No PRI)	www.cnpa.fr
Greece	Alternative Management of Vehicles	www.edoe.gr
Hungary	Gépjármubontók Országos Egyesülete	www.goe.hu/
Netherlands	Auto Recycling Nederland	www.arn.nl
Poland	Car Recycling Forum - FORS	www.fors.pl/
Portugal	Valorcar	www.valorcar.pt
Sweden	Sveriges Bilskrotares Riksförbund	http://sbrservice.se/
UK	Autogreen	www.rewardingrecycling.co.uk/
	MVDA	www.mvda.org.uk
Tyres		
Belgium	Recytyre	www.recytyre.be
Estonia	MTÜ Eesti Rehviliit	www.rehviliit.ee/web2/

MS	Organisation	Website
Finland	Suomen Rengaskierrätykselle	www.rengaskierratys.com
France	Alliapur	www.aliapur.fr/
Greece	Ecoelastika	www.ecoelastika.gr/
Hungary	Hurec	www.hurec.hu/
Italy	Ecopneus	www.ecopneus.it/
Netherlands	Band en Milieu	www.recybem.nl/
Poland	Centrum Utylizacji Opon	www.utylizacjaopon.pl/en/
Portugal	Valorpneu	www.valorpneu.pt/
Romania	Eco Anvelope	www.ecoanvelope.ro/
Sweden	SDAB	www.svdab.se
Spain	Signus	www.signus.es/
C&D		
Germany	National and local voluntary agreements	
Farm plastics		
UK	Farm Plastics Recycled	www.farmplasticsrecycled.co.uk
	Solway Recycling	www.solwayrecycling.co.uk/
	Birch Farm Plastics	www.birchfarmplastics.co.uk
	Agricultural Waste Plastics	www.agwasteplastics.org.uk/

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APPENDIX D: COMPETITION IN EXTENDED PRODUCER RESPONSIBILITY SCHEMES

Comhshaol, Pobal agus Rialtas Áitiúil
Environment, Community and Local Government

Review of the Producer Responsibility Initiative Model in Ireland

Annex to the Main Report

Competition in Extended Producer Responsibility Schemes (Redacted)

By Paul K Gorecki,
Economic and Social Research Institute
and Department of Economics,
Trinity College Dublin

RPS ESRI bio Intelligence Service PHILIP LEE SOLICITORS

Competition in Extended Producer Responsibility Schemes

Paul K Gorecki[*]

Economic and Social Research Institute

Trinity College Dublin

20 March 2014

[Redacted]

Contents

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EXECUTIVE SUMMARY

The object of this paper is to address the role of competition in securing a more efficient and effective collection, sorting and recovery of waste streams such as WEEE, packaging, batteries and so on, so as to improve the competitive position of firms and business that need to pay for such services, while at the same time meeting binding EU environmental targets. Success should not only contribute to the success of such firms through lower input costs but also generate extra jobs and investment. The vehicle through which collection, sorting and recovery of waste takes place is a producer responsibility organisation or PRO. It acts on behalf of individual firms in the collection, sorting and recovering waste as well as meeting the targets and in return the PRO charges a membership fee based on tonnage of waste. In most markets more competition is associated, albeit crudely, with the number of providers. Hence, as a first approximation, it could be argued more PROs should lead to more competition. Environmental targets are met with lower costs of collection, sorting and recovery. A win-win situation. We consider this view to be mistaken. This conclusion was reached only after a careful examination of the economics of the supply of collection, sorting and recovery services supplied through a PRO. It is unlikely that licensing more PROs with a national remit will lead to better outcomes in terms of cost. Instead, costs are likely to be higher while the increased difficulty of monitoring the PROs is likely to make reaching the targets more difficult. This does not mean that competition cannot be used to create lower collection, sorting and recovery costs, through, for example, tendering. When market conditions suggest that only one national PRO is appropriate then competition for the market is appropriate. Where market conditions suggest that multiple exclusive geographic markets, usually two, are appropriate, then competition is possible. What needs to be done is create mechanisms to ensure competition takes place, while at the same time retaining the advantages of having a single firm responsible for meeting targets as well as responsibility for collection, sorting and recovery.

1. Introduction

The purpose of this paper is consider the role of competition in Extended Producer Responsibility (EPR) compliance schemes in terms of minimising the cost of achieving certain environmental regulatory outcomes, which are often expressed in terms of targets for reduction, reuse, and recycling of specified waste streams. The concept of EPR has been defined by the OECD as follows:

> Extended Producer Responsibility is a concept where manufacturers and importers of products should bear a significant degree of responsibility for the environmental impacts of their products throughout the product life-cycle, including upstream impacts inherent in the selection of materials for the products, impacts from manufacturers' production process itself, and downstream impacts from the use and disposal of the products. Producers accept their responsibility when designing their products to minimise life-cycle environmental impacts, and when accepting legal, physical or socio-economic responsibility for environmental impacts that cannot be eliminated by design.[1]

At the European Union (EU) level Article 8 of the Waste Directive sets of a definition of EPR in legislative terms (Box 1).[2]

The cost of meeting the desired environmental outcomes is an input cost for producers involved in a particular waste stream. Minimising the cost of meeting the environmental outcomes will have knock-on effects in terms of the producer's ability to compete against producers located in other EU Member States, particularly those within the euro zone area,[3] that are also required to meet the same EU-wide environmental targets. For example, if the costs of compliance were higher in Ireland this could place businesses located in Ireland at a competitive disadvantage, resulting in job losses and discouraging investment.

There are presently EPR arrangements in Ireland covering six waste streams: waste electrical and electronic equipment (WEEE); batteries; packaging; farm plastics; end of life vehicles (ELV); and tyres. A seventh, construction and demolition, is under consideration (DoECLG, 2012a, pp. 19-20). In all existing EPR compliance schemes, except ELV, producers have the choice of meeting the environmental outcomes specified in legislation governing a particular waste stream either through membership in a Producer Responsibility Organisation (PRO), which acts collectively on behalf of producers, or self-complying on an individual basis. The lack of choice for ELVs reflects the fact that ELV producers were unable to agree on a PRO in 2006 when the relevant EU directive was transposed into Irish legislation.[4] However, the producers' trade association, the Society of the Irish Motor Industry (SIMI) stated in 2012 that it had recently "submitted [to the Department of the Environment, Community and Local Government] the possibility of introducing a group compliance scheme" (SIMI, 2012, n.p.), a position which was endorsed by the current review of the ELV (RPS,

[1] http://www.oecd.org/document/19/0,3746,en_2649_34281_35158227_1_1_1_1,00.html. This OECD webpage contains a guide to the extensive work that the organisation has done in the area of EPR. Accessed 26 July 2012.
[2] Other Articles in the Waste Directive elaborate on EPR, such as Articles 14 and 15.
[3] In the euro zone it is not possible for a member to offset higher costs of compliance through variations in the exchange rate since the euro zone is a currency union.
[4] S.I. No. 282 of 2006, Waste Management (End-of-Life-Vehicles) Regulations 2006.

2013b, p.46, p. 53). Achieving the desired environmental outcomes is usually part of the mandate of the PRO. The exception is the EPR for tyres which is primarily concerned with tracking the movement of tyres through production, distribution, use and disposal, although the current review of the regulatory regime for tyres has recommended a move towards a compliance scheme (RPS, 2013a). Hence, for different reasons, ELV and tyres are, at present, exceptions from the conventional EPR model.

Box 1: Article 8 of the Waste Directive: Extended Producer Responsibility

1. In order to strengthen the re-use and the prevention, recycling and other recovery of waste, Member States may take legislative or non-legislative measures to ensure that any natural or legal person who professionally develops, manufactures, processes, treats, sells or imports products (producer of the product) has extended producer responsibility.

   Such measures may include an acceptance of returned products and of the waste that remains after those products have been used, as well as the subsequent management of the waste and financial responsibility for such activities. These measures may include the obligation to provide publicly available information as to the extent to which the product is re-usable and recyclable.

2. Member States may take appropriate measures to encourage the design of products in order to reduce their environmental impacts and the generation of waste in the course of the production and subsequent use of products, and in order to ensure that the recovery and disposal of products that have become waste take place in accordance with Articles 4 and 13.

   Such measures may encourage, inter alia, the development, production and marketing of products that are suitable for multiple use, that are technically durable and that are, after having become waste, suitable for proper and safe recovery and environmentally compatible disposal.

3. When applying extended producer responsibility, Member States shall take into account the technical feasibility and economic viability and the overall environmental, human health and social impacts, respecting the need to ensure a proper functioning internal market.

4. The extended producer responsibility shall be applied without prejudice to the responsibility for waste management … and without prejudice to the existing waste stream specific and product specific legislation.

Source: EU (2008).

In most cases PROs are not-for-profit organisations[5] and often producer led. European Recycling Platform Ireland (ERP) was founded by Braun GmbH, the Electroulx Group, HP and Sony,[6] while WEEE Ireland was founded by 20 firms including Dimpco, JVC and Apple.[7] Most PROs were formed since the mid-1990s, reflecting legislative developments designed to facilitate the formation of PROs to meet environmental targets.[8]

[5] This applies not only to Ireland, but other Member States (EC, 2005, p. 14).
[6] http://www.erp-recycling.ie/index.php?content=83. Accessed 22 July 2012.
[7] http://www.weeeireland.ie/about_founding_members.htm. Accessed 27 July 2012.
[8] The alternative mechanism to achieve these targets was environmental taxes. However, 24 of the EU-27 employed the EPR option. See, for example, Watkins *et al.* (2012, Table 7, p. 104).

The requirements and choices (i.e. self comply vs. joining a PRO) by which a producer fulfils the specified environmental outcomes are set in legislation, typically a statutory instrument. The latter also contains details of the desired environmental outcomes in terms of targets, collecting information and so on. The targets are frequently EU-mandated. The Minister for the Environment, Community and Local Government (the Minister) is responsible for approving PROs or in legislative parlance, an approved body. The legislation typically lists a series of documents that must form part of the application to be a PRO such as those relating to governance and membership rules, a declaration that the PRO will not discriminate against any producer on the grounds of its size or location, while the PRO agrees to co-operate with other PROs to achieve the environmental targets.

The Minister in approving a PRO may specify conditions across virtually all aspects of a PRO, including the obligation to meet certain specified targets, composition of the board of management, representativeness of the directors, amount to be spent on awareness and approval of amendments, to articles of association, corporate governance rules and rules of membership. If a producer joins the PRO and participates satisfactorily, rather than self comply, then the producer is exempt from certain reporting, registration with local authorities and other requirements. The PRO undertakes these activities on behalf of the producer. If, on the other hand, the producer decides to self comply then certain information and documentation needs to be provided to the local authority, including an implementation plan to meet the environmental targets in the legislation. The legislation typically allows for the possibility of more than one PRO since there is reference to co-operation between PROs to meet targets. However, no criteria specify when more than one PRO should be permitted either in legislation or in terms of DoECLG guidance.

In this paper we consider the issue of whether or not greater competition can or should be injected into the provision of PRO services. This might help reduce costs, while at the same time meeting the environmental targets specified in the legislation and in the Ministerial approval of an application to be a PRO. Now is an appropriate time with a record of PRO(s) operation in five waste streams for several years, an outstanding application for a second PRO for packaging, the possibility of an EPR for construction and demolition (which might include a PRO) as well as a PRO for ELV.

The paper is divided into six sections, including the introduction. The background of the paper is set out in Section 2, while Section 3 discusses the economics of PROs by analysing the primary functions that it undertakes, both for the State and its commercial customers or members. It is important to have this understanding in order to appreciate the degree to which competition might be introduced and, if so, how. Attention then turns in Section 4 to the issue of the scope for competition among rival PROs operating in the same waste stream. Section 5 addresses the four questions raised in the terms of reference which are set out in Section 3. Section 6 concludes. A glossary of the acronyms used in this paper is presented in Annex A.

2. Background: Mandate and Policy Context

The Department of the Environment, Community and Local Government (DoECLG, 2012a), in the terms of reference for the Review of the Producer Responsibility Initiative Model in Ireland identified under the heading 'Competition,' the following mandate in respect of EPR compliance schemes and competition:

> A central focus of the current Programme for Government is to create jobs and improve the competitive environment for business in Ireland. Accordingly, there is a need to ensure that the optimal competitive environment is provided for [EPR] compliances schemes. Therefore, an examination across all of the waste streams is required as to whether the current arrangements are inhibiting competition and if so, recommendations should be provided as to how this situation can be improved. In terms of ensuring competition among compliance schemes, and in particular lowest compliance costs for businesses consistent with the achievement of the environmental outcomes required, recommendations are also required on the optimum numbers of compliance schemes that could maximise operational efficiencies in each waste stream.
>
> In analysing the overall nature of the competitive aspects of the market for compliance schemes, it will be necessary, as set out above, to review the existing geographic division for the collection of WEEE and batteries and to suggest possible new ways to open up the market to multiple compliance schemes operating within a given waste stream.
>
> Given the overall national imperative to improve competitiveness, a benchmarking of the costs incurred by producers in Ireland is required against those of other European Member States in respect of the individual waste streams which are subject to producer responsibility. This benchmarking exercise should also include a breakdown and analysis of the cost base of Irish compliance schemes against their European counterparts plus an analysis of the costs incurred for the actual recycling of the waste (p. 21).

This is an ambitious terms of reference set by the Department of the Environment, Community and Local Government (DoECLG).[9] It can be broken down into four distinct, but related, issues.

First, are there an optimal number of EPR compliance schemes that maximises operational efficiencies? It is necessary to answer this question before turning to the other issues under the rubric of competition. The optimum number of PROs will depend on the extent of economies of density, scale and scope. For example, if there are substantial economies in the provision of EPR compliance scheme services then that suggests a single provider could be optimal. In order to ensure the lowest compliance costs, consideration might be given, for example, to introducing competition

[9] It should be noted that the terms of reference also contain a specific reference to examining the impact on competition of the introduction of one or more additional PROs in packaging, an issue which we address in this paper at some length. For details see DoECLG (2012a, p. 16).

for the market (i.e. tendering for the right to provide the compliance scheme for (say) every five years) as compared to competition in the market under which competition takes place between PROs in a particular waste stream for customers.

Second, do current arrangements inhibit or discourage competition? Here attention will be devoted to the conditions of entry and whether there are any barriers to competition between PROs. The entry conditions refer to costs of entry such as the regulatory costs referred to in Section 1 in terms of filing an application for approval from the Minister to be a PRO in a given waste stream. Are these procedures, for example, clear and transparent thus, other things being equal, facilitating entry? Examining barriers to competition between existing PROs raises issues such as how easy it is to switch from one PRO to another. If these costs are unnecessarily high then one option is introduce a Switching Code to facilitate competition.

Third, two specific issues are raised in relation to the WEEE and batteries EPRs: to review the current geographical split between WEEE Ireland and ERP for the collection of WEEE and batteries; and suggest possible ways in which additional EPR compliance schemes can be introduced. The answer to the first of the four questions posed above should enable a certain amount of clarity to be brought to the review of the appropriate geographic split. *Fourth,* benchmarking the performance of EPR schemes in Ireland against the record elsewhere, by comparing costs. As noted above most Member States employ EPR compliance schemes to meet the various environmental targets set at the EU level. Nevertheless, international comparisons are often difficult to make because of institutional, definitional and other differences which it may be challenging to take into account.[10]

Underlying the terms of reference is the view that there is a need to drive down the costs of complying with environmental regulation through EPR compliance schemes so as to improve Ireland's competitiveness and thus create jobs and exports. The terms of reference highlight competition between PROs as one mechanism that might reduce such costs. However, this is a hotly debated issue. For example, in the case of packaging the incumbent PRO, Repak, has commissioned research (Indecon, 2010a) showing that one PRO is the best solution, while the potential new PRO entrant, ERP, has commissioned research (Grant Thornton, 2010) that shows the benefits exceed the costs of a second packaging PRO.[11]

[10] It should also be noted that the terms of reference, in relation to each specific waste stream, state that the study should examine and report on, "the effectiveness of the current competitive dynamic in the waste streams where PRI operates and how it can be maximised (i.e. existing schemes enhanced and/ or additional schemes made subject to PRI) to increase competition, lower costs for producers & lower the potential for free-riders, and also bearing in mind the potential increase in costs which might arise due to the increases in the number of compliance schemes" (DoECLG, 2012a, p. 13). The first three of the four issues identified in the text are relevant to addressing these issues.

[11] It should be noted that the two studies address somewhat different issues: Indecon (2010a) is concerned with the impact of the number of PROs on recovery and recycling rates; Grant Thornton (2010), the impact of an additional packaging PRO on membership fees.

3. The Economics of Producer Responsibility Organisations

The PRO plays a critical role within an EPR compliance scheme by offering a service that enables producers to comply with their environmental obligations. Producers thus delegate this responsibility to the PRO for a fee, usually based on their contribution to the waste stream measured by, for example, weight, and satisfactory participation in the compliance scheme. The PRO organises or supports the collection and sorting as well as recovery of waste. It may decide to provide these services itself or alternatively contract with third parties – in the case of packaging, household and commercial waste collectors. Typically the latter option is selected, with the PRO making payments to firms for collection, sorting and recovery, referred to as subsidies. PROs are usually not-for-profit bodies with a relatively small staff.[12]

In order to better understand and explore the role that competition has in the provision of the PRO services we consider three functions or objectives of a PRO:

- to meet binding EU environmental targets;[13]
- to contract with firms to collect, sort and recover waste; and,
- to educate and create awareness.

The latter two objectives are inputs towards meeting the first objective. Hence the three functions are closely linked to one another.

Table 1

Number of PROs per Waste Stream, EU-27, 2012[a]

Waste stream	Number of Member States with a Given Number of PROs			
	1 PRO	2 PROs	3 PROs	4 or more PROs
Packaging	18	4	2	3
WEEE	7	8	5	4
Batteries	9	5	1	4
ELV	11	3	0	0
Tyres	13	0	0	0

a. Note that information is not available for all waste streams and/or there is no PRO (e.g. ELVs in Ireland).

Source: Bio (2012, Annex 4, pp. 62-68).

In each case we consider the implications of having one as opposed to two or more PROs in meeting these objectives. In this discussion we draw on the experience in Ireland and elsewhere. However, what is striking is the lack of empirical studies on either the impact of the number of PROs on recycling and recovery rates or the membership fees paid by producers to use the services of a PRO. In part this lack of evidence reflects the fact that most Member States typically only have one or two PROs per waste stream (Table 1). However, as shown in Table 1, there is considerable variation in

[12] Repak, for example, in 2009 had a staff of 35, WEEE Ireland 10, based on statutory accounts.

[13] There are binding EU targets for packaging, batteries, ELV and WEEE, but not for farm plastics and tyres. In the case of farm plastics Ireland sets environmental targets. For progress on meeting these targets see EPA (2012, pp. x-xii).

the frequency distribution of the number of PROs per waste stream, an issue we will return to below.

Table 2

Market Arrangements, Geographic Market, Number of PROs[a]

Geographic Market	Number of PROs .	Illustrative Example
National	1	Repak/packaging/Ireland
National	>1, centralised procurement of services (e.g. collection, sorting, recovery)[b]	DSD and eight other PROs/packaging/Germany
National	>1, decentralised procurement (e.g. collection, sorting & recovery)[c]	-
Sub-national (i.e. regions)	1 per sub national area.[d]	WEEE Ireland & ERP/WEEE & batteries/Ireland

a. It would be possible to replicate >1 centralised procurement and >1 decentralised procurement for sub-national markets. However, for a small country such as Ireland these options were not considered feasible.
b. Centralised procurement means that a common set of rates for collection etc are negotiated and used by all PROs.
c. Decentralised procurement means that each PRO has to arrange their own collection etc on a national basis.
d. The PRO would be responsible for providing the full range of member services with respect to the sub-national area.

Source: See text.

In order to better understand the functions of PROs we consider four market arrangements which are defined and described in Table 2. PROs can serve either national (e.g. packaging in Ireland and Germany) or sub-national (e.g. WEEE and batteries in Ireland) markets. If the market is national then the PRO(s) is responsible for providing services across the country, rather than for a particular region or sub-national area. At the national level the number of PROs can be either one or greater than one, with the latter divided into those where certain services or functions are centrally procured (e.g. collection in packaging in Germany) or where each PRO is responsible for delivery of the various PRO services or functions (i.e. decentralised procurement).[14] In the case of sub-national markets each PRO serves the market area it has been assigned.

Meeting the Binding EU Environmental Targets

The primary purpose of the PRO, from the viewpoint of the DoECLG and the legislation that underpins the creation of PROs, is to meet the binding EU environmental targets specified in legislation and incorporated in the conditions under which a PRO is licensed by the Minister. The targets are typically expressed as a certain percentage of a waste stream that should be recovered or recycled by a certain date. If the targets are not attained then the State can be taken to the

[14] There is a third possibility under which PROs within a waste stream specialise in certain sub-sectors of the waste stream. For example, in Belgium although there are two PROs in packaging, they do not compete with one another, since Fost Plus deals with household packaging recovery, while the other, VAL-I-PAC deals with industrial, commercial and institutional packaging. For details see SAIC (2012, pp. 4-2 - 4-3). However, in such instances each PRO should be treated as single PRO for a particular waste stream.

European Courts by the European Commission for non-compliance. A fine on the State is likely to result, which is, of course, borne by Irish taxpayers, not the producers or the PRO. Thus the State has a strong interest in ensuring that the arrangements for the provision of PRO services that maximise the chances that the targets are met.

The DoECLG needs to be satisfied that the arrangements for meeting the targets are credible and that the PRO(s) can be held to account if the targets, which need to be monitored on an ongoing basis, are not met. In other words, the PRO has to be appropriately incentivised to meet the targets. Such considerations are likely to become more important in meeting future environmental targets as the low hanging fruit in terms of meeting targets has already been gathered. Meeting future targets is therefore likely to be more challenging as the marginal cost of the extra percentage point addition in recycling and recovery rates increases.

A Single vs. Multiple PROs: Holding the PRO to Account

If there is a *single* PRO for a waste stream then the DoECLG has to examine only one application and hold only one PRO to account. The PRO could be held to account for failure to meet environmental targets in a number of ways. Since the PRO is typically licensed for a given period of time, its license could not be renewed or it would have to compete with other potential PROs for the right to provide PRO services for a particular waste stream. This suggests that one of the considerations in determining the length of time for which the PRO is licensed should relate to the deadlines for meeting the environmental targets.[15] The PRO could also be subject to various financial and non-financial penalties if the target is not met, depending on the degree to which the target is missed.[16]

In both instances, however, there would need to be a carefully specified set of conditions and assumptions concerning, for example, implementation of various necessary policy measures in order for the PRO to be held to account. This might suggest a formal service level agreement between the Minister and the PRO, as recommended by Philip Lee (2013, pp. 10-14). For example, if there were a PRO for ELV in Ireland, then a clause in such an agreement might be that legislation would be passed such that the owner of car would be liable to pay road tax until s/he could produce a Certificate of Destruction or death certificate for their vehicle from an authorised treatment facility (ATF).[17] This would discourage leakage of ELVs outside the system of approved ATFs and thus facilitate the meeting of targets. More generally the agreement might include undertakings by the Minister concerning enforcement action against firms that refuse to comply and for those that self-comply provision for contribution towards the public good activities of a PRO, such as raising awareness.

The situation is likely to change with the introduction of *additional* PROs for a waste stream. First, how are the various PROs to be held responsible for meeting the targets? The PROs are likely to differ both at a point in time and over time in terms of their membership, size, and perhaps the geographic area in which they are responsible for the collection, sorting and recovery of waste. These characteristics are likely to affect success of a PRO in meeting the targets as between the two

[15] This suggestion made here is acknowledged in the corporate governance report prepared as part of the Review of the Producer Responsibility Initiative Model in Ireland. See Philip Lee (2013, p. 16).
[16] For further discussion see Philip Lee (2013, pp. 11-12).
[17] This point is made by SIMI (2012) in its discussion of producer responsibility in ELVs. The report on ELVs prepared as part of the Review of the Producer Responsibility Initiative Model in Ireland, RPS (2013b, p.31, p.37), recommends the introduction of a continuous vehicle taxation system.

or more PROs. One PRO may cherry pick or cream skim producers whose waste is easily collected, sorted and recovered, while the other PRO may not as a result be able to meet the target.[18] In the case of packaging waste, for example, one PRO might specialise in commercial waste recovery and recycling, while the other specialises in waste generated from the household. Bacon (2008, p. 15) estimated that it costs about €70 per tonne to collect commercial waste and €200 per tonne for household waste.[19] Hence it may be difficult for the DoECLG to hold a particular PRO responsible for meeting an appropriate share of the target, without taking into account these differences, a difficult and time consuming task. Of course, there may be ways of mitigating such problems, depending on the market arrangements. We consider two situations.

Multiple Exclusive Geographic Markets

One option would be to create multiple geographic markets with a separate PRO assigned to each market. In the case of WEEE and batteries in Ireland, for example, each of the two PROs is given exclusive responsibility for collection, sorting and recovery of WEEE and batteries for different mutually exclusive geographic areas that in some sense are the same from the viewpoint of the cost and ease of achieving targets. Here the only additional cost of a second PRO compared with a single PRO is the cost for the DoECLG of negotiating and approving a second PRO and dividing the State into two relatively homogenous parts in proportion to the market shares of the PROs. These costs are unlikely to be high given a standard boiler plate DoECLG/PRO agreement combined the experience of WEEE and batteries to draw upon. As the number of PROs increases, however, these costs are likely to increase. Dividing up the State is likely to become a more difficult task and require more ongoing boundary changes as market shares vary between PROs. Furthermore, the PROs may not always agree with the DoECLG's geographic division which further complicates the issue and raises the costs. Even if the geographic boundaries are arranged by the PROs – as in the case of WEEE and batteries in Ireland (Sander *et al,* 2007 p.xii) - it is likely to become more difficult and time consuming to agree on a mutually acceptable division as the number of PROs increases.

Single National Geographic Market with Multiple PROs

Under this option there is more than one PROs licensed for a particular waste stream, but they all serve the national market. We consider two ways – centralised and decentralised procurement of collection, sorting and recovery - this market could be organised, with implications for the ease with which PROs can be held to account. However, in each case the DoECLG would have to license individual PROs, but if there are, as noted above, standard boiler plate DoECLG/PRO agreements then these costs may not be substantial.

If the PROs participate in *centralised procurement* of waste collection, sorting and recovery, then the PROs act collectively rather than independently. For example, in Germany there are nine packaging PROs, all of which have a national remit, and are involved in a common centralised procurement process for the collection, sorting and recovery of a particular waste streams. The success or failure of these common arrangements determines whether or not the targets are met. Hence all the PROs are collectively responsible for meeting the targets and thus none are. Does this mean if the targets

[18] The issue of cherry picking is raised, for example, by Indecon (2010a, p. 76).

[19] This is consistent with Repak (2010, p. 9) reporting that in 2009 commercial waste accounted for 67 per cent of packaging waste recovered measured in tonnes, but cost only 23 per cent of expenditure on packaging (i.e. household and commercial) recovery.

are not met all are sanctioned equally? How will this collective PRO responsibility impact other areas of meeting the targets, such as education and awareness?

If PROs are involved *decentralised procurement* of collection, sorting and recovery each PRO would conduct these activities on a national basis separately and independently. While each PRO could be set targets that mirrored the national targets, there could be problems of cream skimming or cherry picking to meet the targets. Of course, conditions could be attached to the PRO license to attempt to take this into account. However, this is likely to be time consuming to specify and monitor.

Single vs. Multiple PROs: Monitoring PRO Performance

An important part of holding the PRO to account is ongoing monitoring of its performance. It is essential from the viewpoint of the DoECLG to identify early problems in meeting targets and ensuring, together with the PRO, that appropriate remedial action is taken to address any shortcoming.[20] If a single PRO is responsible for collecting all the data for the purposes of monitoring performance, which is then provided to the DoECLG, checks need to be built into the collection, sorting and recovery of only one system in order to verify the accuracy of the data supplied in the conditions licensing the PRO.[21] Furthermore, if the monitoring reveals ongoing problems with the PRO meeting the targets then negotiations and discussions need to be held with only one PRO.

The provision of information to the DoECLG to monitor progress towards meeting the environmental targets may be more difficult, problematic and subject to error with several PROs compared to one PRO. This is particularly the case with tyres.[22,23] There may be problems of double counting, particularly when a producer switches from one PRO to another and of misreporting when a firm involved in collecting, sorting and/or recovery does not file information correctly. Furthermore there is a need to ensure that systems used to record and verify recycling and recovery rates are compatible between the different PROs. If there are shortcomings in meeting the target, negotiation and discussion with several PROs is likely to be more difficult and time consuming compared to a single PRO. Of course, there may be ways of mitigating such problems, depending on the market arrangements. We consider two situations.

[20] For further discussion see Philip Lee (2013).

[21] In the case of WEEE and batteries this is delegated to the Environmental Protection Agency (EPA), which carry out the checks when compiling the National Waste Reports (e.g. EPA, 2012).

[22] For tyres the PROs are responsible for the "operation [of] a system with the objective to ensure the proper management of all waste tyres by tracking tyre and waste flows" (Schedule of Conditions to letter from Minister approving TRACS as a PRO, 19 December 2007). TRACS, the first PRO licensed in the tyre waste stream, maps the flow of tyres from their importation into Ireland and their subsequent movement through the supply chain from wholesaler, retailer to waste tyre collectors. However, with a second PRO, TWM, licensed in 2009, not surprisingly holes and gaps begin to appear in recording the flow of tyres through the supply chain. As a result TRACS (2011, p. 3) claim that the operation of a second PRO "has compromised overall data collection and reconciliation."

[23] This view is consistent with RPS (2013a, pp. 47-48). It should be noted that between 24 and 51 per cent of tyres are unaccounted for by the current tracking system in Ireland, which is high by EU standards (*ibid*, pp. 42-45).

Multiple Exclusive Geographic Markets

In the case of multiple geographic markets a third party can become involved in order to ensure accurate and timely information for the purposes of monitoring performance in meeting the targets. In the case of WEEE and batteries, for example, where WEEE Ireland and EPR operate as PROs for each of these waste streams, all producers – whether they self comply or are part of a PRO, use a common registration system, the WEEE Register Society Limited (WRS).[24] Producers register with WRS and input information concerning the exact quantity and weight of EEE and battery products that they place on the market. Under this system there is little or no chance of double counting in terms of the volume of waste that is coming to the market. Furthermore, WRS assumes this function from the PRO so that it is not replicating, but rather displacing, a function. In terms of the volume of waste collected, sorted and recovered, each of the PROs is responsible for directly contracting in its geographic area for collection, sorting and recovering so it will be in possession of audited figures on these magnitudes. Hence the DoECLG will be in a position to monitor performance. It will have the amount placed on the market and the recovery and recycling rates of waste collected. The ability to negotiate and discuss shortcomings will depend on the success of each PRO, but the costs will increase as more and more PROs are added.

Single National Geographic Market with Multiple PROs

In the case of a single geographic market with multiple PROs the ease of monitoring depends on the way the market is structured. In the case of *centralised procurement* arrangements then aggregate data on collection, sorting and recovery would be available, while each PRO would receive reports from its members as to the volume of potential waste placed on the market, which could be organised through a mechanism such as WRS Ireland. However, if targets were not being met then reaching agreement with the PROs is likely to be time consuming and difficult. All the PROs would need to agree on why the target was not being met, what should be done and how it should be funded. If reasonable people could disagree on these issues then reaching an agreement is likely to be difficult. In the case of *decentralised procurement*, the problem is even more difficult. Each PRO would report the same data to the DoECLG. However, monitoring by the DoECLG is likely to be more difficult. The type of waste collected and the manner would need to be carefully monitored to ensure that it accorded with the license and the DoECLG would have to negotiate and reach agreement with each PRO separately, a potentially time consuming exercise.

In sum, it appears that there are advantages in terms of a single PRO per waste stream from the viewpoint of the DoECLG in terms of awarding the PRO license, monitoring progress towards meeting the targets and holding the PRO to account. However, mechanisms and arrangements can be devised to deal with the problems of more than one PRO. This raises the costs for the DoECLG and may make holding PROs to account for meeting targets more difficult. However, the marginal or additional costs are likely to be low for the second PRO depending on the market arrangements, but increase in a non-linear fashion as third and fourth PRO are added, irrespective of the market arrangements.

[24] For details see WRS (2011) and http://www.weeeregister.ie/faqs.html. Accessed 22 August 2012.

A Single vs. Multiple PROs: the Case of Packaging

[Discussion of Indecon (2010a), commissioned by Repak, on the relationship between recovery and recycling rates for packaging treated as whole and for various packaging sub categories such as plastics, paper, wood and so on, and the number of PROs, has been redacted].

What Role for the State?

If there is a single PRO then the State is essentially delegating to that PRO the achievement of certain public policy objectives in terms of achieving targets. Furthermore, as we shall see below, in seeking to achieve these targets the PRO may undertake certain quasi public roles in relation to promoting consumer awareness and education. It could be argued that it would be inappropriate for the meeting of environmental targets to be delegated to a private operator (i.e. a PRO). A separate regulator, it might be argued, should play a more central role. However, such an argument underplays the existing level of supervision by the DoECLG. In other words, it confuses form with substance. The DoECLG is responsible for the licensing of the PROs and monitors their progress towards meeting the environmental targets. Indeed, under the terms of their licenses PROs are required to submit detailed annual reports to the DoECLG. In other words, there is already regulation of PROs and hence it is difficult to see the merit in creating a separate regulatory authority to deal with these issues, especially in a time of severe constraints on public expenditure. Furthermore, there are a number of instances where private firms deliver quasi-public goods for the State such as Universal Service Provision of some telecommunications services by Eircom, and so on. If there is more than one PRO co-ordination and regulatory problems increase, but these do not seem insuperable as demonstrated with respect to WEEE and batteries. These issues are discussed further below under 'Education and Awareness.'

Contracting for Waste Collection, Sorting and Recovery.

In meeting the environmental targets the PRO is responsible for arranging for the collection, disposal, and recovery of the particular waste stream. Typically the PRO, although it has the choice of contracting or self supply, contracts for the provision of these services to third parties. In some instances it is a public or private contractor, such the green bin collection for packaging and in others, local authorities, such a bring centre or civic amenities site. However, the PRO may assist directly in the collection process. In the case of WEEE, for example, the PROs organises special collection events.

Table 3 shows that the collection, sorting and recovery of waste account for a substantial share of the expenditure of PROs that operate in Ireland.[25] In the case of packaging, for example, 83 per cent of total expenditure by the PRO, Repak, in 2009 consisted of payments to local authorities, recovery operators and recyclers, while the corresponding percentage for farm plastics was 82 per cent. In the case of WEEE and batteries the importance of collection, sorting and recovery is lower at 51-58 per cent and 39-49 per cent, respectively. These differences might be accounted for the fact that Repak is a well established PRO dating back to 1997, while the PROs in WEEE and batteries are more recent dating from 2005 and 2008, respectively. When a PRO is first created it has to put

[25] In some cases the PRO is responsible for the collection, sorting and recovery of waste put on the market by its members (e.g. WEEE and batteries), while in others the PRO contributes towards the collection, sorting and recovery of waste by its members (e.g. Repak under its Repak Payment Scheme).

considerable effort in creating not only systems for collection, sorting and recovery, but also awareness and education amongst consumers and producers, which in both cases is likely to contain a fixed and non-recurring element. Hence as PROs mature if greater competition between PROs is to lower costs, it is likely to be centred on collection, sorting and recovery. Another explanation is that the expenditure figures are net, and not gross, taking into account any revenue associated with the sale of the waste stream. In the case of batteries, for example, WEEE Ireland started collecting significant quantities of automotive and industrial batteries which have a positive value and hence WEEE Ireland has lower collection costs compared to ERP.[26] Irrespective of the explanation it appears that if greater competition between PROs is to lower costs then collection, sorting and recovery is likely to be where the savings are to be made.

Table 3
Payments for Collection, Sorting and Recycling as a Proportion of Total Expenditure, PROs, by Waste Stream, Ireland, 2009-11.[a]

Waste Stream/PRO	Collection etc Payments/Total Expenditure (%)
Packaging/Repak	83
WEEE/ERP & WEEE Ireland	51-58
Batteries/ERP & WEEE Ireland	49-39
Farm Plastics/Irish Farm Films Producers Group	82

Notes: a. 2009 for packaging; 2011 for WEEE and batteries; and 2010 for farm plastics.
Source: Repak (2010, p. 9), and information supplied by the PROs.

Single vs. Multiple PROs: Some General Considerations

The choice of contracting reflects the fact that there are numerous specialised skills in the operation of collection, disposal and recovery in which the PRO has little, if any, expertise. The cost of provision of these services by existing firms is likely to be lower than if the PRO were to enter this market de novo. For example, the marginal cost of an existing household waste collector to collect packaging in the green bin is likely to be lower (since it also includes other dry recyclables such as newspapers, magazines and periodicals) than for the PRO to set up a separate collection service for packaging only.

The PRO pays for the collection, sorting and recovery through a contracting process. This may be through a tendering procedure or negotiation with the suppliers. If the waste stream has no value then the PRO will simply pay for some or all of the cost of collection etc. If, however, the waste stream has some value then this is likely to offset some of the costs of collection etc.[27] As Bacon (2008, p. 16) observes if the value of these waste streams is high enough then they may be recycled without any payment by the PRO. However, even if this is the case, the PRO is likely to pay a

[26] This is consistent with the share of collection, sorting and recycling in expenditure for batteries for WEEE Ireland decreasing from 52 per cent in 2009 to 39 per cent in 2011, while for ERP it increased from 25 to 49 per cent.
[27] It should be noted in some cases in Ireland the waste is owned by the PRO (e.g. WEEE and batteries), while in other cases such as packaging the waste is owned by the collectors. In the former case the PRO organises the collection of waste through a tendering process and then recovers any revenue if the waste stream has value. In the case of the latter the PRO pays subsidies to ensure that the waste is collected, sorted and recovered. The value of the waste stream does not accrue to the PRO.

subsidy, "largely as an incentive for firms to record the waste and maintain an audit trail" (*ibid*, p. 16).

The PRO does more than pay for the collection, sorting and recovery of a waste stream. It also audits the firms providing these services in order to ensure that the volumes billed are correct, that the waste is stored correctly, that it is exported to an approved site for further treatment, and so on.[28] These audits are usually linked to an extensive billing system that records and traces the waste via its various waste treatment stages so as to ensure, for example, traceability. The audits can be done by independent auditors and may consist of unannounced visits to a contractor's premises.

Now let us consider the situation if there if there are more than one PRO. The transaction costs of arranging for the collection, disposal and recovery of the waste stream is likely to increase. Each PRO incurs the same fixed costs in performing this function. It is difficult to envisage that the tendered or negotiated price will be lower with several as compared to one PRO. In the case of household waste collection due to economies of scope, scale and density there is likely to be only one supplier for any given geographic areas; two suppliers replicating each other would needlessly raise costs.[29] However, in collecting waste from businesses where such economies are likely to be less then more than one supplier of the collection, sorting and recovery services may be feasible. With several PROs each on auditing service providers means that the latter are likely to include the extra time required to deal with multiple audits in the subsidy rates charged the PROs. Of course, there may be ways of mitigating such problems, depending on market arrangements. Essentially they involve arrangements that result in a single contractor of the collection, sorting and recovery services, with the result that transaction costs and subsidies are much the same as with one PRO.

Multiple Exclusive Geographic Markets

Under this market arrangement, as noted above, each PRO is given exclusive responsibility for collection, sorting and recovery for waste generated in a specific geographic area. In essence it acts a single PRO for these functions for the defined geographical area. If the economies of collection, sorting and recovery are largely local then the division of Ireland into a small number of geographic markets is likely to ensure that the economies are realised.[30] As noted above the multiple exclusive geographic markets option has been selected for WEEE and batteries in Ireland where there are two PROs. There are side payments if one of the PROs collects more (or less) than is put on the market compared with the market of the waste its members put on the market.[31] There may be reallocation

[28] See Repak (2010, p. 8) for packaging and WEEE Ireland (2011, pp. 25-27) for WEEE and batteries.

[29] For details see, for example, Andrews and Gorecki (2010), Competition Authority (2005) and DoECLG (2012c).

[30] While economies of scale in collection may be exhausted at modest scale, the evidence suggests that the economies for sorting are likely to be greater. For details see sources in previous footnote.

[31] Assume that ERP members place 30 per cent of glass on the market, but ERP only collect 25 per cent of the glass from the geographic area for which it is has responsibility. ERP then it makes a side payment to WEEE Ireland estimated as follows: yx(0.05x30,000), where y = ((subsidy per tonne for glass paid by ERP + subsidy per tonne for glass paid by WEEE)/2) and 30,000 is the assumed size of the market measured in tonnes. The side payment is estimated for each waste stream within WEEE (e.g. glass, wood etc) by WRS Ireland, the sums totalled and a single payment made. Under this arrangement sensitive price information charged by the PROs is not revealed, since the calculations are done at arm's length.

of collection areas, every so often to reflect changes in market share of the PROs, but this requires non-trivial market share changes.[32]

Single National Geographic Market with Multiple PROs

As noted above procurement in a single geographic market can be organised by the PROs either on a centralised or decentralised basis. In the case of *centralised procurement*, this can be either jointly conducted negotiations to determine the contractual terms and conditions or delegated to a third party or to one of the PROs. The centralised purchaser is able to determine the optimum contractual arrangements to minimise subsidies, subject to meeting the targets. The providers of the collection, sorting and recovery services bill the organisation negotiating the contract, which in turn bills the PROs depending on the volume of waste that they account for over the given period. This mechanism used, for example, in Germany with respect to packaging. Here one PRO conducts all the tenders.[33]

Under a system of *decentralised procurement* each PRO is responsible for negotiation agreements for collection, sorting and recovery across the State. Transaction costs are almost certainly going to be higher than any of the arrangements set out above, while there are likely to be difficulties in realising economies of scale and density in collection, sorting and recovery, resulting in higher subsidies. Bacon (2008, p. 29) is thus undoubtedly correct when he concludes, in the context of packaging, that "the consultants do not perceive that there is anything to gain from introducing competition by replicating Repak's operations in another scheme."

In sum, there are likely to be advantages in terms of lower transaction costs, lower contract subsidies and ease of auditing from a single PRO compared to multiple PROs contracting for the same services over the same geographical area. However, strategies can be introduced to mitigate the impact of more than one PRO, while retaining the advantages of a single PRO in terms of minimising transaction costs, low subsidies, ability to track waste and audit service providers. However, the costs are likely to be low for the second PRO depending on the market arrangements, but increase in a non-linear fashion as third and fourth PRO are added, irrespective of the market arrangements.

A Single vs. Multiple PROs: the Case of Packaging

[Discussion of Grant Thornton (2010), commissioned by ERP in its application to become a PRO in packaging, that addresses the question of whether or not the benefits exceed the costs of an extra PRO for packaging for Ireland has been redacted].

The German Packaging Example

The German experience is an example where there was a switch from a single PRO, Duales System Deutschland (DSD), to nine PROs. This, it is argued, led to a reduction in collection costs. According to the German contribution to a 2010 OECD Roundtable on *Horizontal Agreements in the Environmental Context* the removal of the DSD monopoly and the injection of competition led to a

[32] Four percentage points according to ERP. Interview with ERP 5 September 2012.
[33] This discussion of the German experience is based on OECD (2011, p. 54-55). There is further discussion below.

substantial reduction in the cost of collection and recovery of packaging from €2 billion to €1 billion.[34] This is indeed a dramatic reduction. However, care needs to be taken in interpreting this as meaning that an increase in the number of PROs per waste stream and the associated increase in the appearance of competition lead to lower PRO membership fees. As we shall see there is a danger of confusing correlation with causation.

The structure of DSD is not the same as PROs in Ireland. The latter are not-for-profit organisations. Although industry led they are not owned by waste packaging firms. DSD, which was established in 1992 was owned by manufacturers of packaging, retailers and waste disposal firms. Indeed, the German competition authority, the Bundeskartellamt (2004), referred to the structure as "cartel like." The involvement of the waste disposal firms in DSD reflected the fact that when DSD experienced financial difficulties in 1992 waste disposal firms lent DSD funds which were converted into equity. There were three representatives of the waste disposal firms on DSD's board.[35] This created a clear conflict of interest since the PRO was purchasing the services of the waste disposal firms. In the case of the PROs in Ireland, so far as we are aware, no waste disposal firms have an ownership participation in the PRO nor are they on the board of a PRO.

It is apparent when ownership structure of DSD was changed with the removal of firms with waste disposal interest and the employment of open and transparent tendering methods that prices fell for waste collection. As the Bundeskartellamt (2004) stated,

> The positive effects of competitive market behaviour which is not burdened by vested interests could already be witnessed from the invitation to tender for service contracts put out by DSD. In order to allay the competition concerns of the Bundeskartellamt the new Board of Directors of DSD decided in early 2003 to implement for the first time a transparent and non-discriminatory system of awarding service contracts to the waste disposal companies. In order to end the interlocking interests it was important that waste management companies abandoned their participation in DSD.

The first PROs to enter packaging did not occur, according to Indecon (2010a, p. 78) until 2005 (two entered), 2007 (four) and 2008 (two).

Thus it would not appear that the move from one to nine PROs in waste packaging that caused the savings reported above, but rather the reform of the structure of DSD and the introduction of an open and transparent tendering procedure. Even today DSD conducts all the tenders on behalf of the nine PROs (OECD, 2011, p. 55).

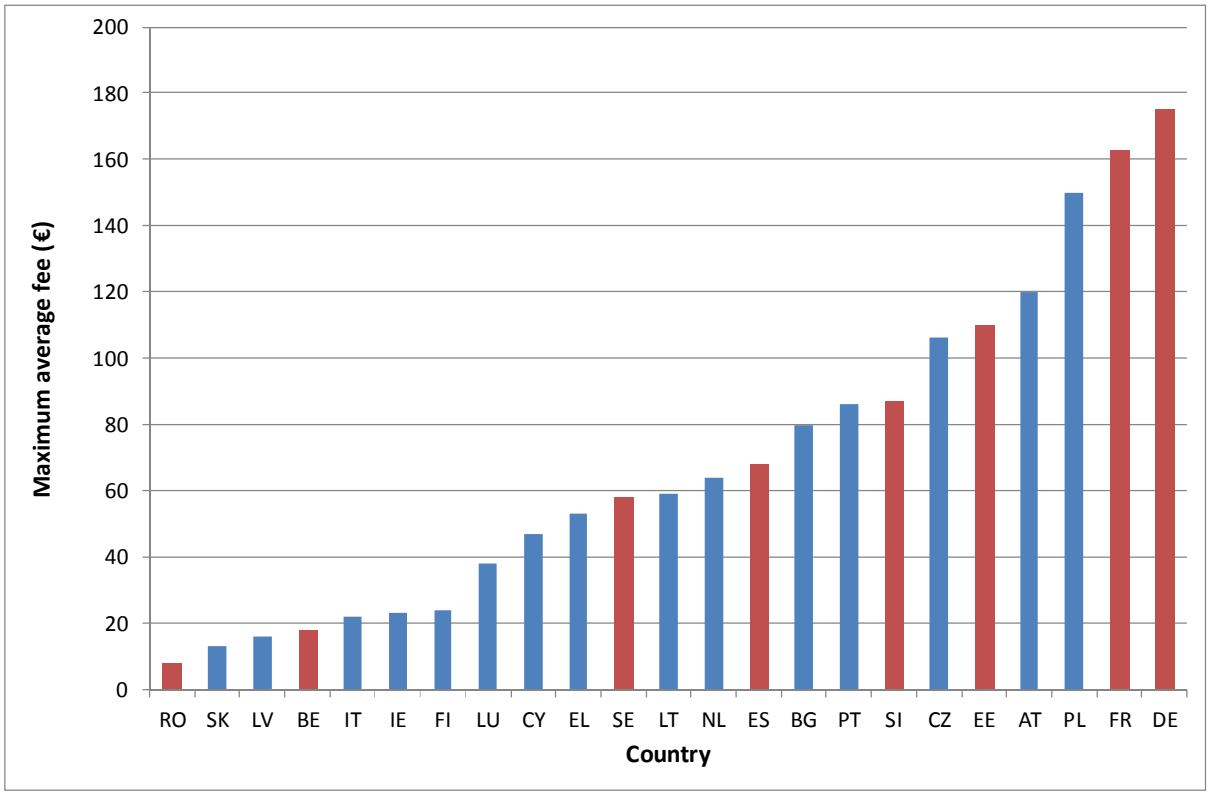
<u>The Number of PROs and Fees for Collection etc, By Member State: Packaging Waste Streams</u>

In order to explore the impact of the number of PROs per waste stream on costs we consider the relationship between the number of PROs per waste stream and the cost for producers in terms of the PRO fees per tonne for collection, sorting and recovery. Three waste streams were selected within packaging: paper, plastic; and aluminium.[36] The data was gathered by Bio (2012); it refers to

[34] OECD (2011, p. 53). Note that this discussion refers to household waste collection only.
[35] This is based on EC (2001, paragraphs 38-41).
[36] In the other waste streams that have PROs Bio (2012) typically only report fees for a much smaller number of Member States than for packaging waste streams. Hence the latter are used in this discussion.

events as of December 2012. Where there is more than one PRO per waste stream in a Member State, the average PRO fee per tonne for collection, sorting and recovery is estimated. Each of the packaging waste streams is classified to one of two categories: only one PRO; and, two or more PROs. The results are presented in Figures 1 to 3 for paper, aluminium and plastic, respectively.

Figure 1
Maximum Average PRO Fee Per tonne and the Number of PROs, Paper, by Member State, 2012

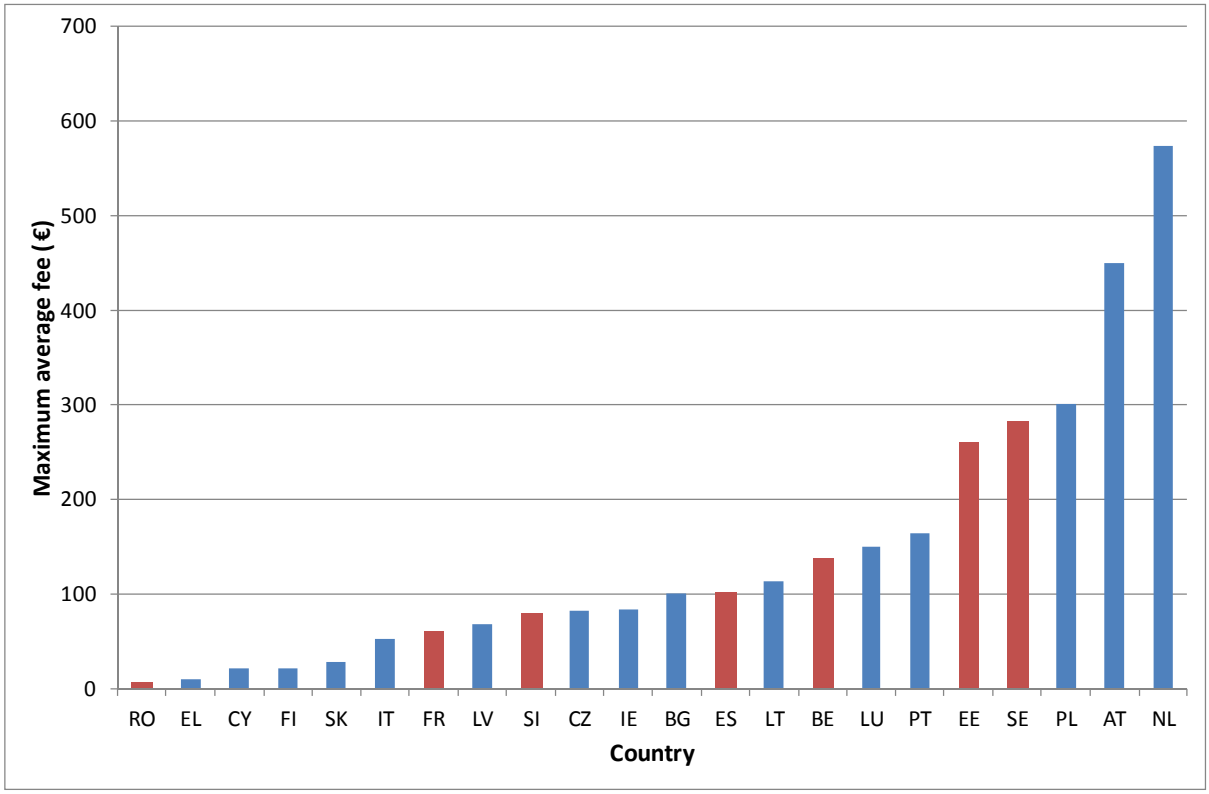


Key: Blue = one PRO per waste stream; Red = two or more PROs per waste stream. For country see Annex A.
Source: Bio (2012, Table 4, p. 19; Annex 4, pp. 62-68).

No clear relationship is evident between the presence of multiple PROs and the fees paid by PRO members. If we take paper in Figure 1, for example, there are Member States that have low fees but more than one PRO such as Romania (RO) or Belgium (BE), but equally there are Member States with more than one PRO and high fees such as France (FR) and Germany (DE).[37] Another way of describing the results is to say that there are Member States with low member fees characterised by one (e.g. Ireland (IE) or Latvia (LV) or more than one PRO. A similar pattern is revealed for plastics and aluminium. The pattern does not change if the two or more category is broken down more finely. The results are presented in Annex B below.

[37] On why fees are high in Germany see SAIC (2012, footnote 9, p. 2-2). The reasons for high fees do not include the number of PROs.

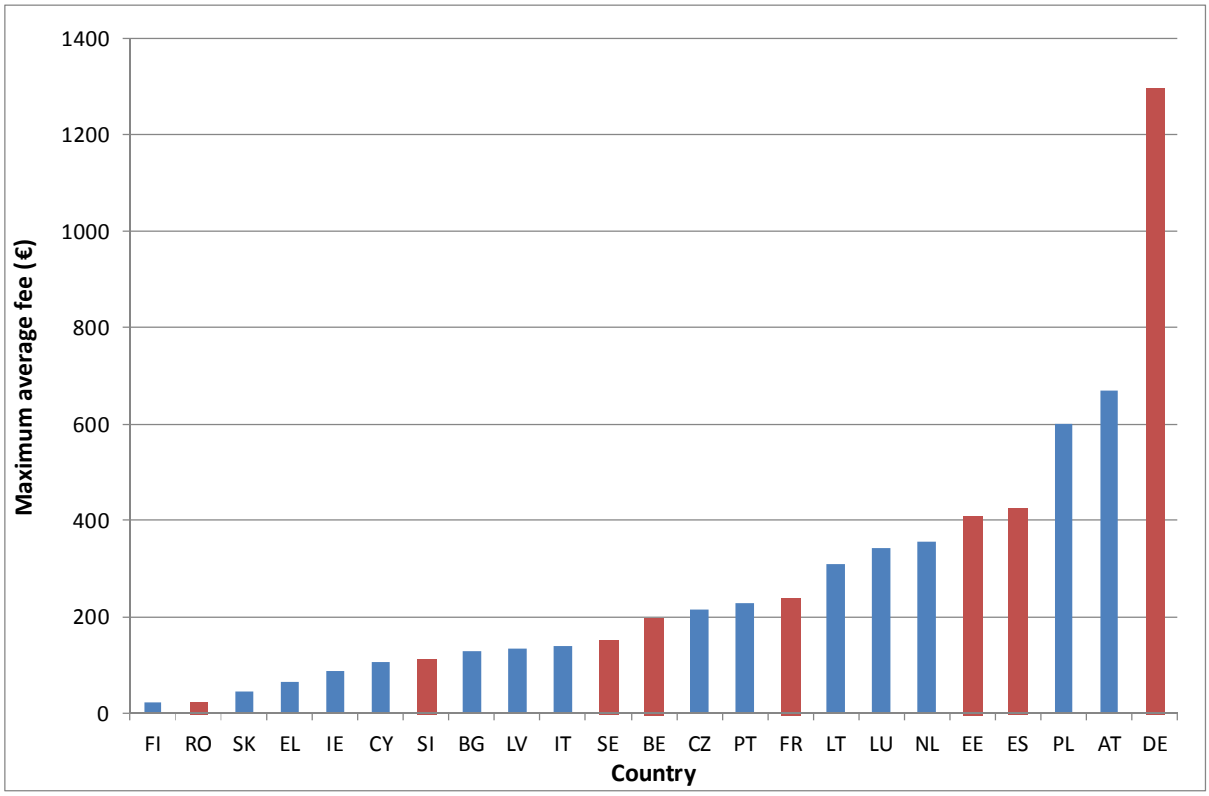
Figure 2
Maximum Average PRO Fee Per tonne & the Number of PROs, Aluminium, by Member State, 2012



Key: Blue = one PRO per waste stream; Red = two or more PROs per waste stream. For countyry see Annex A.
Source: Bio (2012, Table 4, p. 19; Annex 4, pp. 62-68).

The lack of a clear relationship between the number of PROs and member fees per tonne for collection, sorting and recovery should not be surprising for two sets of reasons. First, the fees vary because of differences in the collection system, the target, the proportion of the costs of collection, sorting and recovery accounted for by the fees and the types of collection, sorting and recovery channels covered (e.g. household, industrial and commercial). Second, collection, sorting and recovery costs are likely to be a function of landfill costs, incineration charges and so on, which are likely to vary by Member State. This suggests that great care and attention is needed in interpreting the relationship between the number of PROs and fees per tonne for collection, sorting and recovery by Member State, by waste stream.

Figure 3
Maximum Average PRO Fee Per tonne & the Number of PROs, Plastic, by Member State, 2012



Key: Blue = one PRO per waste stream; Red = two or more PROs per waste stream. For Member States see Annex A.
Source: Bio (2012, Table 4, p. 19; Annex 4, pp. 62-68).

Education and Awareness

Waste is generated by consumers and businesses as they consume products. Education and awareness can assist in enhancing waste prevention and the effectiveness of collection, sorting and recovery of any given waste stream. Educating the consumer consists of informing and persuading them on how and what waste should be recycled. In some instances this can be quite specific. By carefully studying consumer behaviour a PRO can spot where there are gaps in recycling. For example, Repak (2012) identified lack of recycling of products from the bathroom and the workplace based on consumer surveys, which led to awareness campaigns to address the problem. In other instances awareness campaigns are targeted at times of the year when large volumes of packaging are likely to be created, such as Christmas (Repak, 2010, p. 15). In the case of WEEE and batteries, WEEE Ireland sponsored a TV programme and imparted the message of 'how to' recycle these products (WEEE Ireland, 2012, p. 30). It also organised special events where there might be limited access to recycling centre (*ibid,* p. 28). Finally, in the case of a PRO for ELV, consumers would be

informed that for a vehicle to be accepted at an ATF it must presented in one piece without important parts missing. Finally, with a single PRO involved in education and awareness, it can decide on the best allocation of funds across different media, targeted, as appropriate, at the national or regional level.

Let us consider the performance of these functions if more than one PRO is involved. Several difficulties arise which could result in a suboptimal amount of expenditure on education and awareness. Some education and awareness is in the nature of a public good in that if one PRO undertakes such a campaign then it may increase the recovery and recycling rates of other PROs in the same waste stream. For example, if WEEE Ireland sponsors campaigns on national TV and radio then it benefits ERP which also collects WEEE and batteries, but in a different part of Ireland. In other words they benefit from educational and awareness activities which are funded by others. They could co-operate,[38] but there may be problems with such co-operation. For example, WEEE Ireland collection boxes for waste batteries are blue while those of ERP are red, which may confuse consumers. Of course, there may be ways of mitigating such problems, depending on market arrangements.

In the case of *multiple exclusive geographic markets* each PRO has an incentive to optimise the amount of education and awareness consistent with meeting the targets. Its ability to attract members is based on its collection, sorting and recovery costs over the geographic area for which it has responsibility. It can internalise the externality created by such activities. This also makes it much more likely that agreement between PROs on national campaigns will be reached. However, no such an agreement has been reached between the two PROs for WEEE and batteries.[39] In the case of a *single national geographic market with multiple PROs* requires in the case of centralised procurement co-operation to achieve awareness and education, perhaps handed over to a third party, while for the decentralised procurement it is not clear how PROs could be incentivised when there is a real free rider problem.[40]

One way of resolving problems that arise with respect to education/awareness, irrespective of whether there are one or several PROs, is to let the State undertake such activity, with the PROs contributing to the advertising and awareness. However, this does not seem like a sensible idea,[41] except perhaps where there are broader education and awareness messages that span across several, if not all, compliance schemes. The PRO has an environmental target to meet and hence the incentive to ensure that this goal is met. Often a successful campaign may involve ensuring extra collection facilities are available which is within the remit of the PRO. If the State takes over this function then it is not clear how this would be co-ordinated. Furthermore the PRO is more likely to have the expertise and knowledge of where the gaps in collection, sorting and recycling of waste than the DoECLG. Finally, there is a real danger that in time of fiscal austerity the advertising and

[38] Indeed, as noted in Section 1 there is a legal obligation on PROs to co-operate.
[39] This may be rectified by placing appropriate conditions when the Minister approves these bodies as PROs.
[40] Hence there may be an argument in such cases for compulsory levy on the PROs to fund a body to undertake education and awareness, but with the PROs taking the lead.
[41] This is not to deny that may be some advantages to centralisation of all such activity, but given the points made in the paragraph it is felt that it is better to remain with the PRO. The Competition Authority (2011, p. 3) argues for the State to take responsibility for education and awareness.

awareness budget, if part of DoECLG would be cut, with no compensating reduction in the contribution by PROs. It would be just another tax.

Conclusion

The thrust of the discussion on the economics of PROs is that while there are advantages to having a single PRO responsible for a particular waste stream mechanisms and strategies can be designed such that these advantages are realised with the additional or one or more PROs. However, while the additional or marginal costs are likely to be low for the second PRO, depending on the market arrangements, they are likely to increase in a non-linear fashion as third and fourth PROs are added, irrespective of the market arrangements.

4. The Scope for Competition Between PROs

In this section we address the issue of the scope for competition between PROs in the same waste stream. Competition is seen as desirable because it is generally considered to assist in driving down costs, promoting innovation as well as providing producers with choice. We start by considering the ways in which a single PRO might be held responsive to member preferences, before moving on to the scope for competition among PROs as well as the pressures for co-operation. Here reference will be made to the discussion in Section 3, particularly with reference to the different market arrangements: a single PRO; multiple exclusive geographic markets; and, single national geographic market with multiple PROs, with either centralised or decentralised procurement.

A Single PRO: How Responsive?

Monopolies or sole providers are not generally thought of being responsive to consumer preferences or prone to promoting innovation. A long-standing monopolist in a market with high barriers to entry and with little prospect of entry is unlikely to be overly concerned about costs, prices and new product development. However, it is not at all clear that this is an accurate characterisation of the situation with only one PRO operating with respect to a particular waste stream. There are mechanisms for ensuring that the PRO is responsive to both the DoECLG and the membership of the PRO. In terms of environmental targets, as noted above, these are specified in legislation and incorporated into the licence issued by the Minister when licensing a PRO. Failure to meet the targets can result in the PROs license renewal being refused and/or a competition for the right to be the PRO. The latter threat is likely to be credible as there are PROs in other waste streams that are potential entrants.[42] In the 2010 five year renewal of the WEEE licenses for ERP and WEEE Ireland, failure to hit certain collection targets would result in the PRO having to increase spending on recycling and reuse awareness programmes.[43]

As to costs, the producers have some channels through which they can hold the PRO to account. The PROs are usually not-for-profit organisations on which the representatives of the members sit as directors. The PROs need to file and provide certain information to the members on costs and the way in which it goes about its business. This requires an appropriate governance and accountability mechanism. Here the DoECLG, as the licensing authority, has an important role in ensuring that the PRO is structured appropriately. The corporate governance report, Philip Lee (2013), commissioned as part of the Review of the Producer Responsibility Initiative Model in Ireland deals with the governance aspect of a PRO.

The necessity of the PRO to respond to the demands of the DoECLG and its membership and the provision of mechanisms to ensure accountability and responsibility should provide clear incentives for the PRO to meet targets, minimise cost and provide a suitable service for members whose only alternative with a single PRO is to self comply. Nevertheless, it is hard to argue with the view that

[42] In the case of packaging ERP has applied to become the second PRO in packaging.

[43] Section 7 of the letter renewing ERP's PRO dated July 2010. A similar provision is contained in the corresponding letter to WEEE Ireland also dated July 2010.

competition in most markets provides an added spur that assists in minimising costs. But how realistic is that option in the case of PROs?

Competition Amongst PROs: How Feasible?

Competition between PROs for customers will depend, amongst other things, on the membership fee that they charge. A large percentage of that fee reflects the costs of collection, sorting and recovery of the waste stream. However, as we saw in Section 3 the scope for competition between PROs depends to a considerable extent on the market arrangements. We thus consider the scope for competition where there are multiple geographic markets and where there is a single national geographic market.

Multiple Exclusive Geographic Markets

In this market model each PRO is assigned responsibility for the full range of PRO activities. On the supply side the PRO is responsible for collection sorting and recovery for waste deposited within a well defined geographic area. On the demand side its member can place their products on the market anywhere within the State. The PRO membership fee reflects the success of the PRO in sourcing collection, sorting and recovery, effectiveness in education and awareness as well as efficiency in administration within its defined geographic area. In other words, if the PRO can secure better deals with collectors, sorters and recoverers it is in a position to charge a lower fee to its members. Furthermore to the extent that the PRO is successful in this endeavour it will attract more members, its market share – measured by waste placed on the market by its members – will increase. The knock on effect will be that the successful PRO will be allocated a larger geographic area[44] to match the increase in its market share. Hence under the multiple exclusive geographic model – as specified above and drawing on the WEEE and batteries experience – competition between PROs is feasible and likely to provide appropriate incentives for driving down subsidies and membership fees, while at the same time meeting the environmental targets.

Single National Geographic Market with Multiple PROs

There are, as set out above, two variants of the single national geographic market model. Under the *centralised procurement* variant the PROs purchase collection, sorting and recovery services collectively, while there are strong grounds for arguing for similar arrangements with respect to education and awareness. It is difficult to see where competition between the various PROs can take place except with respect to efficiency of administration. Why would more rather than less PROs lead to lower subsidies for collection, sorting and recovery? It is not at all clear.

Under *decentralised procurement* there would, of course, be competition between PROs. Each PRO would be responsible for the full suite of PRO services across the State and would collect, sort and recover sufficient waste consistent with the market share that its members placed on the market. However, costs are likely to be high for the provision of PRO services in this market. The evidence as noted above is that are considerable economies of scale and density for collection, while the fixed costs of contracting are incurred by each PRO. If there are several PRO providing a national wide service these economies are unlikely to be realised. The market might evolve towards a single PRO having a nationwide monopoly or a series of PROs that specialised in particular geographic areas.

[44] The larger area has to, of course, also reflect more waste to be collected, sorted and recovered.

However, since the PROs are by definition under the single geographic market model to provide a nationwide service, such regional specialisation would be a breach of the PRO's license.

Openness and Transparency

It should be noted that under all the market arrangements set out above what is relevant is competition in the market for collection, sorting and recovery.[45] Here PROs can purchase these services using tendering procedures as well as negotiation.[46] As such they are able to use their buying power in order to receive favourable subsidy rates. These procedures should be open and transparent in order to ensure that members of the PROs, the Competition Authority and the DoECLG can monitor them so as to ensure that appropriate techniques are being used.

In the case of multiple exclusive geographic markets – as occurs in WEEE and batteries – yardstick competition might be employed to at least monitor the performance of the two PROs.[47] Since the two PROs are serving relatively homogeneous markets – by construction – and the subsidy rates for collection, sorting and recovery should be similar. If it is not and there are persistent differences due to the inefficiency of one of the PROs, then one option might be for the DoECLG to hold a competition for the PRO franchise for the poorly performing geographic market on the expiry of the PRO license. However, the case for yardstick competition should not be overstated.[48] Two PROs is almost certainly too small for it to work effectively, while expanding the number of PROs much beyond two is likely to raise collection, sorting and recovery costs substantially.

<u>How Should the Market for Household Waste Collection be Organised?</u>

It should be noted that the competitive conditions in the collection, sorting and recovery markets determine to a considerable degree the success of a PRO, irrespective of whether or not there are more than one PROs per waste stream, in securing competitive subsidy rates. In one important market – household waste collection – a 2012 government policy announcement is likely to raise the cost of the PRO using that collection service (e.g. the packaging waste stream).[49] To the extent it sets a precedent for collection, sorting and recovery in other waste streams, subsidy rates will be raised more generally across waste streams.

[45] Except for tyres which is concerned with tracking tyres through the supply chain.

[46] Negotiation is the case with Repak as it agrees subsidies with waste operators, partly reflecting the fact that it does not own the waste.

[47] For a discussion of yardstick competition see Baldwin and Cave (1999) and Vickers and Yarrow (1988). Under yardstick competition a regulator will compare the performance (e.g. efficiency) across several firms performing the same task (e.g. supplying water) and taking into account factors which may explain differences in performance (e.g. population density, topography, rainfall, division between residential and business customers, income levels and so on). The least efficient firms would be allowed to raise prices less than a more efficient firm, since the former can improve its efficiency through catch up to the most efficient firm.

[48] It might not be able to take into account all the differences between the two PROs to determine why one might be more efficient than the other. Furthermore, as Baldwin and Cave (1999, p. 243) note, there is a risk that if there are only a small number of firms they might collude to, for example, maintain high prices.

[49] Instead of favouring competitive tendering for household waste collection the DoECLG (2012b, pp. 29-30) decided in favour of competition in the market or side by side competition. The accompanying regulatory impact statement suggested that the better option was competitive tendering (DoECLG, 2012c), but policy-makers decided that practical problems precluded this option from being followed.

While household waste accounts for 33 per cent of the volume of packaging waste of the PRO, Repak (2010, p. 9), it accounts for 77 per cent of expenditure on subsidies. The evidence strongly suggests that when household waste is procured through tendering or a franchise bidding system collection costs are minimised. However, the government, although acknowledging this fact, has recently decided to retain the more costly competition in the market or side by side competition.[50]

Competition Amongst PROs: the Irish Experience

The degree of competition between PROs varies for the five waste streams in Ireland where there is a PRO (Table 6). In two instances, there is only one PRO: Repak Limited (Repak) for packaging and Irish Farm Films Producers Group for farm plastics. Self-compliance does not seem to offer a real alternative to joining either of these PROs.[51] As a result there is presently little or no competition for the provision of PRO services in these waste streams..[52] However, if the market for packaging waste is organised along the lines of a single national geographic market with centralised procurement for collection, sorting and recovery along the lines of the German model - as discussed above – then it is difficult to see how competition between ERP and Repak will drive down costs.[53] Packaging collection, sorting and recovery costs are common in terms of costs per tonne of waste collected across the PROs. This applies whether these costs are set by the State or jointly by the firms themselves.

For WEEE and batteries the competitive situation is different. Here there are two PROs which compete in the manner described above. The incentives are correct to drive down subsidy rates and thus membership fees. However, in the case of WEEE competition has taken time to develop. Initially, in 2005, the PROs were funded by visible environmental management costs (vEMCs) which were common across the State.[54] However, as this becomes less important competition is likely to increase. In the tyres waste stream, the entrant, Tyre Waste Management, has a small market share after four years operation.[55]

[50] For details see DoECLG (2012b; 2012c). It should be noted that while the Regulatory Impact Analysis demonstrates beyond doubt the advantages of the tendering system compared to the status quo or a slight variant thereof, the ostensible reason for rejecting this option, the difficulties of moving of introducing such a system, is neither convincing and nor thorough.

[51] In the case of packaging in 2010 there were only 106 self compliers with packaging waste recovered of 20, 196 tonnes or 3.2 per cent of packaging waste recovered in 2010. For details see EPA (2012, Table 19, p. 36 and Table 21, p. 39). There are no self compliers in farm plastics.

[52] ERP (2012, p. 4) applied to an approved body for packaging in 2009, but as yet no decision has been made by the DoECLG.

[53] It is this model that ERP are advancing. Based on a meeting with ERP 5 September 2012.

[54] This reflects the fact when the legislation for WEEE was first introduced in 2005 vEMCs were displayed for the consumer's information and that were included in the price that the consumer paid for a WEEE product. The vEMCs were common across the State. These charges were to take into account the stock of WEEE on the market. vEMC were subsequently abolished and the two PROs set their own membership fees which were not visible.

[55] TRACS (2011, pp. 10-11).

Table 6
Extended Producer Responsibility Schemes, by Waste Stream, Ireland, 2012.

Waste Stream	Extended Producer Responsibility Scheme (date of first approval)[a]	Comments & Current Developments
Waste electrical and electronic equipment (WEEE)	WEEE Ireland (2005) and ERP Ireland (2005) Current Scheme Licences Expire 2015	WEEE Ireland and ERP Ireland operate collection services in mutually exclusive geographically areas, membership fees based on costs of collection in that area, administration, awareness etc[b]
Batteries	WEEE Ireland (2008) and ERP Ireland (2008) Current Scheme Licences Expire 2013	WEEE Ireland and ERP Ireland operate collections services in mutually exclusive geographically areas, membership fees based on costs of collection in that area, administration, awareness etc
Packaging	Repak (1997) Current Scheme Licence Expires 2013	ERP Ireland made an application in 2009 to be an approved body for packaging. No decision has been made by the DoECLG.
Farm plastics	Irish Farm Films Producers Group (1997) Current Scheme Licence Expires 2015	-
End of Life Vehicles	No EPR scheme or provision in legislation. Each producer self complies (2006).	Producers were unable to agree on an EPR
Tyres (Data recording only on movement of waste tyres).	Tyre Recovery Activity Compliance Scheme (TRACS) (2007); Tyre Waste Management (2009) Current Schemes Licences Expire In 2013.	The vast majority of producers belong to TRACS

a. Schemes are usually approved by the Minister for the Environment, Community and Local Government for a specified period of time (e.g. five years) and may be subsequently renewed by the Minister.
b. The management costs for 5 of the 10 categories of WEEE were initially set as visible Environmental Management Costs (vEMCs) which were set at the same rate irrespective of PRO. These visible costs were formulated to cover the collective cost of collection and treatment of historic WEEE (pre-Aug 2005). However, for new WEEE (post-Aug 2005) and the other WEEE categories that were not subject to visible costs, the PROs do not necessarily charge the same price.

Source: DoECLG (2012a), websites of PROs, and legislation.

There are a number of indicators that provide information on the degree of competition between WEEE Ireland and ERP in the WEEE and batteries waste disposal market. We consider three. First, the extent of producers switching between ERP and WEEE Ireland. The evidence shows that there has been some, albeit limited in terms of numbers if not in the size of the producer, switching. Samsung and Shannonside Audio/Video moved from ERP to WEEE Ireland; while Microsoft

(European Division), P&G Professional, Richmond Electrical Wholesaler t/a JC Wholesale and Fastfit moved from WEEE Ireland to ERP. A variety of reasons were given for switching including financial and customer service considerations, being on the board of the PROs and a connection with one of the founders of ERP.[56] Second, ERP's market share of *WEEE* placed on the market has increased markedly, as evident from Table 7, from 11 per cent in 2006 to 33 per cent in 2011. In contrast, ERP's market share when measured in terms of numbers is much lower and shows no clear trend. In any event, the disparity between the two measures of market share implies that ERP's members are much larger, on average, than those of WEEE Ireland. In the case of *batteries*, ERP's market share of the tonnage of batteries placed on the market has declined, from 32 per cent in 2008 to 29 per cent in 2011, as has its market share in terms of numbers between 2010 and 2011 (Table 8).[57] However, ERP's market share measured in tonnage is much larger than in terms of numbers, suggesting ERP's members are bigger than those of WEEE Ireland. Finally, ERP and WEEE Ireland have different pricing models. For example, on WEEE ERP charge on the basis of collection/processed model, while WEEE Ireland charges based on the volume put on the market. In sum, it appears from three indicators that WEEE Ireland and ERP do compete with each other, with changes in market share and membership.

Table 7
Market Share of ERP and WEEE Ireland, Measured by Number of Members, Volume of Waste Put on the Market, WEEE, 2005-2011

Year	Number of Members ERP	Number of Members WEEE Ireland	Tonnage of WEEE placed on market ERP	Tonnage of WEEE placed on market WEEE Ireland
2005	12.7 %	87.3%	10.7 %	88.8 %
2006	11.6 %	88.4 %	22.0 %	77.3 %
2007	13.1 %	86.8 %	24.5 %	74.9 %
2008	n.a.	n.a.	27.7 %	72.1 %
2009	n.a.	n.a.	28.2 %	71.5 %
2010	12.0 %	88.0 %	28.8 %	70.9 %
2011	11.1 %	88.9%	33.0 %	66.8 %

Note: The percentage sum of tonnage of WEEE placed on the market by ERP and WEEE Ireland does not necessarily sum to 100 due to firms that decide to self-comply and some producers who have not yet made a decision whether to self-comply or join either ERP or WEEE Ireland. The percentage sum of the number of members refers only to members of the two compliance schemes and hence excludes self-compliers and the unassigned.
Source: Based on data provided by ERP and WEEE Ireland

Competition: What Role the State?

There is an important issue concerning the appropriate role of the State in relation to PROs, which may depend on the number of PROs. As noted above if there is more than one PRO then to a considerable degree of co-operation is likely to take place with respect to some key parameters of

[56] These reasons were based on discussions with ERP and WEEE Ireland.
[57] The data in Table 8 reflect the situation with respect to portable batteries only since the collection and recycling targets are set in terms of such batteries. WEEE Ireland also collects significant quantities of automotive and industrial batteries, ERP does not.

competition. However, the degree of co-operation is likely to vary considerably by the market arrangements employed with respect to a particular waste stream. There is little co-operation under the single national geographic market with decentralised procurement, but considerable co-operation where there is centralised procurement. While some co-operation is necessary in order to ensure that scale economies are realised and that consumer awareness campaigns are effective, there is danger that the scope for competition between the PROs will be compromised by co-operation which is not necessary and may lead to a breach of competition law.

Table 8
Market Share of ERP and WEEE Ireland, Measured by Number of Members, Volume of Waste Put on the Market, Portable Batteries, 2008 - 2011

Year	Number of Members ERP	Number of Members WEEE Ireland	Tonnage of batteries placed on market ERP	Tonnage of batteries placed on market WEEE Ireland
2008	n.a.	n.a.	32.2 %	67.2 %
2009	n.a.	n.a.	32.8 %	63.0 %
2010	13.3 %	86.7 %	31.4 %	66.9 %
2011	11.7 %	88.3 %	28.7 %	70.1 %

Note: The percentage sum of tonnage of WEEE placed on the market by ERP and WEEE Ireland does not necessarily sum to 100 due to firms that decide to self-comply and some producers who have not yet made a decision whether to self-comply or join either ERP or WEEE Ireland. The percentage sum of the number of members refers only to members of the two compliance schemes and hence excludes self-compliers and the unassigned.
Source: Based on data supplied by ERP and WEEE Ireland.

Irrespective of whether or not there is one or several PROs the European Commission (2005) has identified two sets of competition concerns with respect to PROs: first, so-called spillover effects that lead to competition concerns in the market in which the PRO members compete, in which the waste is generated. For example, a PRO ELV might be used to co-ordinate new car prices or allocate market share;[58] second, the PRO could adversely affect competition in a downstream waste market. For example, the PRO in packaging might bundle the collection of one form of packaging where there are strong network economies, with another where there are few if any, thus limiting competition in the latter market.

Mechanisms can be used in the design of PROs to ameliorate these concerns. PROs in Ireland are not for profit organisations run by professional staff with membership representatives and independent directors. However, they are not representative in the sense that the relevant trade body nominates somebody to the PRO board. Information concerning upstream markets, as measured by the volume of a particular product put on the market are not released to the PRO membership, but held in confidence. Furthermore in the case of WEEE and batteries all these data are recorded by a separate body, WEEE Register Society Limited, and not released to the two PROs. Hence it is difficult to see how the PRO could be used to co-ordinate upstream markets in an anti-competitive manner.

[58] However, some car marques, such as Citroen, have been able to co-ordinate car prices across dealers in Ireland without a PRO. For details see http://www.tca.ie/EN/Enforcing-Competition-Law/Criminal-Court-Cases/Citroen-Dealers-Association.aspx. Accessed 7 September 2012.

Turning attention to co-operation with respect to downstream markets as well as co-operation between PROs, which in both cases strays beyond that strictly necessary in accordance with minimising input costs, then like any other form of co-operation competition law applies and the remit of the Competition Authority comes into play. Under current competition law PROs have to self assess in order to determine whether or not they breach competition law.[59]

The Position of the Competition Authority

The Competition Authority (2011) addressed the issue of competition amongst different PROs or Producer Responsibility Schemes (PRS). It did this in response of the Competition Authority to the question, "Is there a need for greater competition among compliance schemes?" The question was posed as part of the DoECLG's consultation on *Towards New National Waste Policy*. The full Competition Authority response is reproduced in Box 2. The Competition Authority argues that PRO membership fees can be substantial, that it is important to drive down the costs in the non-traded sector, that more effective competition between PROs can contribute to driving down these costs and that monopoly provision of PRO services results in inefficiencies and poor standards because customers have no alternative.

The Competition Authority is correct to be concerned about the possible adverse effects of monopoly PRO providers. However, even with such providers there are mechanisms that can be used to create incentives for efficiency and high standards. PRO members do have the option of self-compliance. In the case of packaging, for example, IKEA self complies and does not belong to Repak. However, for smaller firms this may not be an option. In terms of holding PROs to account for their performance an opportunity arises when the PRO's license expires. In Section 5 we make some suggestions for how this might be achieved including, where appropriate, introducing competition for the market through a tendering process.

The Competition Authority does not, however, employ this approach to ensure a more efficient and customer responsive provision of PRO services. Instead it argues for greater competition between PROs and the introduction of switching codes to facilitate such competition.[60] The DoECLG, according to the Competition Authority, needs to set out a roadmap for more effective competition between PROs. A corollary is that the regulatory roles now assumed by PROs would be assumed by the DoECLG.[61] The Competition Authority sees the UK system for packaging, with its Packaging Waste Recovery Note (PRN), as a model for multiple PROs competing with each other.[62] Under the PRN system, licensed waste recovery operators or reprocessors issue PRNs based on the waste they recover/recycle. These PRNs are then used by obligated producers of packaging to demonstrate that they have met the required recovery/recycling target. The PRNs are tradable. However, there are several PROs or compliance schemes that act as intermediaries - as is the case in Ireland with respect to Repak – between the reprocessors and the producers. There are long-term contracts between

[59] This is not a requirement under their approval by the DoECLG.
[60] In Box 2 the Competition Authority states that it should be possible to use one PRO for its WEEE and batteries and another for its packaging waste. As the discussion in the paper makes clear, a producer is able to do so under the present PRO arrangements.
[61] This issue is discussed in Section 3 above.
[62] Based on discussions with the Competition Authority on 15 October 2012.

the PROs and the reprocessors, with only 12.5 per cent of PROs trading in the marketplace in 2009.[63] Furthermore, it should be recalled that Ireland is a much smaller market than the UK, so that the number of PROs is likely to be quite limited, with the result that any competition between PROs in the same waste stream is likely to be muted.[64] Hence, on balance, we favour the proposals put forward in the next section to deal with the problem of creating efficient and customer responsive compliance schemes, rather than abolishing the current system and replacing it with a PRN type regime.

Box 2
The Competition Authority's View on Competition and Producer Responsibility Organisations.

10. Currently there is very little competition among Producer Responsibility Schemes ("PRS") in Ireland. For example, Repak is the sole approved PRS in the packaging waste compliance market. There are two approved PRSs for … [WEEE] in Ireland, WEEE Ireland and European Recycling Platform Ireland.

11. Effective competition supports our national competitiveness by keeping Irish-based companies' costs down and our exported goods and services cheaper. For all a small open economy like Ireland, the key determinant of economic growth is international competitiveness. Waste compliance is one of the standard costs incurred by a huge number of businesses in Ireland. For example, it can amount to over a million euro per annum for some large retailers and brand holders to comply with the packaging PRS.

12. More effective competition between PRSs would drive the cost of compliance down for businesses and ultimately increase our national competitiveness. Monopoly provision of services results in inefficiencies and poor standards since customers have no alternative source of supply.

13. It is not clear that Ireland's current regulatory system for PRSs is designed to allow effective competition. To achieve effective competition, the Department would be required to plan out a road map to effective competition among PRSs. The Department would have to play a bigger role in dealing with many of the social and environmental issues involved. There would have to be some separation of operational and regulatory roles. None of the PRS operators in a competitive market should hold regulatory responsibilities. For example, in the packaging waste PRS market, Repak is responsible for achieving Ireland's targets. It is difficult to see how this responsibility could be shared among PRSs.

14. [Omitted since concerned with enforcement].

15. To encourage effective competition among PRSs, it is important not to limit switching between PRSs. This includes producers being able to use multiple PRSs for different types of waste. For example, a producer should, if he wishes, be able to use one PRS for its … [WEEE] and batteries waste and a different one for its packaging waste.

Source: Competition Authority (2011, pp. 2-3).

[63] The 12.5 per cent is taken from Matsueda and Nagase (2012, p. 671). Reference to long-term contracts is contained in this source, but see also the website of one of the compliance schemes, Valpak: http://www.valpak.co.uk/EnsureYourCompliance/PackagingWaste/HowTheSystemWorks.aspx. Accessed 4 February 2013. Valpak argue that such long term contracts enable them to "to secure a good price for our members."

[64] Even in the much larger UK market Walls (2004, p. 24) reports that one compliance accounted for 53 per cent of registered businesses with packaging compliance schemes. However, entry continues into this sector.

5. Addressing the Issues

This aim of this paper has been to address four issues distilled from the mandate set by the DoECLG for the competition paper.[65] These were identified in Section 2 as: first, the optimum number of PROs per waste stream; second, whether current arrangements discourage or encourage competition; third, issues relating specifically to WEEE and batteries concerning geographic market split and creating more PROs; and fourth, how Ireland ranks in terms of costs of PROs. The previous discussion should enable all of these issues to be addressed in this section, with the exception of the last where some new information will be introduced.

The Optimum Number of PROs and Implications for DoECLG Regulation of PROs

The first issue to be addressed is the optimum number of PROs that maximise operational efficiencies in each waste stream. In our discussion we deal not only with the issue of what the optimum number is likely to be, but also the implications of this for the DoECLG in regulating the various waste streams. This is a vitally important corollary of the choice of the optimum number of PROs in order to ensure that the operational efficiencies are realised.

The Optimum Number of PROs per Waste Stream

Given the economic characteristics of a waste stream, the optimum number of PROs depends on which market arrangement is most appropriate. Four market arrangements were discussed:[66]

- a single national geographic market with a single PRO, such as Repak for packaging;
- single national geographic market with multiple PROs and *centralised* procurement, such as packaging in Germany;
- single national geographic market with multiple PROs and *decentralised* procurement; and,
- multiple exclusive geographic markets, such as WEEE and batteries;

The burden of the analysis of the paper is that where a *single national geographic market is appropriate* the optimum number of PROs is one, rather than either of the alternatives with multiple PROs. Such an approach is merited because two or more PROs per waste stream compared with one does not appear to lead reduced collection subsidies, while there are other disadvantages in terms of increased transaction costs, holding the PRO(s) to account for meeting the environmental targets and co-ordinating education and awareness programmes. If, on the other hand, the appropriate market structure is *multiple exclusive geographic markets*, then it is possible to have more than one PRO. Given the small size of the Irish market and the probable non-linear increase in costs of three or more PROs, two would seem an appropriate number.

The difficult task remains of deciding whether a waste stream should be assigned to either the single national geographic market with one PRO category or the multiple exclusive geographic markets category. The following is considered to be a sensible assignment of waste streams:

[65] And the issue referred to earlier concerning the impact on competition of the introduction of one or more additional PROs in packaging.
[66] They are summarised in Table 2 above.

- packaging, ELV, farm plastics, and tyres should be a single national geographic market with one PRO; while,
- WEEE and batteries should be multiple exclusive geographic markets, with two PROs.

This allocation is made on the basis of the discussion above which has concentrated mainly on packaging, WEEE and batteries. There is, of course, no PRO for ELVs while that for tyres is concerned solely with collecting information.[67] Here, however, we have benchmarked the appropriate number of PROs based on the EU record. As shown in Table 1, there is a marked preference for one PRO for ELVs and tyres. The table is also consistent with the choices concerning the other three waste streams.

The Implications for Regulation of PROs

In considering the implications of the optimum number of PROs per waste stream for regulation by DoECLG, we consider first its application to waste streams where there is already one or more PROs, before turning our attention to proposals for PROs for waste streams from which they are absent. In other words, we will deal with the stock before turning our attention to the flow.

The *current market arrangements* for WEEE, batteries, and packaging are consistent with those proposed. In each case we are dealing with single PRO responsible for dealing with collection, sorting and recovery with respect to a given geographical area – either the State or a part of the State. Consistent with the discussion there is a need to ensure that these PROs are held to account by the DoECLG. It is proposed that these PROs should be evaluated against a number of criteria by the DoECLG when their license comes up for renewal. These would include but not be limited to:

- Were the targets met? and,
- Were the conditions in the approval complied with by the PRO?

If the PRO scores at least satisfactory on these criteria and can present a credible plan of how it will meet future targets, its license should be renewed. Any minor problems would be resolved between the DoECLG and the PRO. However, if the PRO fails to satisfy these criteria to at least a satisfactory level then that would trigger a competition or tendering process for the right to be the PRO. [68] The incumbent would be allowed to enter the contest.

The current market arrangements with respect to *tyres* are not consistent with those proposed. There are two PROs tracking tyre quantities and types through the supply chain leads from manufacturer, to wholesaler, to distributor, to tyre shop, to waste collector, leading to gaps in reporting and problems in reconciliation. This is needless fragmentation in data collection. It's a little having two Central Statistics Office collection data on unemployment and then reconciling the data to ensure consistency. It is not clear on what grounds the second PRO was licensed. There is,

[67] However, as noted above, RPS (2013a; 2013b) has recommended a movement towards PROs in both waste streams.

[68] There is a separate issue concerning the responsiveness of PROs to their membership. The paper prepared on corporate governance as part of the Review of the Producer Responsibility Initiative Model for Ireland includes suggestions for better corporate governance of PROs, which should lead to greater PRO transparency and responsiveness to the preferences of scheme members. See Philip Lee (2013) for details.

for example, no DoECLG press release at the time TWM was approved[69] nor is the DoECLG website discussion of waste management of tyres of assistance in this regard. Indeed, it only contains reference to one of the two PROs, TRACS, and omits any reference to the other, TWM.[70] Hence, unless there are compelling reasons of which we are unaware, there should be only one PRO for the tyres waste stream.

If there is to be a competition for the right to be a PRO one important issue concerns the treatment of the *contingency fund*. This has been funded by membership fees and charges.[71] In order to ensure a level playing field should it be necessary to consider switching the identity of the approved PRO some thought should be given to ring fencing this fund on an ongoing basis and passing it on to whosoever is successful in being awarded the right to be the PRO. It could be argued that it is the property of the members, rather than the PRO. Such a condition could be written into the license condition of the incumbent PRO when it is renewed and/or reviewed.[72]

In the case of packaging where there is the issue of a second PRO is currently live, the above approach should be used. In other words, only if Repak is deemed not to be satisfactory on the four criteria should there be a competition for the right to be the PRO. There should be no second PRO for packaging. As argued above, the case made by Grant Thornton (2010), on behalf of ERP, is not persuasive.

In terms of the creation of *new* PROs, the waste stream should be characterised as to the appropriate market arrangements. Then the assignment of the right to provide PRO services should be conducted using criteria similar to those set out above concerning the renewal of a PRO licence, which would include, but not be limited to: ability to meet the targets; experience/track record in PRO or similar activities; producer support; and plans to minimise subsidy costs and membership fees. At the present time such an approach is merited with respect to ELV and construction and demolition, where no PROs exists, but may in the future. It should also apply to tyres, should a PRO with collection, sorting and recovery services be introduced.

It could, of course, be argued that these proposals for the creation of new PROs runs counter to the current DoECLG policy of favouring industry led voluntary proposals for PROs.[73] However, this misses the point. There needs to be an open transparent process by which these arrangements are reached. While the outcome might well be the same (i.e. a producer led PRO), the use of a clear set of criteria with a formal request for submissions to be the PRO confers on the scheme winner legitimacy in terms of process.

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[69] TWM was approved in a letter dated 22 December 2009. For DoECLG press releases for December 2009 see: http://www.environ.ie/terminalfour/NewsSearch2.jsp. Accessed 26 September 2012.

[70] http://www.environ.ie/en/Environment/Waste/ProducerResponsibilityObligations/Tyres/. Accessed 26 September 2012.

[71] In the case of WEEE, as noted above, a producer recycling fund has been built up to treat historic waste through visible fees paid by the consumer, rather than through membership fees and charges. See WEEE Ireland (2012, pp. 12-13).

[72] Philip Lee (2013, pp. 12-13) contains a discussion of the contingency fund which would not seem inconsistent with the discussion presented here.

[73] http://www.environ.ie/en/Environment/Waste/ProducerResponsibilityObligations/. Accessed 11 September 2012.

PRO Competition: Encouraged or Discouraged?

In considering whether current arrangements encourage or discourage competition attention needs to be paid to the entry conditions and competition between PROs, although as we shall see the line between the two can become blurred. The first is concerned with competition from PROs outside the waste stream, the latter competition between PROs that are currently offering services in a particular waste stream. However, before addressing these issues it should be noted that the major thrust of the paper is that there is limited scope for competition in the supply of PRO services.

Barriers to Entry

Barriers to entry refer to conditions or obstacles that inhibit firms from challenging the position of existing incumbent firms. The entrants can be either new firms or already existing firms. The lower the barriers to entry the easier it is for an entrant to challenge incumbents. The threat of entry under such conditions provides an incentive for the incumbent to be efficient and responsive to customers. If, however, barriers to entry are high then entrants are much less likely to enter. Incumbents can charge prices above costs and have less incentive to minimise costs and respond to consumer preferences.

In order for a PRO to enter a particular waste stream and offer its services to members it requires licence. No guidance is available from the licensing authority, DoECLG, on the criteria to be applied for approving a second or subsequent PRO, while the legislation provides little assistance. Furthermore there appears to be a lack of consistency in the DoECLG approach for granting PRO licenses. At one extreme there is considerable delay in the DoECLG in coming to a decision. In the case of ERP's packaging application for PRO status, the application has been outstanding since 2009 and no resolution has been achieved to date. In contrast, the application to be a second PRO in tyres was processed in less than six months.[74] Notwithstanding that there may be valid reasons for the delay with respect to ERP's application,[75] such uncertainty and lack of clarity constitutes a regulatory barrier to entry.

Barriers to entry can also be created by an incumbent PRO in order to discourage entry. Hence even if an entrant is able to secure approval from the Minister – a necessary condition of entry – it may not be sufficient. The incumbent may demand excessively long notice periods from its members so as to make it difficult for a new entrant to gain business by persuading these members to switch PROs. As noted above PROs have to establish contingency funds. A question arises as to whether or not a producer that switches to a new entrant has to make a fresh contribution to the entrant's contingency fund or whether they are able to transfer a portion of the contingency fund of the incumbent, in proportion to their contributions. Failure to make such an arrangement is likely to inhibit entry. Finally, the incumbent might have access to certain intellectual property, which is

[74] Tyre Waste Management Ltd was approved by the Minister in December 2009. http://www.twm.ie/. Accessed 10 September 2012. The application was made in September 2009, based on information provided by the DoECLG.

[75] These reasons include: the DoECLG sought advice from the Competition Authority in January 2010, but the formal advice was not received until April 2011; the financial and other crisis which meant that the current PRO model needed to be re-examined; and, the launch in June 2012 of the Review of the Producer Responsibility Initiative Model for Ireland. (Based on information provided by the DoECLG).

important for the success of any PRO in the particular waste stream and may not license to the entrant on fair and reasonable terms and hence discourage entry.

Barriers to Mobility

Barriers to mobility refer to conditions or obstacles that prevent or inhibit the ability of a firm, particularly but exclusively a new entrant, to gain market share and hence to successfully challenge the incumbent(s). These barriers make it difficult for one producer to switch to another. In order to facilitate competition between the PRO there should be as few a barriers to switching as possible. The discussion in the previous section highlighted some of the barriers to switching which may exist. In terms of WEEE and ERP in WEEE and batteries switching appears to be occurring while in the case of tyres there are no barriers to switching, perhaps not surprising since for this waste stream there is no contingency fund, while the PRO has no responsibility for collection, sorting and recovery.

Resolving Barriers to Entry and Mobility

Removing unwarranted barriers to entry and mobility so that competitive forces can be allowed to operate such that costs are minimised and PROs are responsive to members preferences can be achieved in two ways. Under competition law some of PRO practices may be challenged. The incumbent PRO is a monopolist protected from entry until the Minister approves a new PRO. Attempts to erect barriers to entry could, for example, be challenged as an abuse of a dominant position. However, the disadvantage with such intervention is that it is retrospective and time consuming. Hence an alternative is for the DoECLG to specify, in approving a PRO, that certain practices are prohibited (e.g. excessively long termination periods) while at the same taking steps to deal with the issue of the contingency fund such as that set out in the previous section. Indeed, the DoECLG might develop a Switching Code in consultation with the Competition Authority. Of course, setting clear criteria for the granting of a PRO is the responsibility of the DoECLG.

<u>WEEE and Batteries: Geography and More PROs</u>

On the issue of the geographic division and scope for additional PROs in the case of WEEE and batteries the conclusions are straightforward. On the latter issue given the discussion of the paper and the conclusion with respect to the optimum number of PROs, it is not at all obvious that the advantages outweigh the disadvantages of three or more PROs involved in WEEE and/or batteries. In terms of the former issue, so long as, (i) the geographic division reflects, in a rough and ready way, the market share of WEEE Ireland and ERP and, (ii) the geographic areas for which the PROs are responsible for in terms of collection, sorting and recycling are homogeneous,[76] we see no need to question the division. The only caveat is that ERP is responsible for the collection, sorting and recovery of waste in two separate areas: one in the border area (i.e. Monaghan, Cavan, Meath, Louth, Fingal for WEEE and batteries, plus Leitrim and Westmeath for WEEE) and the other in the south west (i.e. Clare, Limerick City and County, Kerry). If lower subsidy rates were realised from

[76] With respect to the major parameters that are likely to determine collection, sorting and recovery costs, such as urban/rural spilt, population density, and proximity to the border to take account of suspected leakage on the part of consumers bringing it to Northern Ireland. These factors were used, according to ERP, in allocation the geographic areas to be served by it and WEEE Ireland.

having one continuous area to serve, then some thought might be given to redrawing the boundaries to realise these lower subsidy rates. However, it should be noted that ERP is already responsible for collecting, sorting and recovering WEEE and batteries in Northern Ireland.

Benchmarking the Performance of PROs in Ireland

Benchmarking the performance of PROs in Ireland in terms of membership fees can be achieved by a comparison of the same charges in other Member States. These typically take the form of a comparison of fees per tonne of waste. There are, however, a number of well known problems with these comparisons, which have been outlined by Watkins *et al* (2012, p. 106):

- The schemes cover a varying percentage of the costs of collecting and recycling packaging. In Austria, for example, the subsidy under the packaging scheme covers a 100 per cent of the costs while in the UK it covers only 5-10 per cent, with Ireland in between these two estimates (Bio, 2012, Table 5, pp. 20-21). Hence, other things being equal, subsidies for collection, sorting and recovery will be lower in the UK than either Austria or Ireland;
- Because Member State targets vary and because fees tend to relate to packaging placed on the market, where targets are lower the fees per unit of packaging placed on the market will also be lower;
- The use of different collection systems within schemes (partly reflecting different targets), and the differing cost profiles of these collection systems. In Germany household packaging is collected using a special purpose built system, whereas in Ireland household packaging is collected as part of the green bin collection. Hence, other things equal, German collection costs will be higher than those in Ireland; and,
- Schemes in some Member State cover household, commercial and industrial packaging waste, whilst some cover only household and commercial, while others only cover household packaging waste.[77]

Although the discussion refers to packaging it can be applied, *mutatis mutandis*, to other waste streams (Bio, 2012).

An examination of fees across all EU-27 Member States for which data is available, based on Bio (2012), yields very few valid comparisons due to either a small sample size (e.g. WEEE, ELV, batteries) and/or else the data are not comparable (e.g WEEE, ELV, batteries) across Member States.[78] One exception is packaging, where PRO fees range from €8-175 per tonne for paper across 23 Member States, with Ireland recording a charge of €23 per tonne, towards the lower end of the spectrum. Ireland's ranking with respect to packaging is consistent with the results of a similar exercise undertaken for Repak by Indecon (2010a, pp. 37-38) for the EU-15. In sum, Ireland appears for the one waste stream where comparable data exists to be low cost in terms of comparison with other Member States. However, care need to be taken in interpreting this result for a number for the reasons set out above.

[77] This is the case for Belgium as discussed in footnote 13.
[78] Bio estimates of costs are maximum average fee, based on latest data available as of 11 December 2012.

6. Conclusion

The object of this paper has been to address the role of competition in securing a more efficient and effective collection, sorting and recovery of waste streams such as WEEE, packaging, batteries and so on, so as to improve the competitive position of firms and business that need to pay for such services, while at the same time meeting binding EU environmental targets. Success should not only contribute to the success of such firms through lower input costs but also generate extra jobs and investment.

The vehicle through which collection, sorting and recovery of waste takes place is a producer responsibility organisation or PRO. It acts on behalf of individual firms in the collection, sorting and recovering waste as well as meeting the targets and in return the PRO charges a membership fee based on tonnage of waste. In most markets more competition is associated, albeit crudely, with the number of providers. Hence, as a first approximation, it could be argued more PROs should lead to more competition. Environmental targets are met with lower costs of collection, sorting and recovery. A win-win situation.

We consider this view to be mistaken. This conclusion was reached only after a careful examination of the economics of the supply of collection, sorting and recovery services supplied through a PRO. It is unlikely that licensing more PROs with a national remit will lead to better outcomes in terms of cost. Instead, costs are likely to be higher while the increased difficulty of monitoring the PROs is likely to make reaching the targets more difficult. This does not mean that competition cannot be used to create lower collection, sorting and recovery costs, through, for example, tendering. When market conditions suggest that only one national PRO is appropriate then competition for the market is appropriate. Where market conditions suggest that multiple exclusive geographic markets, usually two, are appropriate, then competition is possible. What needs to be done is create mechanisms to ensure competition takes place, while at the same time retaining the advantages of having a single firm responsible for meeting targets as well as responsibility for collection, sorting and recovery.

Annex A

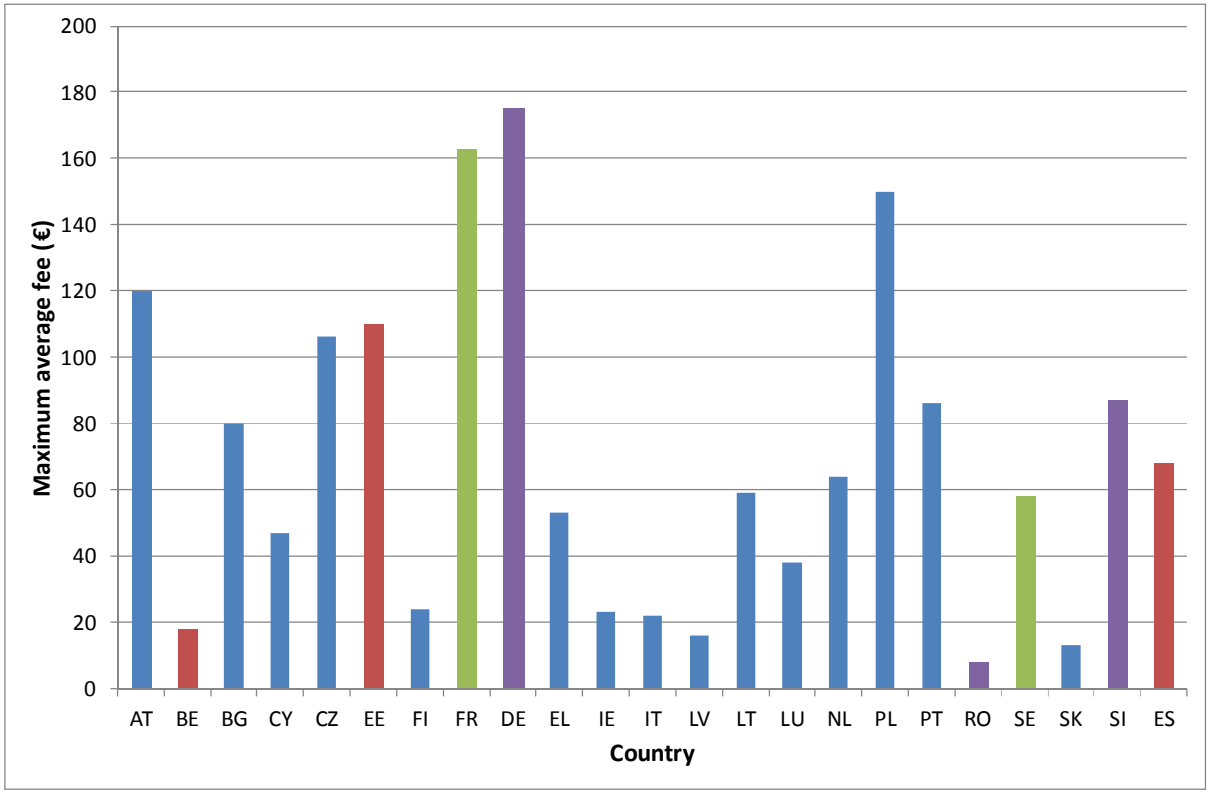
Glossary of Acronyms

AT = Austria
BE = Belgium
BG = Bulgaria
CY = Cyprus
CZ = Czech Republic
DE = Germany
DoECLG = Department of the Environment, Community and Local Government
EE = Estonia
EL = Greece
ELV = End of Life Vehicles
EPA = Environmental Protection Agency
EPR = Extended Producer Responsibility
ERP = European Recycling Platform Ireland
ES = Spain
EU = European Union
FI = Finland
FR = France
IE = Ireland
IT = Italy
LV = Latvia
LT = Lithuania
LU = Luxembourg
Minister = Minister for Environment, Community and Local Government
NL = Netherlands
OECD = Organisation for Economic Co-operation and Development
PL = Poland
PRN = Packaging Waste Recovery Note
PRO = Producer Responsibility Organisation
PT = Portugal
RO = Romania
SE = Sweden
SI = Slovenia
SIMI = Society of the Irish Motor Industry
SK = Slovakia
TRACS = Tyre Recovery Activity Compliance Scheme Limited
TWM = Tyre Waste Management Scheme
WEEE = Waste Electrical and Electronic Equipment
WRS = WEEE Registry Society Limited

Annex B

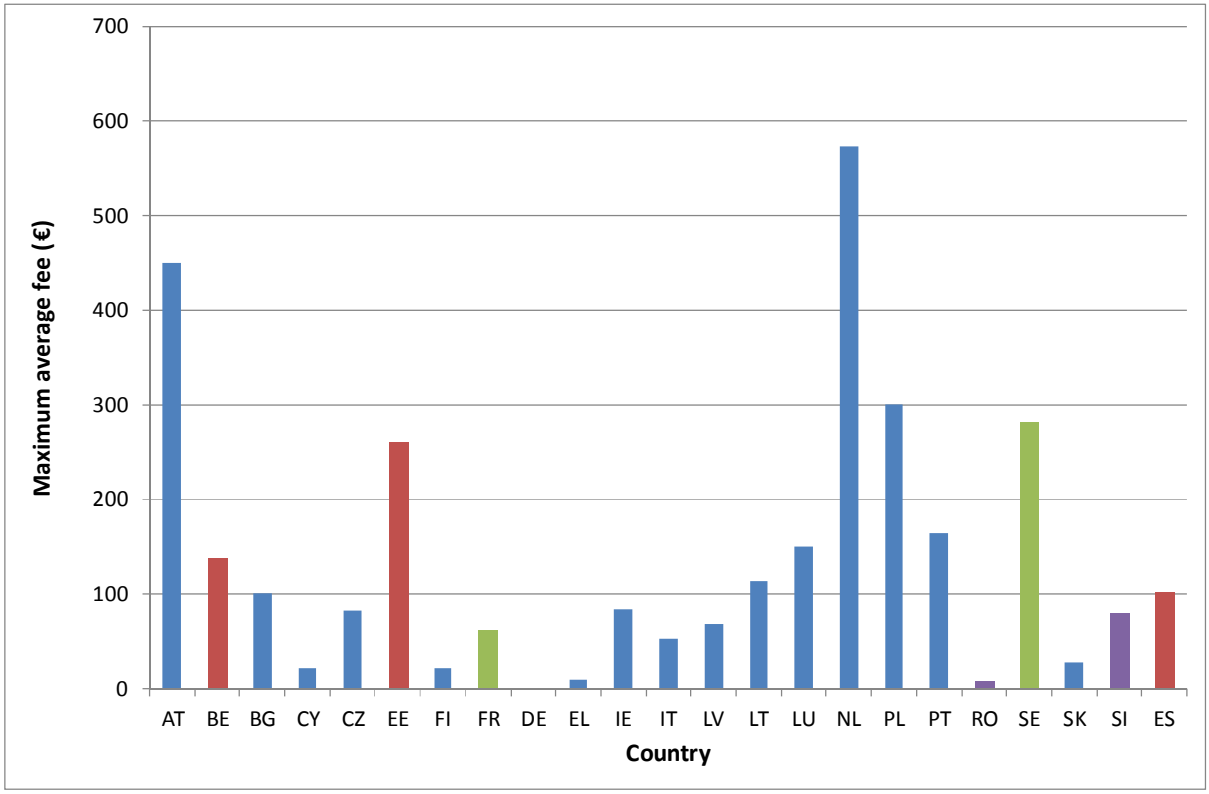
Supplementary Figures on the Relationship between the Number of PROs per Waste Stream and Cost per Tonne for Collection, Sorting and Recovery

Figure B.1
Maximum Average PRO Fee Per tonne and the Number of PROs, Paper, by Member State, 2012



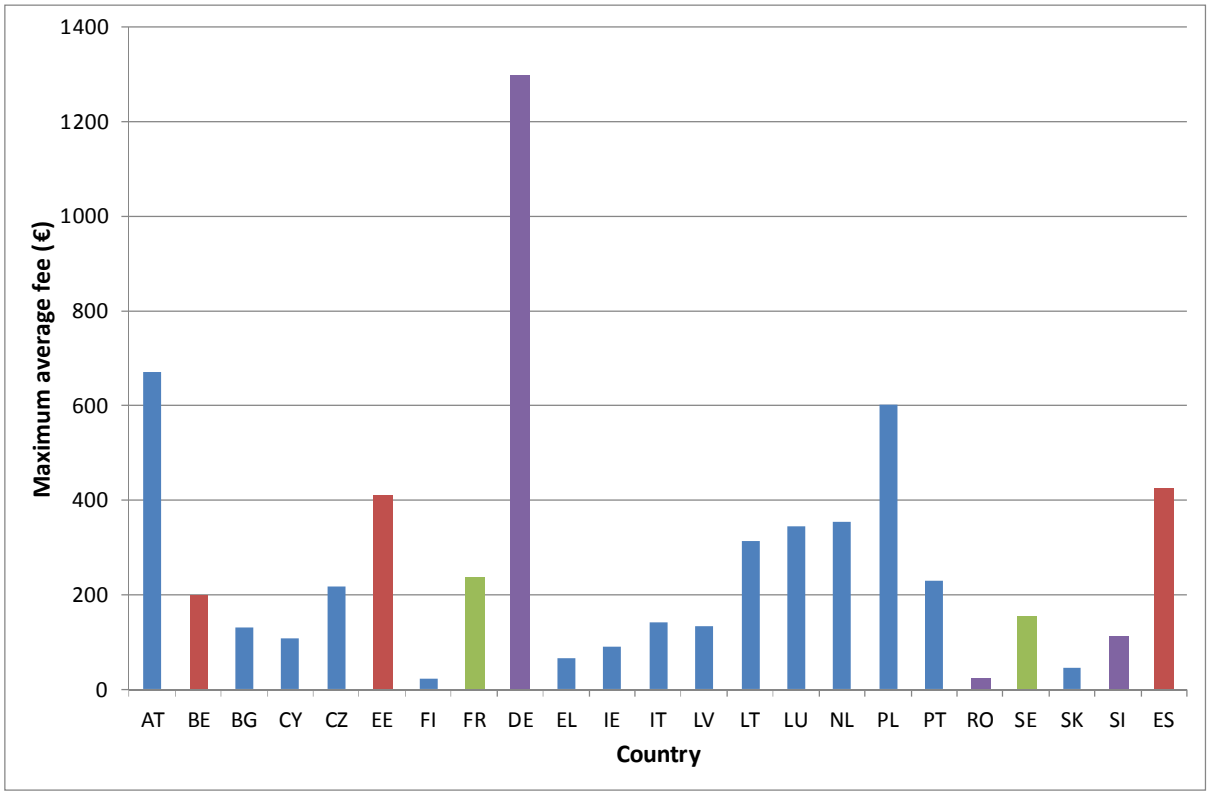
Key: Blue = one PRO per waste stream; Red = two PROs per waste stream; Green = three PROs per waste stream; Purple = four or more PROs per waste stream. For Member States see Annex A.
Source: Bio (2012, Table 4, p. 19; Annex 4, pp. 62-68).

Figure B.2
Maximum Average PRO Fee Per tonne and the Number of PROs, Aluminium, by Member State, 2012



Key: Blue = one PRO per waste stream; Red = two PROs per waste stream; Green = three PROs per waste stream; Purple = four or more PROs per waste stream. For Member States see Annex A.
Source: Bio (2012, Table 4, p. 19; Annex 4, pp. 62-68).

Figure B.3
Maximum Average PRO Fee Per tonne and the Number of PROs, Plastic, by Member State, 2012



Key: Blue = one PRO per waste stream; Red = two PROs per waste stream; Green = three PROs per waste stream; Purple = four or more PROs per waste stream. For Member States see Annex A.
Source: Bio (2012, Table 4, p. 19; Annex 4, pp. 62-68).

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APPENDIX E: USE OF RISKS MANAGEMENT TECHNIQUE TO DETERMINE THE LEVEL OF CONTINGENCY FUNDING

INTRODUCTION

Organisations of all types and sizes face internal and external factors and influences that make it uncertain whether and when they will achieve their objectives. The effect this uncertainty has on an organisation's objectives is referred to as “risk”.

For Producer Responsibility Organisations (PROs) whose objectives are to meet the obligations of producers under European and National legislations, these risks relate mainly to a disruption of service i.e. organisation (financially or physically) of the collection and treatment of certain waste streams.

The operation of PROs requires good financial planning skills to match income with projected expenditure in order to meet the prescribed targets. Insufficient income or costs exceeding income can prevent a PRO meeting set targets.

If the objectives of the PROs are not met, the DECLG or the local authorities might have to take over the liabilities associated with the waste management of the products targeted by the particular PRI. There may also be financial penalties due to Ireland not meeting its EU targets for recycling and recovery, pollution and public health hazards. Finally the poor performance of the waste management system may have a negative impact on Ireland’s overall image.

In order to mitigate these risks, one of the current approval conditions of the compliance schemes requires that a contingency funding is held in reserve by the PROs. The fund is the equivalent to approximately one year of the PROs operational costs. The contingency fund is built up by the PRO from the membership dues. This fund can then be set against recycling costs if the scheme was to cease operating.

The potential **use of Risk Management Techniques** was examined with the view of reducing or negating the need for the current level of contingency reserve.

In developing a Risk Management Technique approach and methodology, the *NSAI Irish Standard I.S. ISO 31000:2009 Risk management – Principles and guideline* was used as the basis. This standard states: organisations manage risk by identifying it, analysing it and then evaluating whether the risk should be modified by risk treatment in order to satisfy their risk criteria. This document describes the systematic and

logical process in detail, this has been modified for the purpose of this task and a specific methodology is outlined below.

The risk management process is part of a wider framework to manage to create value as shown in Figure E1.

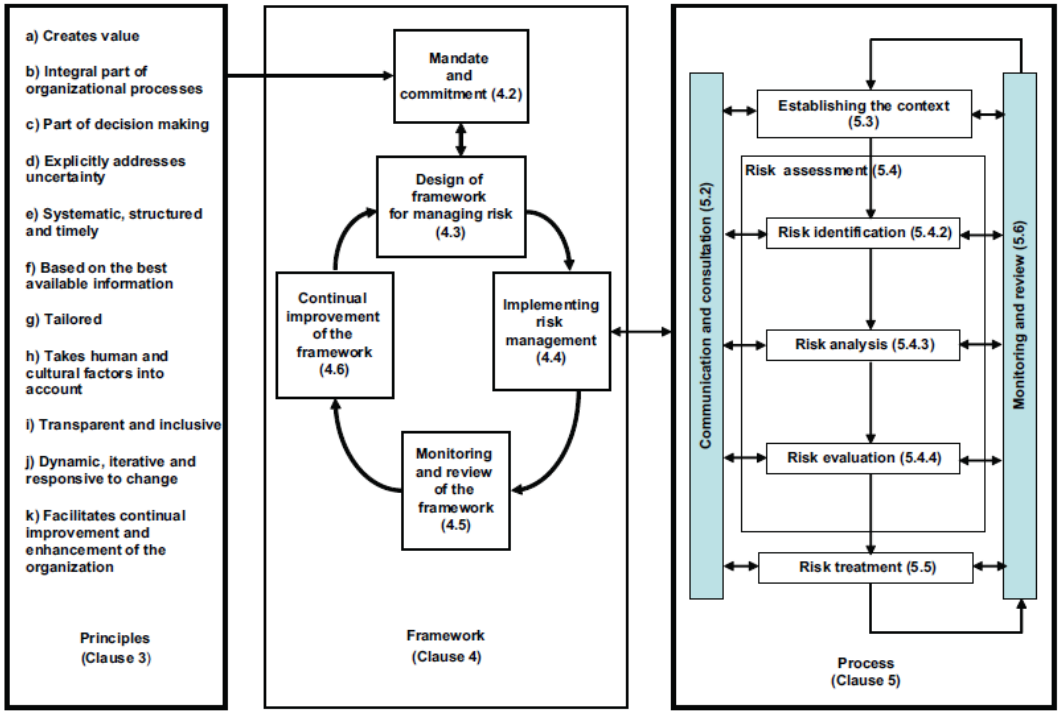

Figure E1: Relationships between the Risk Management Principles, Framework and Process (from I.S. ISO 31000:2009)

The risk management process can be applied by the two main organisations involved in the producer responsibility initiatives:

- The DECLG which has overall responsibility for monitoring the PROs and for the achievement of a high quality environment with effective environmental protection. The DECLG is concerned by the effect of a PRO not meeting their objectives such as the liabilities associated with the waste management of the products, meeting EU targets and reducing pollution or health hazards etc..

- The PROs who coordinate the Producers Responsibility activities and whose objectives are set by the schedule of conditions issued by the DECLG.

While the DECLG and the PROs can apply the risk management process, the DECLG is ultimately responsible as it will have to oversee operations in the case of PRO failure.

In terms of the possibility of reducing the level of contingency fund held, the DECLG should do so after a PRO had satisfactorily demonstrated that it has established a greater level of strategic risk management. Accordingly, the following measures could be used:

(a). Each PRO would establish a Risk Management Sub-Committee who would receive suitable training,

(b). This sub-committee would produce a risk management strategy and a risk register which would be submitted to their main Board for approval.

(c). This would be submitted to this DECLG and it would become one of the issues that a PRO would report on annually.

(d). It should also be noted that if risks increase then the fund could increase back to the original amount.

If the PRO applies the risk management techniques to determine the level of contingency funding it should set aside, the input and the process will have to be reviewed by the DECLG to prevent any risk of abuse.

The DECLG can also use this approach to identify specific risks associated with certain waste streams. The risks identified by the DECLG can be mitigated by a number of means. For example this overall review of PRIs in Ireland is a way to mitigate risk by identifying what's working and what's not working in the current producer responsibility model and initiatives.

In order to illustrate this approach, we have carried out the risk management process for the existing PRIs.

RISK IDENTIFICATION

For the purpose of this exercise, which is to demonstrate that risk management techniques can be used to assist in determining the level of contingency fund required, we have focused on what is perceived as the main risks contributing to the PROs not meeting their objectives.

- Financial difficulties: the PRO income is too low or its expenditure too high.
- Technical difficulties: the PRO does not have the ability to execute its programme to meet the objectives of the PRI.

The risks identified above have been summarised in the risk Register in Table E1. Each risk may not necessarily apply to all of the PRI areas.

Table E1: Risk Register

Risk Number	Potential Failure Mode / Risk
1	Financial difficulties
2	Technical difficulties

RISK ANALYSIS

This is the process of understanding the nature of the risk and determining the level of risk.

It involves consideration of the causes and sources of risk, their positive and negative consequences, and the likelihood that those consequences can occur.

These risks will come to fruition for the following reasons:

- **Insufficient income to the compliance scheme** from the producers, this could be due to internal factors (such as bad financial planning or setting the producers fees too low) or external factors such as funding not being available because of a high level of non-compliance by obligated businesses.
- **Costs exceed the compliance scheme forecast and income**. There are a number of reasons which may affect costs and it is likely to be the main area of uncertainly. These reasons include:

- Presence of historic stockpiles, thus leading to increased quantities collected or to be collected,
- Import of materials from Northern Ireland leading to increased quantities collected or to be collected not covered by producers funding,
- Change in the value of recovered materials leading to increased treatment costs.
- New collection and treatment targets which will increase the unit cost of collection and/or treatment.
- Poor procurement procedures or management of sub-contractors leading to increased costs.

- **Sub-contractor (waste operator) failure** to meet its contractual obligation because the technical and financial capacity is not at the level required. This may impact the ability of the PRO to meet its collection and treatment target.

Part of the risk analysis is to rate these risks. One of the agreed methods is to use a numerical value or descriptor to specify consequences and their likelihood of occurrence.

For example, the Tables E2 and E3 provide a rating system which can be applied to each risk for occurrence and severity.

In **rating for occurrence**, we have considered if:

- Was there a previous occurrence where the risk realised?
- The DECLG and PRO existing systems to manage the risks
- Probability of this risk occurring again / at all

Table E2: Rating for Probability of Occurrence

Rating	Description	Likelihood of Occurrence (%)
1	**Low**	<10%
2	**Medium**	10-25%

3	**High**	>25%

In **rating for severity** we have considered the following effects:

- Financial liabilities associated with the waste management: this will be a function of the quantities and cost per tonne of waste collection and treatment. This is determined in part by the type of waste (e.g. hazardous or otherwise) and the current waste management practices.
- Financial penalties due to Ireland not meeting targets for collection, recycling and recovery: this is determined by the presence of EU targets and Ireland's effort required to meet these targets.
- Financial liabilities associated with pollution or health hazards: Again this will be linked to the extent of the problem and the type of waste in question (i.e. hazardous or otherwise).

In this case, a financial cost is linked to severity to give an economic dimension, but this is purely indicative.

Table E3: Rating for Severity

Rating	Description	Financial Cost (€'000's)
1	**Low**	< 1 million
2	**Medium**	> 1-5 million
3	**High**	> 5 million

The **risk rating** is determined by multiplying the rating for probability of occurrence by the rating for severity.

Table E4 to E8 list all of the risks for each of the PRI areas with a compliance scheme. Text on the probability of occurrence of this risk and the potential severity if such a risk did occur is presented under each area heading. These tables should be updated in line with the risk register on a regular basis.

RISK EVALUATION

The risk evaluation is the process of comparing the results of the risk analysis with a risk criteria to determine whether the risk (or its magnitude) is acceptable.

If the risk is not acceptable, the risk must be designed out by putting controls in place.

Table E9 contains all of the risks identified throughout the risk assessment exercise. It shows at a glance how each of the PRI areas relate to each other under those risks listed in the risk register.

This risk ranking details the rating of each risk per PRI area so that the ones which need the most attention are obvious.

Table E9: Risk Ranking

Risk Number	Description	Packaging	WEEE	Batteries	Farm Plastics	Tyres
1	Financial difficulties	9	9	6	3	2
2	Technical difficulties	3	9	9	2	N/A

Table E4: Packaging PRI Risk Analysis

Risk ID	Description	Potential Failure Mode - What happens to make this risk eventuate?	Potential Failure Effects - What impact does it have on the Scheme?	Basis for Severity Rating - describe what could happen	Severity	EQUIVALENT	Basis for Occurrence Rating - for what reason is this rating chosen.	Occurence	EQUIVALENT	Current Controls - what is in place at the moment to stop this event occuring	Risk rating (occurence x severity)
1	**Financial difficulties**			**EU Targets which are wellmet, waste is present in large quantity but is mostly not hazardous,**							**9**
		Bad financial planning or setting the level of producers fees too low,	PRO will not be able to fund a proportion or all of the collection and treatment	Risk could have serious impact due to EU targets and large quantities	High	3	Has occurred previously in other waste streams, but Repak is a long established PRO with experienced personnel	Low	1	Financial plan required by the DoECLG as part of the application, DECLG requires minimum technical capacity from PRO, financial health monitored by DoECLG	3
		Funding not available because of a high level of non-compliance by obligated businesses	PRO will not be able to fund a proportion or all of the collection and treatment	Risk could have serious impact due to EU targets and large quantities	High	3	Large number of obligated businesses, large estimated non-compliant obligated businesses, possibility for self-compliance. Repak's expenditure has exceeded income since 2009	High	3	DECLG can address issue as part of wider responsibilities	9
		Presence of historic stockpiles collected leading to increased quantities collected or to be collected,	PRO will not be able to fund a proportion or all of the collection and treatment	No stockpile	Low	1	Has occurred previously in other waste streams.	Medium	2	N/A	2
		Import of materials from Northern Ireland leading to increased quantities collected or to be collected not covered by producers funding,	PRO will not be able to fund a proportion or all of the collection and treatment	No import from NI	Low	1	Packaging waste travels, however will need further economic incentives and absence of checks by PRO	Medium	2	N/A	2
		Change in the value of recovered materials leading to increased treatment costs.	PRO will not be able to fund a proportion or all of the collection and treatment	Value of recovered materials important to value chain, landfill tax mitigate against this. 2008 crash did not affect recycling rate and rate of subsidy,	Low	1	Siginificant volatility in market, potential decrease to no value, however subsidy system, landfill tax mitigate against this	High	3	PRO to follow market trends and factors affecting the value of recyclables	3
		New collection and treatment targets which will increase waste collection and treatment costs.	PRO will not be able to fund a proportion or all of the collection and treatment	Potential future targets from EU, but there be will time to adapt and recovery rate is already high	Low	1	Very likely that the EU Packaging Directive will be reviewed	High	3	DECLG and PRO use European links to identify new developments early.	3
		Poor procurement procedures or management of sub-contractors leading to increased cost	PRO will not be able to fund a proportion or all of the collection and treatment	No procurement, only subsidy	Low	1	No procurement, only subsidy	Low	1	DECLG requires minimum technical capacity from PRO	1
2	**Technical difficulties**	The waste contractor is bankrupt or must cease operation because of technical or legal reason	PRI waste will not be collected or treated	Not a major risk as the system is based on subsidies.	Low	1	Likely to occur however If one operator fails, another will take over	High	3	DECLG requires minimum technical capacity from PRO	3

Table E5: WEEE PRI Risk Analysis

Risk ID	Description	Potential Failure Mode - What happens to make this risk eventuate?	Potential Failure Effects - What impact does it have on the Scheme?	Basis for Severity Rating - describe what could happen	Severity	EQUIVALENT	Basis for Occurrence Rating - for what reason is this rating chosen.	Occurence	EQUIVALENT	Current Controls - what is in place at the moment to stop this event occuring	Risk rating (occurence x severity)
1	**Financial difficulties**			**EU Targets which are met however new targets will be challenging, waste is present in quantity and include hazardous components,**							**9**
		Bad financial planning or setting the level of producers fees too low,	PRO will not be able to fund a proportion or all of the collection and treatment	Risk could have serious impact due to EU targets, quantities and hazardous components	High	3	Has occurred previously in other waste streams. One PRO has significant reserve, the other has limited reserve	High	3	Financial plan required by the DECLG as part of the application, DECLG requires minimum technical capacity from PRO, financial health monitored by DECLG	9
		Funding not available because of a high level of non-compliance by obligated businesses	PRO will not be able to fund a proportion or all of the collection and treatment	Risk could have serious impact due to EU targets, quantities and hazardous components	High	3	Limited non-compliant obligated businesses, no self-compliance allowed	Low	1	DECLG can address issue as part of wider responsibilities	3
		Presence of historic stockpiles collected leading to increased quantities collected or to be collected,	PRO will not be able to fund a proportion or all of the collection and treatment	Limited or no quantities resulting in limited costs	Low	1	Has occurred previously in other waste streams. No stockpile, but possible technological changes leading to product replacement	Medium	2	N/A	2
		Import of materials from Northern Ireland leading to increased quantities collected or to be collected not covered by producers funding,	PRO will not be able to fund a proportion or all of the collection and treatment	Limited or no quantities resulting in limited costs	Low	1	Has occurred previously in other waste streams.Limited import of WEEE	Medium	2	N/A	2
		Change in the value of recovered materials leading to increased treatment costs.	PRO will not be able to fund a proportion or all of the collection and treatment	Value of recovered materials important to value chain, effect on WEEE leakage	Medium	2	Cyclical every 2-3 years. Siginificant volatility in market, little mitigation,	High	3	PRO to follow market trends and factors affecting the value of recyclables	6
		New collection and treatment targets which will increase waste collection and treatment costs.	PRO will not be able to fund a proportion or all of the collection and treatment	Future targets from EU will require to collect an additional 10,000 to 20,000 tonnes of WEEE	Medium	2	Future targets from EU, but there will time to adapt	High	3	DECLG and PRO to implement measures to meet collection targets.	6
		Poor procurement procedures or management of sub-contractors leading to increased cost	PRO will not be able to fund a proportion or all of the collection and treatment	Unlikely to exceed 1€ million	Low	1	Has occurred previously in other waste streams	Medium	2	DECLG requires minimum technical capacity from PRO. Experienced procurement team, Good procurement procedure	2
2	**Technical difficulties**	The waste contractor is bankrupt or must cease operation because of technical or legal reason	PRI waste will not be collected or treated	Unlikely to exceed 1€ million	Medium	2	Has occurred previously in the waste management industry.	Medium	2	A number of waste operators could replace bankrupt contractor	4
		Leakage of waste from the current system	PRI waste not collected or treated by authorised channels and not contributing to target achievement	Risk could have serious impact due to EU targets, quantities and hazardous components	High	3	Concerns 50% of WEEE	Certitude	3	DECLG can address issue as part of wider responsibilities	9

Table E6: Batteries PRI Risk Analysis

Risk ID	Description	Potential Failure Mode - What happens to make this risk eventuate?	Potential Failure Effects - What impact does it have on the Scheme?	Basis for Severity Rating - describe what could happen	Severity	EQUIVALENT	Basis for Occurrence Rating - for what reason is this rating chosen.	Occurence	EQUIVALENT	Current Controls - what is in place at the moment to stop this event occuring	Risk rating (occurence x severity)
1	**Financial difficulties**			**EU Targets which are met however next targets will be challenging, waste is present in small quantity but is hazardous,**							6
		Bad financial planning or setting the level of producers fees too low,	PRO will not be able to fund a proportion or all of the collection and treatment	Although quantities are small, risk could have serious impact due to EU targets and hazardous content of batteries	High	3	Has occurred previously in other waste streams. One PRO has significant reserve, the other has limited reserve	Medium	2	Financial plan required by the DECLG as part of the application, DECLG requires minimum technical capacity from PRO, financial health monitored by DECLG	6
		Funding not available because of a high level of non-compliance by obligated businesses	PRO will not be able to fund a proportion or all of the collection and treatment	Although quantiites are small, risk could have serious impact due to EU targets and hazardous content of batteries	Low	1	Limited non-compliance from obligated businesses, no self-compliance for portable batteries	Medium	2	DECLG can address issue as part of wider responsibilities	2
		Presence of historic stockpiles collected leading to increased quantities collected or to be collected,	PRO will not be able to fund a proportion or all of the collection and treatment	Limited or no quantities resulting in limited costs	Low	1	Has occurred previously in other waste streams	Medium	2	N/A	2
		Import of materials from Northern Ireland leading to increased quantities collected or to be collected not covered by producers funding,	PRO will not be able to fund a proportion or all of the collection and treatment	Limited or no quantities resulting in limited costs	Low	1	Has occurred previously in other waste streams	Medium	1	N/A	1
		Change in the value of recovered materials leading to increased treatment costs.	PRO will not be able to fund a proportion or all of the collection and treatment	Not really a factor for portable batteries	Low	1	Cyclical every 2-3 years	High	3	PRO to follow market trends and factors affecting the value of recyclables	3
		New collection and treatment targets which will increase waste collection and treatment costs.	PRO will not be able to fund a proportion or all of the collection and treatment	Future targets from EU will require to collect an additional 400 -500 tonnes of batteries	Medium	2	Certitude	High	3	DECLG and PRO to implement measures to meet collection targets.	6
		Poor procurement procedures or management of sub-contractors leading to increased cost	PRO will not be able to fund a proportion or all of the collection and treatment	Unlikely to exceed 1€ million	Low	1	Has occurred previously in other waste streams	Medium	2	DECLG requires minimum technical capacity from PRO. Experienced procurement team, Good procurement procedure	2
2	**Technical difficulties**	The waste contractor is bankrupt or must cease operation because of technical or legal reason	PRI waste will not be collected or treated	Unlikely to exceed 1€ million	Low	1	Has occurred previously in the waste management industry.	Medium	2	A number of waste operators could replace bankrupt contractor	2
		Leakage of waste from the current system	PRI waste not collected or treated by authorised channels and not contributing to target achievement	Risk could have serious impact due to EU targets, quantities and hazardous components	High	3	Evidence from waste composition survey	Certitude	3	DECLG and PRO to implement measures to meet collection targets.	9

Table E7: Farm Plastics PRI Risk Analysis

Risk ID	Description	Potential Failure Mode - What happens to make this risk eventuate?	Potential Failure Effects - What impact does it have on the Scheme?	Basis for Severity Rating - describe what could happen	Severity	EQUIVALENT	Basis for Occurrence Rating - for what reason is this rating chosen.	Occurence	EQUIVALENT	Current Controls - what is in place at the moment to stop this event occuring	Risk rating (occurence x severity)
1	**Financial difficulties**			**National targets which are met , waste is present in some quantity but is not hazardous,**							**3**
		Bad financial planning or setting the level of producers fees too low,	PRO will not be able to fund a proportion or all of the collection and treatment	National targets only, quantities 20,000 to 30,000 tonnes	Low	1	Has occurred previously (farm plastics), however PRO has significant reserve.	Medium	2	Financial plan required by the DECLG as part of the application, DECLG requires minimum technical capacity from PRO, financial health monitored by DECLG	2
		Funding not available because of a high level of non-compliance by obligated businesses	PRO will not be able to fund a proportion or all of the collection and treatment	National targets only, quantities 20,000 to 30,000 tonnes	Low	1	Has occurred previously in other waste streams. Limited non-compliance from large obligated businesses, no self-complier	Medium	2	DECLG can address issue as part of wider responsibilities	2
		Presence of historic stockpiles collected leading to increased quantities collected or to be collected,	PRO will not be able to fund a proportion or all of the collection and treatment	No large stockpiles, cost likely to be less than 1 €million	Low	1	Has occurred previously in other waste streams	Medium	2	N/A	2
		Import of materials from Northern Ireland leading to increased quantities collected or to be collected not covered by producers funding,	PRO will not be able to fund a proportion or all of the collection and treatment	Potential loss to PRO estimated to €150,000 and potential 1 €million to the Exchequer	Medium	2	Less than 10% of farm plastics put on market	Low	1	N/A	2
		Change in the value of recovered materials leading to increased treatment costs.	PRO will not be able to fund a proportion or all of the collection and treatment	Siginificant volatility in market, however currently only small contribution to value chain (<€50,000)	Low	1	Cyclical every 2-3 years	High	3	PRO to follow market trends and factors affecting the value of recyclables, improve quality and reduce contamination of materials collected	3
		New collection and treatment targets which will increase waste collection and treatment costs.	PRO will not be able to fund a proportion or all of the collection and treatment	National targets well met	Low	1	No upcoming EU targets	Low	1	N/A	1
		Poor procurement procedures or management of sub-contractors leading to increased cost	PRO will not be able to fund a proportion or all of the collection and treatment	Unlikely to exceed 1€ million	Low	1	Has occurred previously in other waste streams	Medium	2	DECLG requires minimum technical capacity from PRO. Experienced procurement team, Good procurement procedure	2
2	**Technical difficulties**	The waste contractor is bankrupt or must cease operation because of technical or legal reason	PRI waste will not be collected or treated	Unlikely to exceed 1€ million	Low	1	Has occurred previously in the waste management industry.	Medium	2	A number of waste operators could replace incumbent	2
		Leakage of waste from the current system	PRI waste not collected or treated by authorised channels and not contributing to target achievement	Unlikely to exceed 1€ million	Low	1	Good collection rate	Medium	2	DECLG and PRO to implement measures to meet collection targets.	2

Table E8: Tyres PRI Risk Analysis

Risk ID	Description	Potential Failure Mode - What happens to make this risk eventuate?	Potential Failure Effects - What impact does it have on the Scheme?	Basis for Severity Rating - describe what could happen	Severity	EQUIVALENT	Basis for Occurrence Rating - for what reason is this rating chosen.	Occurence	EQUIVALENT	Current Controls - what is in place at the moment to stop this event occuring	Risk rating (occurence x severity)
1	**Financial difficulties**			**No targets , waste is present in some quantity but is not hazardous, PRO has no responsibility for collection**							**2**
		Bad financial planning or setting the level of producers fees too low,	PRO will not be able to fund a proportion or all of the collection and treatment	National targets only, not involved in collection	Low	1	Has occurred previously (farm plastics)	Medium	2	Financial plan required by the DECLG as part of the application, DECLG requires minimum technical capacity from PRO, financial health monitored by DECLG	2
		Funding not available because of a high level of non-compliance by obligated businesses	PRO will not be able to fund a proportion or all of the collection and treatment	No targets, PRO not involved in collection	Low	1	Large number of obligated businesses, large estimated non-compliant obligated businesses, limited self-compliance, but low impact as costs is purely administrative	High	3	This risk will change if PRO is responsible for collection	N/A
		Presence of historic stockpiles collected leading to increased quantities collected or to be collected,	PRO will not be able to fund a proportion or all of the collection and treatment	No targets, PRO not involved in collection	Low	1	Significant quantities of historic stockpiles	High	3	This risk will change if PRO is responsible for collection	N/A
		Import of materials from Northern Ireland leading to increased quantities collected or to be collected not covered by producers funding,	PRO will not be able to fund a proportion or all of the collection and treatment	No impact on PRO as not involved in collection	Low	1	is occuring, difficult to quantify	Medium	2	This risk will change if PRO is responsible for collection	N/A
		Change in the value of recovered materials leading to increased treatment costs.	PRO will not be able to fund a proportion or all of the collection and treatment	No positive value to tyres	Low	1	Has occurred previously in other waste streams	Medium	2	This risk will change if PRO is responsible for collection	N/A
		New collection and treatment targets which will increase waste collection and treatment costs.	PRO will not be able to fund a proportion or all of the collection and treatment	No targets, PRO not involved in collection	Low	1	No upcoming EU targets	Low	1	This risk will change if PRO is responsible for collection	N/A
		Poor procurement procedures or management of sub-contractors leading to increased cost	PRO will not be able to fund a proportion or all of the collection and treatment	Limited procurement	Low	1	Has occurred previously in other waste streams	Medium	2	This risk will change if PRO is responsible for collection	N/A
2	**Technical difficulties**	The waste contractor is bankrupt or must cease operation because of technical or legal reason	PRI waste will not be collected or treated	No impact on PRO as not involved in collection	Low	1	Has occurred previously in the waste management industry.	Medium	2	This risk will change if PRO is responsible for collection	N/A
		Leakage of waste from the current system	PRI waste not collected or treated by authorised channels and not contributing to target achievement	No impact on PRO as not involved in collection	Low	1	Is occuring at a large scale	Certitude	3	This risk will change if PRO is responsible for collection	N/A

RISK TREATMENT

This is the process of modifying the risk, but in this case it is used to decide on the level of contingency funding to be provided. Other measures could also be used to reduce the risk and reduce the level for contingency funding.

In order to assign contingency fund amounts, we have assumed that:

- Risks in red would require the compliance scheme to provide 1 years funds as contingency fund.
- Risks in yellow would require the compliance scheme to provide 6 months funds as contingency fund.
- Risks in green would require the compliance scheme to provide 3 months funds as contingency fund.

Based on this approach the following PRI areas would require 1 full years funds for a contingency fund: Packaging, WEEE, batteries

The farm plastics PRI and the tyres PRI would require a notional six months and three months funds to be in place respectively. However, should the tyres PRI be involved in the collection of waste tyres as recommended in Section 9 of this report, a notional six months funds for a contingency fund should be required.

It must be remembered, this approach may change due to changes in the risk register and the knock on effect of such.

Packaging

Risk ID (from 'Risk Register' sheet)	Description (from 'Risk Register' sheet)	Potential Failure Mode - What happens to make this risk eventuate?	Potential Failure Effects - What impact does it have on the Scheme?	Basis for Severity Rating - describe what could happen	Severity	EQUIVALENT	Basis for Occurrence Rating - for what reason is this rating chosen.	Occurence	EQUIVALENT	Current Controls - what is in place at the moment to stop this event occuring	Risk rating (occurence x severity)
1	**Financial difficulties**			**EU Targets which are met, waste is present in large quantity but is mostly not hazardous,**							4
		Bad financial planning or setting the level of producers fees too low,	PRO will not be able to fund a proportion or all of the collection and treatment	Repak is an experienced PRO, with experienced personnel	Low	1	Has occurred previously (farm plastics)	Medium	2	Financial plan required by the DoECLG as part of the application, DoECLG requires minimum technical capacity from PRO, financial health monitored by DoECLG	2
		Funding not available because of a high level of non-compliance by obligated businesses	PRO will not be able to fund a proportion or all of the collection and treatment	Some non-compliant obligated businesses, possibility for self-compliance	Medium	2	Has occurred previously in other waste streams	Medium	2	DoECLG can address issue as part of wider responsibilities	4
		• Presence of historic stockpiles collected leading to increased quantities collected or to be collected,	PRO will not be able to fund a proportion or all of the collection and treatment	No stockpile	Low	1	No stockpile	Low	1	N/A	1
		• Import of materials from Northern Ireland leading to increased quantities collected or to be collected not covered by producers funding,	PRO will not be able to fund a proportion or all of the collection and treatment	No import from NI	Low	1	Packaging waste travels, however will need further economic incentives and absence of checks by PRO	Medium	2	N/A	2
		• Change in the value of recovered materials leading to increased treatment costs.	PRO will not be able to fund a proportion or all of the collection and treatment	Siginificant volatility in market, potential decrease to no value, however subsidy system, landfill tax mitigate against this	Low	1	Cyclical every 2-3 years	High	3	PRO to follow market trends and factors affecting the value of recyclables	3
		• New collection and treatment targets which require targeting more difficult waste for collection and treatment.	PRO will not be able to fund a proportion or all of the collection and treatment	Potential future targets from EU, but there will time to adapt	Low	1	Very likely that the EU Packaging Directive will be reviewed	High	3	DoECLG and PRO use European links to identify new developments early.	3
		• Poor procurement procedures or management of sub-contractors leading to increased cost	PRO will not be able to fund a proportion or all of the collection and treatment	Not a major risk as the system is based on subsidies. If one operator fails, another will take over	Low	1	Limited management of contractors due to subsidy system	Low	1	DoECLG requires minimum technical capacity from PRO	1
2	**Technical difficulties**	The waste contractor is bankrupt or must cease operation because of technical or legal reason	PRI waste will not be collected or treated	Not a major risk the system is based on subsidies. If one operator fails, another will take over	Medium	2	Has occurred previously in the waste management industry.	Medium	2	DoECLG requires minimum technical capacity from PRO	4

WEEE

Risk ID (from 'Risk Register ' sheet)	Description (from 'Risk Register' sheet)	Potential Failure Mode - What happens to make this risk eventuate?	Potential Failure Effects - What impact does it have on the Scheme?	Basis for Severity Rating - describe what could happen	Severity	EQUIVALENT	Basis for Occurrence Rating - for what reason is this rating chosen.	Occurence	EQUIVALENT	Current Controls - what is in place at the moment to stop this event occuring	Risk rating (occurence x severity)
1	**Financial difficulties**			**EU Targets which are met however new targets will be challenging, waste is present in small quantity but is mostly not hazardous,**							6
		Bad financial planning or setting the level of producers fees too low,	PRO will not be able to fund a proportion or all of the collection and treatment	PROs with experienced personnel	Low	1	Has occurred previously (farm plastics)	Medium	2	Financial plan required by the DoECLG as part of the application, DoECLG requires minimum technical capacity from PRO, financial health monitored by DoECLG	2
		Funding not available because of a high level of non-compliance by obligated businesses	PRO will not be able to fund a proportion or all of the collection and treatment	Some non-compliant obligated businesses, no self-compliance allowed	Low	1	Has occurred previously in other waste streams	Medium	2	DoECLG can address issue as part of wider responsibilities	2
		• Presence of historic stockpiles collected leading to increased quantities collected or to be collected,	PRO will not be able to fund a proportion or all of the collection and treatment	No stockpile, but possible technological changes leading to product replacement	Medium	2	No stockpile	Medium	2	N/A	4
		• Import of materials from Northern Ireland leading to increased quantities collected or to be collected not covered by producers funding,	PRO will not be able to fund a proportion or all of the collection and treatment	No import from NI	Low	1	Limited import of WEEE	Low	1	N/A	1
		• Change in the value of recovered materials leading to increased treatment costs.	PRO will not be able to fund a proportion or all of the collection and treatment	Siginificant volatility in market, little mitigation,	Medium	2	Cyclical every 2-3 years	High	3	PRO to follow market trends and factors affecting the value of recyclables	6
		• New collection and treatment targets which require targeting more difficult waste for collection and treatment.	PRO will not be able to fund a proportion or all of the collection and treatment	Future targets from EU, but there will time to adapt	Medium	2	Certitude	High	3	DoECLG and PRO use European links to identify new developments early.	6
		• Poor procurement procedures or management of sub-contractors leading to increased cost	PRO will not be able to fund a proportion or all of the collection and treatment	Possible risks, small number of specialised contractors	Medium	2	Good procurement procedure	Low	1	DoECLG requires minimum technical capacity from PRO	2
2	**Technical difficulties**	The waste contractor is bankrupt or must cease operation because of technical or legal reason	PRI waste will not be collected or treated	Possible risks, small number of specialised contractors	Medium	2	Has occurred previously in the waste management industry.	Medium	2	DoECLG requires minimum technical capacity from PRO	4

APPENDIX F: CORPORATE GOVERNANCE REPORT

30 MAY 2013

CORPORATE GOVERNANCE REPORT

Annex to the RPS
Review of the Producer Responsibility Initiative Model in Ireland

PHILIP LEE
SOLICITORS
DUBLIN · BRUSSELS

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1. Context to the Corporate Governance Report

This Report considers the legal relationship between the Schemes and the DECLG. It discusses the current framework of this relationship (including the contractual documentation in place between the DECLG and the Schemes) and outlines our recommendations for changes to this framework in order to develop the relationship between the two parties and to streamline it whilst optimising the desired environmental outcomes.

These recommendations call for the implementation of a coherent set of rules to (1) govern the legal relationship between the Schemes and the DECLG, (by way of a Service Level Agreement) and (2) implement rules according to which the Schemes should be governed internally (by way of one Corporate Governance Code which all Schemes would be obliged to sign up to pursuant to the provisions of their respective Service Level Agreement).

1.1 Overview of the Legislative Framework

The development of Irish producer responsibility initiatives (PRIs) has been influenced to a large degree by EU waste policy and legislation. EU waste policy has evolved over the last four decades through a series of environmental action plans, policy initiatives and legislation that aims to protect the environment and human health from the adverse impacts of waste generation and management. To this end EU waste policy, as embodied in the waste hierarchy, prioritises waste prevention followed by preparing for re-use, recycling and other forms of recovery, with disposal such as landfill as the option of last resort.

Current EU waste policy adopts a life-cycle approach to waste and the waste hierarchy is associated with the broader objective of reducing the environmental impacts arising from the consumption of natural resources.

The Waste Framework Directive (2008/98/EC), the corner stone of EU waste law, requires Member States to take appropriate measures to encourage firstly the prevention or reduction of waste production and secondly the recovery of waste by means of recycling, preparing for re-use, reclamation or any other process.

Article 8 of the Waste Framework Directive provides for Extended Producer Responsibility (EPR). Member States may adopt measures for producers to take responsibility for the acceptance of returned products, financing and making arrangements for the subsequent management of waste and making information in relation to such measures publicly available.

Article 11 of the Waste Framework Directive obliges Member States to take appropriate measures to promote the re-use of products by encouraging the establishment and support of re-use and repair networks, the use of economic instruments, procurement criteria, quantitative objectives or other measures. Producer responsibility is among the economic instruments employed by EU waste legislation with the ultimate aim of the EU becoming a recycling society, which seeks to avoid waste and uses waste as a resource.

Extended Producer Responsibility legislation has developed in line with the advancement of EU waste legislation and policy from initial waste stream recycling targets to an integrated life cycle approach to waste management. The concept of Extended Producer Responsibility is closely linked with the polluter pays principle and can be considered as an application of the principle to waste producers, in so far as the costs of waste management are borne by the producer of the waste. This in turn promotes eco-design of products, as producers are incentivised to redesign products to reduce waste management costs. As set out in Recital 27 of the Waste Framework Directive, Extended Producer Responsibility is: "*one of the means to support the design and production of goods which take into full account and facilitate the efficient use of resources during their whole life-cycle including their repair, re-use, disassembly and recycling without compromising the free circulation of goods on the internal market.*"

The overarching Extended Producer Responsibility requirements in the Waste Framework Directive are supplemented by other Directives for specific waste streams namely, packaging and packaging waste, batteries, end-of-life vehicles and waste electrical and electronic equipment. Each of these Directives sets out the legal framework for the operation of producer responsibility schemes for the waste stream in question, including targets/objectives to be achieved, control and reporting mechanisms. They emphasise the need for all producers of waste materials to accept responsibility for such waste and operate within a spirit of shared responsibility and close co-operation to achieve the objectives of the Directives.

The Waste Framework Directive provides that Member States may take legislative and non-legislative measures to ensure that product producers (which include those who manufacture, process, treat, sell or import products) have extended producer responsibility. This would include the development of national PRIs. However when applying producer responsibility Member States are obliged, pursuant to Article 8(3) of the Waste Framework Directive, to take into account the:

"technical feasibility and economic viability and the overall environmental, human health and social impacts, respecting the need to ensure the proper functioning of the internal market."

Furthermore, according to the Waste Framework Directive, extended producer responsibility must be applied without prejudice to waste stream specific legislation and product specific legislation.

The Waste Management Act 1996 and the Waste Management (Waste Directive) Regulations 2011 set out the legislative basis for EPRs under Irish law. There are presently Extended Producer Responsibility / Producer Responsibility Initiative (PRI) arrangements in six waste streams, waste electrical and electronic equipment (WEEE); batteries; packaging; farm plastics; end of life vehicles (ELV); and tyres. In all of these waste streams, except ELV, producers have the choice of meeting the required PRI environmental outcomes specified in the applicable legislation either through membership of a PRI Scheme which acts collectively on behalf of the producer-members, or self-complying on an individual basis.

1.2 Understanding of the Requirements of the Corporate Governance Framework

In drafting this Report we have sought to identify the key needs of the Corporate Governance Framework as set out in the DECLG terms of reference. Having considered these in some detail we believe that they can be summarised as follows:

- Meeting requirements of domestic and EU waste law and policy including the achievement of targets;
- Retaining a sufficient control and influence over the Schemes' activities without imposing an additional administrative burden on the DECLG ;

- Mandating that all Schemes adopt one common set of rules for Corporate Governance, which reflect current highest standards;
- Ensuring that the Schemes which contract with the DECLG offer a consistent and high quality service;
- Ensuring that reliable data can be collected and processed in respect of each Scheme;
- Enhancing the ability of DECLG to address/sanction poor or non-performance by any Scheme;
- Ensuring the availability of a Contingency Fund for continued delivery of each PRI in the event of failure of a Scheme;
- Increasing the opportunities for and actual transparency for members around all aspects of the Schemes' operations; and,
- Increasing the transparency around environmental outputs and conditions of approvals for the Schemes in line with the Aarhus Convention;

Overall we understand that the DECLG requires a simple, efficient, transparent and easily enforceable legal structure to govern its relationship with the Schemes to ensure the highest standards of internal Corporate Governance. Whilst we have endeavoured to frame our recommendations in a manner which will be efficient and low maintenance for the DECLG, we do wish to highlight that a successful relationship between the DECLG and the Schemes going forward will require on-going monitoring, management and engagement on the part of the DECLG with the Schemes. We would encourage this engagement as a means of minimising the risk of issues arising with the Schemes under the new structures we are recommending.

2. Current Governance Framework for Producer Responsibility: The Schemes

2.1 Introduction

Currently the contractual framework between the Schemes and the DECLG is based on an application process which, if successful, is followed by the grant of an approval to a given Scheme. The approval is set out in a letter from the Minister and is subject to a "schedule of conditions". These are not countersigned by the Scheme but take the form of an appendix to the Letter. The applicable conditions differ across the various Schemes and we set out below a sample of these approvals in order to demonstrate these differences.

2.2 Analysis of the Current Arrangements

We have been furnished with copies of the approval letters and schedules of conditions (collectively the Current Arrangements) in respect of the Schemes which are currently authorised by the DECLG. We have also been furnished with a summary document outlining the views of stakeholders in relation to the Corporate Governance Framework (attached at Annex 2 to this Report). These documents demonstrate that the DECLG has attempted to address both contractual obligations for the Schemes (by reference to the relevant statutory framework) and internal governance type obligations (by setting out obligations on audit, composition of the board etc.) in the same contractual document. However, the Current Arrangements, which date between December 2007 and November 2011 are each individual and as such address different matters. They are not consistent with each other. We briefly demonstrate this point below by referring to a sample of the Current Arrangements.

2.2.1 Sample of the Current Arrangements Reviewed

One approval letter schedule of conditions (which dates from 2007) outlines the data and reporting requirements, some limited stipulations in relation to the board of directors, provision for audits, and provisions on dissemination of information.

A further approval letter which we analysed, from 2010, has a slightly longer set of conditions appended to it, addressing membership, opening hours, provisions to be included in its annual environmental report, management of financial resources, cooperation with other compliance schemes, information dissemination and retailer registration.

Another approval made in September 2008 also comprises of an approval Letter (stating that the approval covers a period up to 30 September 2013) and a schedule of conditions. This schedule of conditions has a different focus to those considered immediately above in that it focuses on the internal governance of the company, mandates the furnishing of environmental and financial statements and contains mandatory statements regarding the making of amendments to the company's Memorandum and Articles of Association and the composition of the Board of Management. The contingency reserve, cooperation with other Schemes, targets, and information dissemination are also addressed.

Among the most recent Current Arrangements we have reviewed is an approval from October 2011. Its schedule of conditions addresses certain general provisions, reporting requirements, management of financial resources, cooperation with other Schemes, and achievement of targets.

2.3 Conclusions from Review of the Current Arrangements

It is our view that the Current Arrangements have two principal weaknesses. Firstly they each contain differing contractual provisions, meaning that there are few consistent obligations which would apply to all the Schemes. This is a considerable weakness as some of the Current Arrangements do not touch on clauses which we would view as key. Secondly the current documentation lacks certain basic contractual provisions which are required to protect the DECLG.

For example, some schedules do not provide for the possibility for the DECLG to terminate them or state what would occur in the case of unsatisfactory performance or upon an insolvency event occurring in respect of a Scheme. We are aware that some of these powers may be contained in the underlying legislation but would state that it is advisable to see express powers provided for in the contractual documentation between the DECLG and the Scheme. In other approval letter schedules the main focus appears to be on Corporate Governance and many standard contractual provisions, such as, termination, dispute resolution mechanisms, confidentiality, force majeure, and governing law are missing.

The DECLG has a broad statutory power to grant or refuse an application for approval as a Scheme under the WEE, Batteries, Packaging and Waste Tyres legislation.[1] While the DECLG would appear to have a discretion to refuse an application following a careful consideration of that application, any such discretionary power must be exercised legitimately in accordance with the purposes and objectives of the legislation.

We would recommend that a very straightforward new system is implemented to ensure that the DECLG receives appropriate contractual protections from the Schemes and that the Corporate Governance Framework which reflects best practice is adopted by the Schemes. This recommendation can be achieved through a two-step approach:

Firstly we recommend that each Scheme enters into a Service Level Agreement (SLA) with the DECLG. The SLA will form the contract between the two parties and will replace the current system of approval letters combined with schedules. Each SLA can be tailored to each Scheme to ensure that the specifics of each approval are catered to, but at a minimum each SLA will contain consistent basic contractual provisions which will give the DECLG a greater level of certainty and protection. The basic contract law clauses will be the same in each Scheme's SLA and the 'bespoke' provisions to apply to different Schemes will be added into the SLA after the standard clauses. One of the objectives of this SLA system will be to

[1] SI No. 355 of 2011 (European Communities Waste Electrical and Electronic Equipment) Reg 33(1), SI No. 268 of 2008 (Waste Management Batteries and Accumulators) Reg 36(1), SI No. 798 of 2007 (Waste Management Packaging) Reg 19(1), SI No. 664 of 2007 (Waste Management Tyres and Waste Tyres) Reg 27(1). The legislation relating to Farm Plastics and ELVs is not robust, and there is no PRO for ELVs.

implement a system where the DECLG can manage the performance of the Scheme on a low resource basis. Although our aim is to ensure that the DECLG does not have to deploy very significant resources on an on-going basis to the Schemes, we would reiterate that a successful relationship between the DECLG and the Schemes (from the DECLG's perspective) will require on-going management and a monitoring role for the DECLG (or its agent).

In tandem with the implementation of individual SLAs for each Scheme, we recommend that one standard Code of Corporate Governance is drafted which will be adopted by each Scheme and which will apply across all the Schemes. It will be a term of each SLA that the Schemes are contractually required to comply with the Code of Corporate Governance, and a breach of the Corporate Governance Code will constitute a breach of the SLA. This document will enable the DECLG to impose high standards of Corporate Governance within each Scheme and will address many of the points which the DECLG had previously sought to address by way of the conditions to the approval letters. Schemes would be contractually bound (via their SLA) to implement the Code of Corporate Governance and the DECLG would reserve the right to amend the Code from time to time meaning that the Code of Corporate Governance could be updated to reflect changes to best practice without requiring the underlying contract to be renegotiated or re-executed.

3. Regulating the Relationship between the Schemes and the Department: The Service Level Agreements

As set out in Section 2.3 above, we recommend that the DECLG enters into an SLA with each Scheme. As these SLAs would replace the Current Arrangements in place between DECLG and the Schemes, consideration will have to be given to whether the DECLG is permitted to terminate the Current Arrangements on notice to the Schemes or whether it prefers to await their expiry before implementing the new system of SLAs.

There is an express statutory power to review, revoke, vary and replace approvals in all the relevant statutory instruments except those relating to Farm Plastics and End of Life Vehicles.[2] This power is subject to prescribed procedural requirements including the provision of notice of proposed changes and a period of no less than four weeks for the Scheme to make submissions and/ or apply for a new approval, as required.

Once the relevant notice requirements have been adhered to any necessary terminations have been effected, we recommend that each Scheme signs up to an individual SLA so that requirements specific to each Scheme can be accommodated. In addition to the 'bespoke' section of the Schemes' SLAs (which we would anticipate would be quite succinct) we recommend below a series of provisions which would be contained in each SLA. These provisions will enable the DECLG to gain key contractual protections which will assist it in managing the performance of the Schemes at arm's length and without requiring significant time/resources. The SLAs, once executed by the Schemes, have the advantage that responsibility for compliance with the obligations imposed on the Schemes rests with the Schemes. As such they are efficient from the DECLG's point of view because there is a low burden of administration but the obligations are quickly and easily enforceable. The DECLG will of course need to maintain a monitoring role in order to know if/when a breach of the SLA may occur or has occurred so that it can take appropriate measures.

3.1 Key Clauses

We set out below our recommendations with regard to the content of each SLA. As you will note these focus on implementing key protections for the DECLG and are divided into four categories as follows:

3.1.1 Obligations on the Schemes

The provisions of each SLA should clearly set out the following obligations on the Schemes:

Incorporation of the Corporate Governance Code

The SLA should provide that the provisions of the Code of Corporate Governance (as further discussed below) are accepted and shall immediately be adopted by the Scheme and that the Scheme recognises that the Code as executed by the Scheme is subject to modification

[2] SI No. 355 of 2011 (European Communities Waste Electrical and Electronic Equipment) Reg 34, SI No. 268 of 2008 (Waste Management Batteries and Accumulators) Reg 37, SI No. 798 of 2007 (Waste Management Packaging) Reg 20, SI No. 664 of 2007 (Waste Management Tyres and Waste Tyres) Reg 28

by the DECLG at its sole discretion from time to time and undertakes (1) to make any immediate amendments necessary to its Memorandum and Articles of Association; (2) to make such further amendments to its Memorandum and Articles of Association as may be necessary in the future if the Code is modified or updated by the DECLG; and (3) to submit the further amendments to its Memorandum and Articles of Association to the DECLG for its prior approval.

Requirements of approval by the DECLG as a Scheme

This clause in the SLA should operate as a system of pre-conditions so that the Scheme is only approved on condition that it abides by these requirements. These will include clauses imposing reporting requirements on the Schemes and regarding the collection of data necessary for the Environmental Protection Agency to report to the domestic and EU authorities on the meeting of targets. They will also provide for rights of verification and audit and can include a provision requiring the Scheme to commit that it has the capacity and technical expertise required to meet the targets set out later in the SLA. The provisions on the collection and reporting of data should be specific to each Scheme and should be detailed and expressed to be mandatory in nature.

Achievement of Targets

As the achievement of targets is of critical importance to the DECLG, it should clearly enumerate the individual Targets each Scheme is required to meet for its individual waste stream. We recommend that the DECLG structures the overall target by dividing it into a series of interim targets to be met by each Scheme. We recommend the interim and overall targets are set out in a schedule to the SLA. We further recommend that it is expressly stated in the SLA that a breach of the clause on achievement of targets (including interim as well as final targets) constitutes a contractual breach of the SLA. The Scheme reporting obligations should be designed so as to provide an early warning or 'red flag' system to highlight when a Scheme is off-target (and thereby in breach of its SLA with the DECLG). The advantage of this approach is that the DECLG gains early insight into the progress of the Scheme in terms of meeting its targets on an annual or more frequent basis.

We recommend that the steps necessary to remedy such a breach of contract (including non-financial and financial measures and penalties) should be set out in a schedule to the SLA. Such measures and penalties should be specifically devised to address the cause of the breach, including any issues leading to the failure to achieve the requisite targets. They might include, for example, increased spending on education and awareness, increased rates of collection, training for key personnel and directors, and assignment of additional resources. These measures may be specified by the DECLG following consultation with the Scheme, or proposed directly by the Scheme, as part of the Scheme approval process.

In addition to the adoption of appropriate levels of management and oversight by the DECLG, we also recommend the use of non-financial and financial contractual measures and penalties for the achievement of targets. Other options are discussed under the heading 'Encouraging PRO Performance' in Section 4.4 of the main report. In particular, it is clear that the DECLG currently has no statutory power to impose fines for breach of targets, and

that provision for such a measure would need to be introduced in primary legislation in order to have any legal effect. The practicality of enforcing statutory fines would need to be considered, given the likely uncertainty with regard to the cause of any failure to achieve targets.

As discussed below at section 3.1.4, the SLA should incorporate an alternative dispute resolution (ADR) mechanism to address any legal and commercial disputes arising under the SLA. We recommend that the ADR clause is referred to in the clause on achievement of targets. In this way, if a dispute arises with regard to the non-financial and financial measures and penalties to be adopted, the matter might quickly be referred to an expert/ arbitrator appointed to assist the DECLG and the Scheme to resolve the issue quickly and efficiently, ensuring that the Scheme is required to take such steps as are necessary and appropriate to remedy the breach of contract in the event that an interim target is missed.

Contingency fund

The purpose of the Contingency Fund (Fund) is to ensure the availability to the DECLG of sufficient resources for the continued delivery of each PRI in the event of failure of a Scheme. The SLA should include a clause outlining this rationale for the retaining of a Fund.

We understand that there is currently a risk that a Scheme may access the Fund to fund day to day operations. In order to avoid the Fund being depleted in this way, the SLA should require the Fund to be ring-fenced from the day-to-day financial requirements of the Scheme, and the Fund should be held either by the DECLG (subject to conditions), or by the Scheme in trust for the DECLG.

The SLA should carefully outline the circumstances in which DECLG is permitted by the SLA to access the Fund, where it might have "step–in rights" and when (if at all) the Scheme or its members would be permitted to access it. We are aware that a key requirement for the DECLG is that the Fund must be available in the event of a Scheme collapsing in order that continuity of service can be guaranteed. We therefore recommend that the DECLG retains full control over and is proprietor of the Fund, subject to the provisions of the SLA.

However, in the event that it is not feasible or practical to have the Fund directly under the control of the DECLG, an alternative recommendation would be that title to the Fund remains with the Scheme but that specific contractual provisions are inserted into this clause of the SLA specifying an exhaustive list of circumstances in which a Scheme would be permitted to access the Fund or providing for the Fund to be held in a separate bank account and providing that it would constitute a breach of the SLA for a Scheme to withdraw monies from the Fund in circumstances other than those listed.

The question also arises as to whether the producer members of the Scheme who contribute to the Fund should be able to recoup the monies contributed to the Fund if they decide to transfer to another Scheme (where applicable) or exit the Scheme in favour of self-compliance. Clearly, the SLA conditions should not have the effect of restricting freedom to switch between Schemes (where applicable) and it is possible to address these

issues under both of the proposals above (i.e. Fund becoming the property of DECLG or Fund remaining in the ownership of the Scheme held in trust for the DECLG). In both circumstances the question of a producer's contribution following that producer if it switches Scheme can be addressed by mandating specific accounting requirements so that it is at all times clear who has contributed monies to a given Fund, and the relevant amounts. The primary objective of the DECLG must be to ensure that the Fund, or Funds, are sufficient to meet the potential costs of continuing the PRI in the event of a failure of the Scheme.

The SLA (or if the DECLG prefers a specific side agreement drafted solely for regulating the Fund) can enumerate the circumstances in which the contributions of a producer will be transferred to the Scheme the producer has switched to. It is recommended that the DECLG should restrict to a proportionate extend (either in quantum or in time) the ability of producers to fully recoup financial contributions to the Fund in circumstances where a producer is exiting a Scheme in order to self-comply. The rationale for this is to avoid a floodgate scenario where many producers exiting simultaneously may result in an unsustainable depletion of the Fund. It may be possible to structure the SLA provisions such that a producer in these circumstances may be able to recover a proportion of its contribution, subject to the condition that the recoupment of monies contributed to a Fund should not have a detrimental effect on the overall capacity of the Fund to continue the service in question in the event of a Scheme collapse. The DECLG should be satisfied that there is a sufficient factor of safety such that the details it decides upon will not call into question the capacity of the Fund in the event of collapse of a Scheme.

In terms of the length of time it would take for a Fund to amass we note that at present certain Schemes have no specified length of time whilst others have a period of five years. We recommend that a Fund is established immediately or as soon as possible upon the creation of any new Scheme.

Historic WEEE

The fund for Historic WEEE differs from the Contingency Fund as the Historic WEEE fund's function is to discharge the historic WEEE liability. It is paid by consumers and has been allocated to the Schemes. In light of the fact that we understand that the Historic WEEE fund is being depleted we recommend that the WEEE Schemes should be required, by virtue of a clause in their SLA to provide evidence of the quantities of historic WEEE collected and treated in order to access this fund.

Cooperation with other Schemes / self-compliers

Depending on the Scheme, the DECLG should specify provisions and obligations in respect of cooperation with another Scheme operating in the same waste stream (if there is more than one Scheme in the stream) and with producers who have chosen to self-comply. We would recommend that the DECLG also mandates that Schemes in different waste streams should cooperate where this would be of benefit (for example in the co-funding of a public awareness programme which could apply to a number of streams). In this regard it should be specified that cooperation between Schemes should at all times occur within the

parameters of applicable competition law and in compliance with competition law and all other applicable regulations.

Notice

One of the key requirements for DECLG is that of certainty in relation to the provision of services by the Schemes. We therefore recommend that a significant period of notice be required of the Scheme before it would cease to provide the Services, and that such period might be linked to the expiration of the members' annual membership fees. The relevant notice period would be provided for in the SLA under the termination provisions (further outlined at 3.1.3 below). It is up to the DECLG to decide what period it would view as sufficient but it would be very helpful if this were expressed in the SLA as this would enable the DECLG to take measures against a Scheme which threatened or indicated that they no longer wished to provide services without providing sufficient notice.

3.1.2 Services to be Provided by the Schemes

Depending on the complexities of the given waste stream this clause may vary from SLA to SLA. At its core the clause should set out in a significant amount of detail the exact scope of services (which can be defined as the "Services") which the DECLG requires the Scheme to carry out. We understand that these will include (but are not necessarily limited to) membership services, collection services, sales services, marketing services and support services. The clause should be extensive and exhaustive and should include each individual service and role which DECLG requires the given Scheme to carry out. The rationale behind an extensive enumeration of the Services is that the DECLG can, if necessary, easily refer the Scheme to the service in question in the event that there is unsatisfactory service delivery and raise this as a potential breach of the SLA.

3.1.3 Ability of the DECLG to Terminate the SLA

We recommend that the DECLG should have the ability to cease or terminate its SLA with a given Scheme in the event that the Scheme breaches a key provision of the SLA or ceases carrying out the Services. The lack of an express provision in this regard under the Current Arrangements is a cause for concern and could certainly be easily remedied by adopting our recommendation to include a clause outlining events which would result in the DECLG being able to terminate the SLA. We recommend that the following events should trigger an ability for DECLG to terminate the SLA:

- if an order is made or an effective resolution is passed or a petition is presented for the dissolution (in the case of a partnership) or winding up (in the case of a company) of the Scheme;
- if a receiver, examiner, administrator or liquidator is appointed over any of the property or assets of the Scheme;
- if the Scheme commits any breach of the SLA (including but not limited to defaults in provision of the Services) which, if capable of remedy, shall not have been remedied within thirty days after written notification thereof has been served on the Scheme;
- if a distress or execution order is levied or served upon any of the property or assets of the Scheme and is not paid off within thirty days;
- if the Scheme shall cease or threaten to cease to carry on all or a substantial part of the Services;
- if the Scheme is in breach of any of the provisions of the SLA (including but not limited to the Warranties set out in the SLA);
- if the Scheme is in breach of any provision of the Companies Acts or other applicable legislative provisions; and
- if any other event occurs which the DECLG in its absolute discretion considers might or does adversely affect the ability of the Scheme to carry out the Services or carry out and and/or to comply with its obligations hereunder.

The DECLG also needs to give careful consideration to whether the threatening of cessation of the SLA will be a sufficient motivator for the Schemes to remedy any issues which the DECLG may raise with them. The termination clause in the SLA can be set out so as to provide that certain of the scenarios above (such as the winding up events) will trigger an

automatic termination of the SLA. This means that the SLA would come to an end automatically upon the occurrence of one of these events. For other scenarios above the DECLG may elect to give the Scheme a period of time (30 business days) to remedy or rectify the occurrence to the satisfaction of the DECLG. If the occurrence has not been rectified by the Scheme within the period of time set out in the SLA the DECLG would then be able to serve a notice on the Scheme terminating the SLA. If the threatening of cessation of the SLA may not be a sufficient motivator for the Schemes to remedy any issues which the DECLG may raise with them, the DECLG may also wish to consider other contractual measures and penalties (financial or non-financial), in addition to termination of the SLA.

In addition, the termination provisions of the SLA should also address the ability of the Scheme to terminate the SLA. As stated above this should provide for a significant notice period before termination in order to enable the DECLG to make the necessary alternative arrangements before a Scheme exited a particular market.

3.1.4 Other Standard Contractual Protections

In addition to the key provisions above we recommend that the DECLG ensures that the following clauses are also inserted into each SLA:

Term

Each SLA should have a start date and an express fixed duration. It should also specify the date by which the Scheme must apply for renewal or compete for the approval. Failure to meet the deadline for renewal may result in the approval lapsing. These provisions will enable the Agreement to terminate by effluxion of time and also provides the framework for the remainder of the obligations of the Agreement. It has been suggested that the duration of the SLA be linked to the deadlines for the meeting of environmental Targets and that failure to meet targets could result in non-renewal of the SLA.[3]

Disputes

The DECLG is effectively the regulator of the Schemes, and its decisions pursuant to the relevant Statutory Instrument will be binding, subject to the limited right of the Scheme to challenge decisions by way of Judicial Review proceedings in the High Court.

Other issues may arise between the DECLG and the Scheme which amount to a legal or commercial dispute under the SLA. In the ordinary course, legal and commercial disputes under a contract will be resolved by the Courts. However, this can be a costly, lengthy and adversarial process. We therefore recommend that the DECLG inserts a clause into the SLA which would invite both parties to submit disputes under the SLA to an expert agreed by them both, or to mediation or arbitration before having recourse to the courts. This option (in particular opting for a binding determination of an expert) has the advantage of speed and maintaining relationships, and is usually more cost effective than going to Court. Mediation is also a good option but the parties must both agree to the outcome, (failing

[3] In the Competition report section entitled " A single v Multiple PROs: Holding the PRO to account"

which the parties normally submit the dispute to binding arbitration). This option would not need to be immediately invoked and could be stated to apply only if informal correspondence/ interaction between the scheme and the Department (within fixed time parameters) has failed to achieve agreement.

Warranties in favour of the DECLG

The DECLG should also consider introducing a series of warranties for the individual Scheme. Warranties are contractual undertakings or promises which, if not respected, trigger an action by the party in whose favour they are drafted, for breach of warranty. These typically include warrants that:

- The Scheme is in compliance with all applicable laws, and regulations including but limited to waste management, planning and environmental legislation;
- The Scheme is in compliance with the Code of Corporate Governance which it signed up to on [insert date] and which may be amended by the DECLG from time to time;
- The Scheme has obtained and maintains all necessary consents, approvals, authorisations, licences and permissions which are required to enable it to comply with its obligations under the SLA and to enable it to procure completion of the Services and shall not commit any act or omission which might invalidate, breach or otherwise impair the effect of such consents, approvals, authorisations, licences or permissions;
- The Scheme is in full compliance with all necessary filings with all applicable registries including but not limited to the Companies Registration Office and the Revenue Commissioners;
- The Scheme maintains all insurances necessary to ensure compliance with the SLA;
- All information, reports and documents provided by the Scheme, its employees or agents pursuant to the provisions of the SLA and during the application process are and shall be at all times true and accurate; and,
- The Scheme has full power and authority to enter into and perform the SLA which constitutes or when executed will constitute binding obligations on the Scheme in accordance with its terms.

Other General (boilerplate) Clauses

In addition we recommend that the SLA contains an obligation on the Scheme to effect all insurances necessary for the carrying out of its business. The SLA should also expressly restrict novation or assignment to the prior written consent of the DECLG. It should provide that the Minister and the DECLG are indemnified from and against all actions, proceedings and costs, claims, demands and liabilities, arising directly or indirectly, from any act or omission of the Scheme, its employees, servants or agents in connection with the SLA or any breach of the SLA. It should provide that the SLA is governed by the laws of Ireland, and include a Force Majeure clause and a confidentiality clause.

Please see further the sample table of contents for an SLA contained at Annex 1 to this Report.

4. Regulating Governance within the Schemes: The Corporate Governance Code

Introduction

Corporate Governance refers to the system by which companies are directed and controlled. The board of directors are responsible for the governance within a company. Corporate Governance concerns what the directors do and how they set the values of a company. A Code of Corporate Governance regulates the key components of the practice and procedure of the company and its board of directors. The key underlying principles should be probity, accountability and transparency. A Code of Governance must also be capable of adaptation and revision to take account of changing economic and commercial environments.

We are acutely aware that in seeking a Corporate Governance Code that can be adopted by the Schemes, the DECLG's needs centre on practicality, reliability and control. With these in mind we set out our recommendations on the adoption of a Code of Corporate Governance which each Scheme would be contractually obliged to adopt (pursuant to the provisions of their SLA) in order to be authorised by the DECLG.

4.1 Desk Review into other Codes of Governance

There are a number of well-developed Codes of Governance which have been considered for the purposes of this review. The most relevant Codes are discussed below.

UK Code of Governance (2010)

The UK Corporate Governance Code was first developed in 1992 and has subsequently been revised, with the most recent issue in June 2010 by the Financial Reporting Council. It is primarily intended for companies and financial institutions operating in the financial and commercial sector, but it has been applied by a number of corporate entities and organisations both in the UK and further afield. It is considered to be an example of best practice in the area of Corporate Governance in its field.

Although this code has proven helpful in our research we do not consider that it should be adopted wholesale by DECLG as we would rather recommend a bespoke code specifically designed for producer responsibility in Ireland and the particular requirements of the DECLG in terms of governance of the Schemes.

Code of Practice for the Governance of State Bodies (2009)

The Irish Code of Practice for the Governance of State Bodies was published by the Department of Finance in 2009 and is applicable to all State companies (and State organisations and companies which are sponsored by the State who receive significant funding by the State or interact closely with government departments or other State agencies). It is considered that certain aspects of this Code are relevant to the governance

of the Schemes, despite the fact that the funding for those companies comes not from the State but from the relevant industry sectors. This is because it is necessary for the attainment of the environmental objective and recycling target that the DECLG maintains a degree of oversight and control over the Schemes and that the boards of such Schemes are responsible directly to the Minister. Overall, however, the Schemes must operate as semi-independent companies within the commercial sector, and therefore the Irish Code of Practice for the Governance of State Bodies is not entirely applicable. For that reason we would not recommend adoption of this Code.

OECD Principles of Corporate Governance (2002)

In 2002 the Organisation for Economic Cooperation and Development (OECD) prepared a document called Principles of Corporate Governance which sets out at a very high level the key principles of Corporate Governance applicable to any framework of any of the Member States within the OECD. This focuses in particular on the rights of shareholders, the equal treatment of shareholders, the role of stakeholders, disclosure and transparency obligations and the responsibilities of the board. While it does not represent an appropriate model in and of itself, it provides an appropriate benchmark for assessing the relevance and appropriateness of particular governance principles contained in other Codes.

The Governance Code (2012)

The Governance Code is a Code of Practice for good governance of community, voluntary and charitable organisations in Ireland. [4] These entities are principally established as companies limited by guarantee and not having a share capital. Directors of such companies are typically not remunerated for their work. One of the main concerns of entities in the community and voluntary sector is to seek to re-assure their State and EU funders that funds are being dispersed to various beneficiaries in the community in a cost efficient and transparent manner. The Governance Code is designed specifically with this imperative in mind and has been drafted very broadly to encompass a wide variety of entities. Whilst we would not recommend that it is adopted wholesale, we have drawn on certain of its provisions in our bespoke Code of Governance set out below.

4.2 A bespoke Corporate Governance Code to apply to all Schemes

Further to our desk review, and given our understanding of the functioning of the Schemes, our recommendation is that a bespoke Code of Governance is drafted which will meet the needs of the DECLG. Each Scheme would be required, when signing up to its SLA, to adopt the Code of Governance, at board level, so that it applies to each Scheme.

The advantage of a bespoke Code is that the DECLG can address the exact points which are currently of concern and account for these in the Code. This is a low maintenance solution for the DECLG as, once adopted, the positive obligation is on the Scheme to abide by its terms. The clause in the SLA requiring the Scheme to adopt the Code will also be worded so as to enable the DECLG to revise and update the terms of the Code. Schemes will be

[4] See www.governancecode.ie. The Governance Code was developed by a Working Group comprising representatives of organisations from the Community, Voluntary and Charitable Sector.

required to make such amendments as are required to their corporate constitutional documentation (normally Memorandum and Articles of Association) to ensure that these comply with the provisions of the Code.

We set out below our recommendations as to the key provisions of the bespoke Code, which are designed to remedy the DECLG's current apprehensions in relation to lack of transparency at board level by the Schemes.

4.3 Content of the Code of Governance

4.3.1 The Board of Directors

4.3.1.1 Membership and Representation on the Board

We would recommend that the DECLG continues to carefully address the issue of who should sit on the board of each Scheme. The Code can mandate that the board of directors involves representatives of significant economic operators and other stakeholders. A key issue will be bringing the correct mix of skills to the boards of directors of the Schemes. It is possible to specify in some detail that, of the board of directors at any given time, a specified percentage should be made up of customers of the Scheme, industry and other specified stakeholders etc. We are aware that various stakeholders hold the view that careful consideration needs to be given to the level of 'representativeness' of the Schemes boards. Please see further Annex 2 to this Report in this regard. Rather than the DECLG mandating specific percentages of representation on each board, it is recommended to include a clause in the Code to the effect that the Board of each Scheme shall be representative of all relevant stakeholders, that any Board member who has resigned from or otherwise left a producer company shall immediately resign from the Board, and that each Board shall include a certain number of independent Board directors. It is interesting to note that the Eversheds Report[5] which analysed the impact of board composition on company performance (in particular in the financial sector) noted that overall, better performing companies had a higher proportion of female directors and a higher proportion of independent directors.

4.3.1.2 Rotation of Directors on the Board

The Code can also mandate the length of term of a directorship, and it may also oblige a rotation of new directors over a given period. It should be noted that the tenure of any given director does not per se impact on good governance. There is no fixed best practice model as the appropriate length of tenure of a directorship will vary considerably from sector to sector and depending on the nature of the company, its aims, ethos etc. This is also reflected in the Eversheds Report[6] which concludes that adopting a rules-based approach to how long directors should serve is generally inappropriate. We have analysed the current directorships of the Scheme which demonstrate that to date there has been limited rotation. However, many of the Schemes are relatively new entities so the opportunity for rotation has been limited.

[5] Measuring the impact of board composition on company performance; The Eversheds Board Report 2011
[6] The Eversheds Board Report 2011

Typically in companies where the directors are required to rotate the procedure would be that a portion (one quarter, for example) would be required to retire at each AGM and that those to retire should be those who have been longest in office since their last appointment. The new directors can then be elected by the members. The main advantage to obliging directors to rotate is that there is a guarantee that a fresh approach will be injected into a given Board at specified intervals, and that the Board is comprised of directors who are up to date with the latest technological and process developments. However, we recognise that smaller Schemes may find it difficult to source new directors at regular intervals who are representative of the membership, and that it is important for the Schemes to retain 'corporate memory' by keeping directors on the board for a sufficient period of time.

We recommend that if mandatory rotation is the preferred option, retiring directors should be eligible for re-nomination and appointment to the Board up to a maximum of serving two consecutive terms or two terms over their life. We also recommend that Directors should not be permitted to sit on a Board indefinitely and consider that a maximum term of 10 years might be considered appropriate, subject to rotation (if applicable) as set out above.

4.3.1.3 Remuneration of Directors

The levels of remuneration of the board of directors can also be addressed in the Code, either by prescribing maximum levels, or by reserving decision making on remuneration to the members of the Scheme. We are cognisant that mandating fixed or maximum remuneration for directors of the Schemes may be viewed as an unwarranted interference in the autonomy of the Schemes and would therefore urge that careful consideration (if necessary in collaboration with the Schemes) is given to whether imposing remuneration levels is a realistic and practical solution. It is recommended that the Code should refer to the fact that remuneration shall be in line with industry standards, and that in the interests of transparency and accountability to members, Board directors' remuneration and benefits shall be published annually, together with information on levels of attendance by individual Board directors at meetings, sub-committees and AGMs.

4.3.1.4 Role and Function of the Board

We recommend that the Code specifies that the directors should exercise full and effective control over the activities of the Scheme and should monitor executive management and performance. Provisions such as this are designed to ensure that best practice in Corporate Governance is promoted and that transparency is encouraged. We recommend that the Code also provides for specific functions or obligations for the chairperson of the Board, including an obligation to keep the Minister advised of specified matters of significance arising in respect of the Scheme, and to brief the members on the functioning of the Scheme at given intervals in time. Depending on the level of concern of the DECLG around the internal financial regulation of the Schemes, the DECLG could also mandate that each Scheme's board of directors operates audit and finance sub committees. Typically such committees are composed of a subset of the main board of directors with specific expertise

and will retain specific responsibility for control of the finances of the Scheme. The Code can specify how often directors should meet and can also mandate that directors engage with the Members of the Scheme at specified intervals of time.

4.3.2 Reporting, Transparency and Information

In order to ensure the effectiveness of reporting we recommend that the second chapter of the Code addresses transparency and imposes information reporting requirements on the Schemes. These would include an obligation to furnish the DECLG with audited accounts annually (and could extend as far as receiving quarterly management accounts if the DECLG considered that this was merited). This chapter of the Code should also include detail on the information in relation to the carrying out of the Services and the meeting of Targets which the DECLG requires in order to report onwards to the European Commission. The DECLG has freedom to mandate the manner and frequency with which such information comes to it and should carefully consider how best and how often to receive this information.

A related issue which can be neatly dealt with in the Code is the external information which the Schemes routinely provide in the public domain (by way of advertising campaign or otherwise).

The principles and objectives underpinning the requirements for greater levels of reporting, transparency and information can be found in the Aarhus Convention, which was ratified by Ireland on 12 June 2012, and the EC (Access to Information on the Environment) Regulations 2007-2011.

4.3.3 Cooperation between Schemes

We recommend that the Code mandates that Schemes (either within a stream or across streams) shall cooperate with each other and with producers who have chosen to self-comply to ensure that information provided to the public is at all times clear and consistent, and that operational activities which might lead to synergies and cost savings are explored and undertaken where possible.

This may necessitate either a particular officer/director within each Scheme being nominated as the responsible officer or it may require that a representative from each Scheme meets at specified intervals to ensure that this obligation is respected. The DECLG may wish to go further than this by mandating that the Schemes engage with one another with a view to launching cross Scheme/ cross stream education and awareness initiatives. The DECLG should be aware that such cooperation must at all times occur within the confines of applicable competition law.

4.3.4 Membership of the Scheme

The DECLG should consider whether it wishes to impose on the Schemes any particular requirements in terms of their members and membership of their Scheme. We understand that the DELCG may not wish to mandate many particular rules in this regard but have briefly outlined below some issues which the DECLG may wish to consider including.

- Whether it wishes to specify any conditions attaching to membership or to specify that membership should be open to all producers;
- Whether it wishes to specify permissible termination events for membership of the Scheme;
- Whether it wishes to specify any parameters in terms of fees for membership;
- Whether it wishes to specify the type of records the Schemes should hold on their members;
- Whether the Schemes should have any obligations towards their members in terms of training/educating them in data collection or the applicable regulatory environment;
- Whether the Schemes should have particular obligations vis-à-vis monitoring compliance of their members; and,
- Whether it wishes to establish principles to govern the admission of new entrants to a Scheme, who previously self-complied, and scale fees accordingly (in particular to address the question of back fees).

This would also be the appropriate place to mandate that the Schemes provide transparent information in relation to their membership. The Code could require the Schemes to publish up to date membership lists quarterly (or at other specified intervals) either on their website, or directly to the DECLG (having regard to the Data Protection implications for the Schemes and the DECLG.)

4.3.5 Objects of the Scheme

We recommend that the Code of Governance specifies that each Scheme's Objects (which would be contained in their Memorandum and Articles of Association) include a clause to the effect that they shall administer the Scheme as approved by the Minister for the DECLG in accordance with the applicable law and Regulations and in accordance with their SLA with the DECLG and this Code of Governance.

4.3.6 Conflicts of Interest

Directors must understand and manage potential conflicts of interest by making appropriate declarations of their interest and by refraining from voting on matters in which they have an interest.

In this regard we recommend that the Code provides that directors must inform the Board of any potential or actual conflict of interest. A director who has a conflict of interest which is being discussed during a board meeting should absent themselves for the part of the meeting during which the matter is discussed. Such a director should not participate in any vote unless in exceptional circumstances which are clearly documented the Board has expressly determined that it is appropriate for him or her to do so.

5. Other Legal considerations

5.1 Fees and charges

The DECLG has no express legal power at present specifically enabling it to impose charges, either for a one-off fee for processing applications for Scheme approval or an on-going annual approval fee. It is recommended that legislation should first be adopted to provide a statutory basis for the imposition of any such fees or charges. It is recommended that the relevant provisions be included in primary legislation rather than in a statutory instrument. While the Minister has general powers under sections 53A to 53M of the Waste Management Act, 1996 (as amended) (the Act) to make Regulations for '*any matters consequential on, or incidental to'* the various enumerate powers in relation to the Schemes, it is not certain the imposition of an application processing fee, or an annual approval fee, would be considered consequential or incidental to the various powers listed specific to each individual Scheme.

ANNEX 1 SAMPLE TABLE OF CONTENTS TO AN SLA

Draft Proposal for a Service Level Agreement

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ANNEX 2 SUMMARY OF RESPONSES OF STAKEHOLDERS IN RELATION TO THE CORPORATE GOVERNANCE FRAMEWORK

Consultation Question: Should service level agreements or contracts be put in place to manage the performance of compliance schemes?

The waste management industry, existing compliance scheme operators in both Ireland and Northern Ireland agree that service level agreements or contracts should be in place to manage the performance of compliance schemes. This would ensure greater transparency and accountability in relation to the activities of all compliance schemes.

Retail & Industry representative groups note that the highest standards of corporate governance should apply. Compliance schemes should engage with their individual members and use their considerable experience to develop a system of corporate governance that ensures the highest standards are met. These groups also recognise the need for flexibility and minimising the administrative burden.

In the event that membership of compliance schemes is not made mandatory, self-compliant producers should be subject to equivalent reporting requirements as compliance schemes.

Furthermore, a requirement to include a certificate of compliance in the annual accounts of all producers –both compliance scheme members and self-compliant – would ensure that compliance with the waste regulations is part of the declarations of a producer's annual returns.

Consultation Question: If so, should this Department consider introducing a range of sanctions in our approvals with compliance schemes?

Limited comments were received in the consultation regarding this question.

Retail & Industry representative groups believe that the application of financial penalties should not be an issue if an appropriate arbitration system is put in place to address any issues of noncompliance with approval conditions.

Other Issues highlighted by Stakeholders

- **Lack of Transparency from certain compliance schemes** was a concern for
    - Producers with regards to decisions relating to the procurement/subsidies of waste services.
    - Compliance schemes making information available to the public while other compliance schemes competing in the same waste stream did not (e.g. annual report and member list).
- **Compliance Scheme Board Representation** was a concern for businesses not represented.

- **Compliance Scheme Board Rotation** was a greater concern for producers and business representative groups.
- **Contingency Funding** – The issue of who owns the money in this fund and how this fund is used, and what's happening to the contingency fund when a producer leave a compliance scheme to join another is a source of concern for members of compliance schemes.
- **Abuse of dominant power from compliance schemes** – One case was reported by a compliance scheme where a large compliance scheme A is sponsoring an event but prevented Compliance scheme B to sponsor a category. Another case was also reported where a compliance scheme was using its influence on waste management companies to prevent self-compliers to access evidence of recovery to meet their obligations.
- **Dispute resolution mechanism** which could be used for settling disputes between compliance schemes would be useful.

APPENDIX G: PACKAGING LEVY

Comhshaol, Pobal agus Rialtas Áitiúil
Environment, Community and Local Government

Review of the Producer Responsibility Initiative Model in Ireland

Annex to the Main Report

A Packaging Levy for Ireland?

By Paul K Gorecki,
Economic and Social Research Institute
and Department of Economics,
Trinity College Dublin

RPS ESRI bio Intelligence Service PHILIP LEE SOLICITORS

A Packaging Levy for Ireland?

Paul K Gorecki[1]

Economic and Social Research Institute and

Department of Economics, Trinity College Dublin.

1 May 2013

1. Introduction

The primary purpose of this paper is to consider the feasibility, desirability and merits of a packaging levy as a method to reduce, reuse and recycle packaging and packaging waste. At the present time there is no packaging levy in Ireland. There is, however, a levy on one form of packaging - plastic bags.[2] Instead, producers, either individually or collectively, are held responsible for dealing with packaging and packaging waste. Hence any consideration of a packaging levy needs to take into account current arrangements for dealing with packaging.

The paper is divided into eight sections, with Section 2 setting out the mandate identified by the Department of the Environment, Community, Local Government (DoECLG) for the paper on a packaging levy. In addressing the issues specified by the DoECLG we begin by identifying the rationale and objective of a packaging levy (Section 3). It is only after identifying the objective that attention can turn to the design of the structure of a packaging levy, considering alternatives and selecting the most appropriate option (Section 4).

There are frequently many alternative policy instruments that can be used to meet a particular policy objective of government (e.g. Trebilcock *et al*, 1982). The environment field is no exception (e.g. Helm, 2005; Watkins *et al*, 2012). However, in considering alternative policy instruments to a packaging levy as a method of reducing packaging and packaging waste, attention is confined in Section 5 largely to Extended Producer Responsibility (EPR), the mechanism currently used to manage packaging and packaging waste in Ireland and most other Member States (Watkins *et al*, 2012, Table 7, p. 104). EPR takes the form of specific producer compliance schemes to deal with particular waste streams that typically permit producers to act collectively through a Producer Responsibility Organisation (PRO), such as Repak Limited (Repak) for packaging in Ireland.

[1] I should like to thank Olivier Gaillot, Lorcan Lyons and Sean Lyons as well as Roger Harrington and his colleagues at the Department of the Environment, Community and Local Government for valuable comments and suggestions. The paper contains no confidential information. It was commissioned by the Department of the Environment, Community and Local Government as part of the Review of the Producer Responsibility Initiative Model in Ireland. The usual disclaimer applies. Contact email: paul.gorecki@esri.ie.

[2] The European Court of Justice found that "plastic carrier bags handed to customers in shops, whether free of charge or not, constitute packaging within the meaning of the [packaging] directive [94/62]." Paragraph 59 of *Plato Plastik Robert Frank GmbH v Caropack Handelegesellschaft mbH,* Case C-34/101, 29 April 2004. See http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:62001CJ0341:EN:HTML. Accessed 14 August 2012.

An economic analysis of a packaging levy cannot take place in a vacuum. Hypothetical introduction of a levy has to be compared to an alternative; in other words, what would happen in the absence of a packaging levy – the counterfactual. One typical counterfactual is business as usual. Hence in Section 6 we compare the introduction of a packaging levy with a business as usual situation, in which there is an EPR. This raises a number of issues, including to what extent a packaging levy and an EPR are complements, so that they can be used in tandem, and to what extent are they substitutes, so that a choice has to be made between EPR and a packaging levy.

While the focus of the paper is on the merits of a packaging levy, an important secondary purpose is to consider deposit and refund schemes such as reverse vending machines either as separate stand alone initiatives or jointly with a packaging levy (Section 7). The final section of the paper addresses each the issues raised by the DoECLG (2012a) in its mandate for consideration of a packaging levy.

2. Background: Mandate and Policy Context

The Programme for Government states, in its discussion of a 'Sustainable Waste Policy,' that the Government "will drive a waste reduction programme through an extension of producer responsibility initiatives and a levy on packaging after appropriate consultation" (Department of the Taoiseach, 2011, p. 61). A consultation exercise was launched by the Minister for the Environment, Community and Local Government (the Minister) on 27 May 2011, "to examine options regarding the introduction of a possible packaging levy" as part of a waste reduction strategy.[3] Four issues were identified in the consultation:[4]

- The overall views by stakeholders on a packaging levy;
- How a packaging levy might be operated;
- International experiences of similar levies; and
- How a possible packaging levy might be structured in order to contribute to a reduction in packaging waste.

Sixty-eight submissions were received by the closing date of 5 August 2011.[5]

The Department of the Environment, Community and Local Government (DoECLG, 2012) subsequently commissioned an examination of the issue of a packaging levy that seeks:

> (i) an economic analysis of the possible effects of a packaging levy, (ii) options on how a possible packaging levy might operate, (iii) possible alternatives to a packaging levy which would yield corresponding reductions in packaging (iv) how might a packaging levy work in tandem and affect the operation of the compliance schemes and (v) an

[3] http://www.environ.ie/en/Environment/Waste/ProducerResponsibilityObligations/PackagingWaste/News/MainBody,26477,en.htm. Accessed 5 July 2012.
[4] http://www.environ.ie/en/Environment/Waste/PublicConsultations/. Accessed 5 July 2012. It should be noted that no consultation document setting out the parameters of the packaging levy and related issues was issued.
[5] http://www.environ.ie/en/Environment/Waste/PublicConsultations/SubmissionsReceived2011/. Accessed 5 July 2012.

examination of initiatives such as deposit and refund and reverse vending both as stand alone options or in tandem with a packaging levy (pp. 16-7).

This was part of a larger project on the Producer Responsibility Initiative (PRI) that was announced by the Minister on 29 June 2012.[6]

3. A Packaging Levy: Rationale and Objective

The objective of a packing levy is to reduce the level of packaging, while at the same time increasing incentives for increased recycling, reuse and recovery. [7] By placing a tax or levy on packaging less packaging will be used.[8] The relative price of packaging-intensive goods will increase relative to the price of less intensive packaging goods causing a substitution of the latter for the former. In addition a packaging levy will create an incentive for goods to become less packaging intensive through, for example, improved technology. The nature of packaging may also shift more towards packaging that can be reused or recycled. For example, if glass containers can be used (say) 12 times whereas a PET container[9] can only be used once, then the packaging levy for glass containers is spread over 12 uses compared to one in the case of a PET container.[10,11]

While the object of the packaging levy might be clear, it nevertheless raises two further issues. First, why should packaging be reduced since it performs many valuable functions "such as preservation, sanitation, security (from theft and tampering), safety and consumer convenience" (Porter, 2002, p. 31), and second, by how much should packaging be reduced. It is necessary to set out the rationale for reducing packaging in order to be able to set the appropriate levy. This needs to be done with some precision or else too much or too little packaging will be used. Vague reference that there is too much packaging and it needs to be reduced is of little assistance as a guide to policy. It could, of course, be argued that setting a packaging levy is likely to be subject to considerable margin of error. However, that does not vitiate the case for carefully considering the rationale for a packaging levy, since at a minimum it will guide research in terms what information is required in order to set the appropriate levy.

Typically, it is assumed that markets work well and that governments only should intervene when there is a market failure. In the case of packaging if what the consumer pays reflects what the packaging cost then it might be thought that the market is working well and there is little or no reason for government to intervene. However, if there are costs that are not reflected in the price

[6] At the same time the Minister announced a public consultation which ran until 25 July 2012. For details see: http://www.environ.ie/en/Environment/Waste/News/MainBody,30642,en.htm. Accessed 5 July 2012.

[7] This is consistent with, for example, the discussion in Section 1 concerning the Programme for Government and the Minister's announcement concerning the consultation on the packaging levy.

[8] Unless, of course, demand is completely inelastic. While this may be the case in the short run this is much less likely to be the case in the longer run as technology is able to offer a greater range of packaging solutions. For example, if the levy is weight-based then this might result in the greater use of lighter packaging material.

[9] I.e. polyethylene terephthalate.

[10] Furthermore, if the consumer has to pay for packaging separately that can be reused they are more likely to reuse the packaging. If the consumer, for example, has to pay for a plastic bag, they may reuse it rather than pay for a fresh plastic bag each time they go shopping. However, it is not clear that such reuse characterises other types of packaging.

[11] The way in which the packaging levy would vary with the degree of reuse is set out in equation (1) below.

then that may constitute a rationale for a packaging levy. These unaccounted for costs are referred to as externalities. These external costs are borne by third parties that are not involved in the transaction between the seller (e.g. the manufacturer/wholesaler/retailer) and the buyer (e.g. the consumer). But what can these costs be that merit government intervention?

There are several possible classes of externalities associated with packaging:

- *Excessive use of virgin resources*: virgin resources such as forests, water, fossil fuels,[12] and minerals may be underpriced through inappropriate subsidisation and a failure to take into account certain externalities in their extraction (e.g. damage to landscape, destruction of forests that serve as carbon sinks, adverse effects on human health and so on).[13] The EU (2008, recital 8) states in its waste legislation that one of the objectives of recovery of waste and the use of such materials is to "conserve natural resources." Although ideally the virgin resources should be priced appropriately by the country responsible for regulating and pricing its extraction, if that is not possible a packaging levy may be set by a country such as Ireland where the virgin resources are consumed to offset the damage from their extraction.

- *Greenhouse gas and other emissions*: the manufacture and disposal of packaging through landfill, incineration and other methods is likely give rise to greenhouse gases such as CO_2, and methane as well as other air pollutants, leading to adverse effects on human health and contributing global warming.[14] There may be leakage from landfills into local soil and water sources contaminating drinking water and harming fish stocks. Minimising the adverse impacts of packaging on the environment and human health is the first objective of EU waste policy (*ibid*, recital 6).

- *Visual disamenity*: packaging may be discarded in the form of litter resulting in visual disamenity, which has, for example, a negative effect on tourism, health (e.g. cuts on broken bottles), and wildlife as well as leading to increased costs of waste collection and disposal.[15] Rivers can become festooned in plastic bags when river levels subside, beauty spots dotted with drink and food containers from fast food outlets while park benches become surrounded by a sea of cider, alcopop, beer and lager bottles and cans. The frequent high winds in Ireland may exacerbate the problem of litter (Convery *et al*, 2007, p. 3).

- *Fly-tipping and other illegal disposal methods*: used packaging instead of being disposed of through collection services, may instead by fly-tipped on the roadside or on vacant ground or possibly disposed of in illegal dumps on a much larger scale.[16] This leads to the problems identified above concerning visual disamenity, greenhouse gases, air pollutants and problems with water supplies as well as increased costs of collection.

[12] Both as energy and as feedstock for plastic.
[13] Smith (2005, pp. 9-10) puts forward this argument.
[14] These issues are discussed further in Gorecki *et al* (2010, Annex A, pp. 106 – 141).
[15] Visual disamenities are discussed by Convery *et al* (2007) in the context of plastic bags in Ireland.
[16] In 2010 uncollected household waste amounted to 265,681 tonnes in Ireland (EPA, 2012, p. 26). However, not all of this was fly-tipped as some could have been used for compost for example. There are reports of large scale illegal dumping of waste generated in Ireland during 2000-2004 in Northern Ireland. For details, see for example, Hogan (2012).

If these externalities, all of which are negative, are appropriately priced and included in a packaging levy then this will result in less packaging being used, more reuse, recycling and recovery. But more importantly it will result in the correct or optimal amount of packaging being used, an issue we return to below.

It is not clear, however, that all the externalities outlined above should be included in any packaging levy. While the existence of an externality is a necessary condition, it is not sufficient, for the inclusion in a packaging levy. This reflects the fact that some packaging externalities are already taken into account. For example, greenhouse gases associated with disposal of packaging waste is already priced through various levies (e.g. the landfill levy set at €65 per tonne from 1 July 2012 in Ireland)[17] and the use of other EU-wide instruments which also effectively price an externality such as the EU-Emission Trading System (ETS) for CO_2. In other words, in considering a packaging levy what are of interest is *unpriced* externalities. A good example was the visual disamenity in Ireland associated with plastic bags which prior to the implementation of plastic bag levy of 2002 was unpriced.

Failure to take into account that an externality that may already been factored into the price of packaging will result in double regulation – reflecting the fact that an externality has already been priced and hence included in the price of packaging. This is not only likely to create additional administrative burdens on producers – which will be reflected in higher prices to consumers as well as putting Irish based business at a competitive disadvantage leading to job losses – but also result in suboptimal use of packaging. The levy should be set so that at the margin, the price of packaging is equal to the marginal private cost of production of packaging, plus the marginal external cost. If there is double regulation then, in effect, the marginal external cost is set too high and too little packaging is used relative to what is optimal.[18] Since, as noted above, packaging serves useful purposes there is a real cost in setting the levy too high. There is, for example, "a highly *negative* correlation between the amount of packaging and the amount of food waste" (Porter, 2002, p. 31, emphasis in the original).[19]

Once the unpriced externalities have been identified attention then turns to estimating the costs of these externalities. Such information is vital for setting the levy at the correct level. However, estimating these costs is neither easy nor straightforward. In the case of the plastic bag levy, which was introduced because of the visual disamenity they caused, no attempt was made to estimate the magnitude of the disamenity according to Convery *et al* (2007) prior to its introduction in Ireland. However, variations in the levy were made as consumption of plastic bags increased subsequent to the initial levy being set. Nevertheless, there are well developed methodologies for measuring disamenity impacts, the cost of greenhouse gases and other pollutants.[20]

A packaging levy is one method or instrument for dealing with the externalities generated by packaging. There are other instruments for addressing the problem, including EPR. Hence in

[17] http://www.environ.ie/en/Environment/Waste/LandfillLevy/. Accessed 6 July 2012.
[18] For further discussion see Pearce & Turner (1992).
[19] This does not mean, of course, that the amount of packaging could not be reduced, in some instances, without leading to increased food waste.
[20] These are discussed in Gorecki *et al* (2010, Annex A, pp. 106-141).

considering whether or not to introduce a packaging levy attention needs to be paid to the relative merits of a levy vis a vis alternatives such as EPR. This need not be a zero one decision. In other words, the issue to be addressed is not necessarily whether to employ a levy or ERP, but rather given the merits of each instrument, when each should be employed. For example, visual disamenity might be dealt with through public awareness information campaigns and/or vigorous enforcement of anti-litter laws. Fly tipping and other illegal disposal methods might be prevented by making household waste collection mandatory – at present in Ireland 29 per cent of occupied households do not use a collection service (EPA, 2012, Table 12, p. 22) – and/or vigorously enforcing the law against fly-tipping. These are issues we return to in Sections 5 and 6 below.

In this paper we take the objective of a packaging levy to be addressing the issue of unpriced externalities. However, it should be noted that arguments have been made that a packaging levy should be used to raise revenue by Comhar (Convery, 2010).[21] This is part of a larger argument that there should be a shift in the taxation system to environmental taxation and less on labour. The basis for increased environmental taxes proposed by Comhar is the polluter pays principle, which is fully consistent with setting a packaging levy that reflects unpriced externalities.[22] In the case of packaging the Comhar proposal is to apply Denmark's rates for glass bottles and by weight for other packaging waste streams. This is projected to lead to increased revenues by €60-80 million in 2014 (Convery, 2010, Table 1, p. 1). As we shall see below in Section 6, the Denmark system is designed to set prices to reflect, on a lifecycle basis, externalities.

Before applying the Denmark levy structure to Ireland, however, three issues need to be considered.[23] First, to what extent are the externalities reflected in the Denmark levy already taken into account in Ireland through, for example, levies on landfill? If this is the case then this would imply that a lower levy rate would be more appropriate. Second, to what extent is the same externality valued differently in Ireland and Denmark? For example, citizens of Denmark may not litter or fly tip with the result that these externalities would be set at zero for Denmark, but would be positive for Ireland. Furthermore, the Denmark rates appear to relate to the situation in 2000, casting doubt on their suitability for application to Ireland in 2013. Third, to what extent are the externalities already dealt with by existing policy instruments, in particular Extended Producer Responsibility, an issue addressed in Section 5 below? If that is the case then a comparison needs to be made between the efficacy of a packaging levy with these alternative instruments. Hence as with most applications of experience elsewhere to Ireland, careful attention needs to be paid to inter-country differences before a simple read across of experience elsewhere is appropriate for Ireland.

4. Structuring a Packaging Levy

An examination of packaging levies suggests a number of different ways in which they can be structured:

[21] DJEI (2011) states that the proposal for a packaging levy derives from Comhar, the National Sustainable Development Council. See also Dineen (2011).

[22] "The polluter-pays principle is the principle according to which the polluter should bear the cost of measures to reduce pollution according to the extent of either the damage done to society or the exceeding of an acceptable level (standard) of pollution." This is taken from the OECD Glossary of Statistical Terms. See http://stats.oecd.org/glossary/detail.asp?ID=2074. Accessed 11 July 2012.

[23] These issues were not raised in Convery (2010).

- *Weight.* Denmark, for example, introduced, in 1999, a levy based on the weight of the packaging across a wide variety of products (ECOTEC, 2001, pp. 228-231). The levy was set to take into account the nature of the material used in the packaging so as "to reduce the environmental impact of packaging, by encouraging the adoption of more benign materials" (*ibid,* p. 232).

- *Volume*. Finland, for example, introduced, in 1994, a levy that was applied per litre for containers for soft and alcoholic drinks (ECOTEC, 2001, p. 222). Lower rates were charged if the container was part of an approved reuse or recycling scheme (*ibid*, p. 222).

- *A flat fee*. Ireland introduced, for example, in 2002 a per unit charge on plastic bags of 15c (Convery *et al*, 2007). The levy was adjusted upward as plastic bag usage increased after an initial steep decline in use.

The issue thus arises as to the optimal way to set the levy, given the objective of pricing externalities which reflect the environmental impact of packaging, so as to optimise the degree of reduction, reuse and recycling of packaging.

Pearce and Turner (1992, p. 9) argue that a packaging levy should be set as follows, where the example used is a beverage or drinks container:

(1) $Lv_i = Wi/(Li.k_i)$. [MDC + MLC].

Where

Lv_i = the levy on the ith container in cents per 100 litres.

W_i = the weight of the container in kg/100 litres. It is assumed that the external costs are related to the weight not the volume.

L_i = litres per container, so that W/L is weight per litre of beverage.

k_i = 1/(1-r) where k is the number of times a given container is reused as with refillable bottles and r is the recycling rate as a fraction.[24]

MDC = marginal costs of waste disposal (cents per kg)

MLC = marginal costs of litter (cents per kg).

Equation (1) has the sensible properties that the levy varies directly with the weight of the container, drops as recycling increases and declines as the externality declines.

[24] Pearce and Turner (1992, p. 9) derive the definition of k from equation r= 1 – 1/k (1a). In discussing the relationship between trippage or the number of times a given container is reused (k) and recycling (r), Pearce and Turner (*ibid*, p. 11) comment, "[T]wo forms of recycling can be accounted for in the formula: re-use rates, as with refillable bottles, and scrap collection rates independently of any re-use. Thus, a glass bottle might be credited with being both refillable and with the fact that much glass cullet is recycled and made into new bottles. Other containers are not refillable so the trippage rates … are recycling rates converted to trips using equation" 1a.

Using this approach would rule out levies based on volume since there is no reason why the volume of a container should reflect the externalities it generates. PET, glass and aluminium or steel containers vary, for example, in the degree to which they can be recycled and reused as well as the greenhouse gases released when disposed of after use. Little or no incentive is provided to economise on packaging which yields lower externalities, since the levy is on the volume not weight. The weight based approach of equation (1) would also rule out Denmark setting of a packaging levy so as to prevent the promoting of one kind of packaging material over another (ECOTEC, 2001, p. 232). The point of a packaging levy is to capture the externalities of different packaging materials, not to suppress the differences, so that packaging materials generating high levels of externalities face a higher levy. In the case of the plastic bag levy, however, the levy is similar to a weight based levy since plastic bags are to a considerable degree homogenous and only one form of packaging included in the measure.[25]

A separate issue concerns where to impose a levy in the chain of production, distribution, wholesaling, retailing and consumption. Recall that the purpose of the levy is to ensure that the externalities generated in the production, use and disposal of packaging are taken into account. It is however, more than just making sure that the price of packaging reflects these costs. It is also about ensuring that incentives are created to use packaging materials in a more effective and efficient manner. In other words, a levy should induce innovation and/or a change in behaviour. Hence the levy should, other things being equal, be imposed on that agent that is best able to internalise the externality and so ameliorate the externality.[26] This may mean that the levy in equation (1) is decomposed and imposed at different levels. For example, the litter disamenity associated with plastic bags might be best imposed on consumers at the point of use, while the externalities relating to environmental and health might be best imposed largely on the manufacturer since they are responsible for the design of the product. However, for own or private brand products where the retailer is likely to have some discretion in specifying the design it might be appropriate to assign a proportion of the packaging levy on the retailer.

Finally, the issue arises at what geographical or political level – Ireland, the EU or the UN – should the value of externalities be decided. To some degree this should be driven by the geographic scope of the externality. In the case of visual disamenity caused by litter or the problem of fly-tipping and illegal disposal these tend to be local in nature[27] and are best dealt with at the level of the Member State. In contrast, CO_2 and other greenhouse gases, lead to global warming and hence should be dealt with at a supranational level.

[25] Plastic bags are not entirely homogeneous. They have been getting lighter (i.e. thinner) over time, even in the absence of levies. Weight based levies are possible. Denmark applies a levy per kg of plastic bags supplied. While a flat levy does not encourage further lightweighting, it may be more appropriate where litter is the main environmental impact being targeted.

[26] Attention also needs to be paid the practical and administrative considerations regarding the level at which to apply the levy in the supply chain. In the case of the plastic bag level in Ireland, for example, the administrative costs are low because it is integrated into the existing value added tax system (Convery *et al*, 2007).

[27] Of course, there may be a cross-border element meaning that the EU could become involved. For example, as noted above packaging and other waste from Ireland was illegally dumped in Northern Ireland.

In the case of excessive resource use of virgin resources, arguably this should be dealt with at the EU level. Estimating the externality and imposing what is essentially a tariff on imports from certain countries is a competence of the EU, not the Member State. Furthermore, the European Commission, acting on behalf of the EU, is in a much better position to advise and encourage, through technical and financial assistance, these countries on how to take into account the externalities generated by the excessive use of virgin resources, a much better solution than trying to deal with the issue via a packaging levy at the level of the individual Member State. Indeed, if the latter approach were adopted, then there is a danger that it could distort trade among Member States. There are also sensitivities around rich countries imposing their views on less well off developing countries, which might be better dealt with at the EU level with its record in the use of soft power.

5. Alternative Instruments for Reducing Packaging Waste: Extended Producer Responsibility

A policy instrument that has gained a considerable currency as a method of reducing waste while at the taking into account the environment and other problems of packaging is to make the producer responsible for dealing with the packaging waste. This is referred to as Extended Producer Responsibility (EPR). It has been defined by the OECD as follows:

> Extended Producer Responsibility is a concept where manufacturers and importers of products should bear a significant degree of responsibility for the environmental impacts of their products throughout the product life-cycle, including upstream impacts inherent in the selection of materials for the products, impacts from manufacturers' production process itself, and downstream impacts from the use and disposal of the products. Producers accept their responsibility when designing their products to minimise life-cycle environmental impacts, and when accepting legal, physical or socio-economic responsibility for environmental impacts that cannot be eliminated by design.[28]

The concept of EPR is used extensively in Ireland and other Member States for dealing with packaging and other waste streams. Instead of local authorities, funded by taxpayers and user charges being responsible waste collection and disposal, for certain waste streams responsibility for these tasks is assumed by the producers.[29] Depending on how the EPR is structured there may be an incentive for producers to take into account the costs of collection and disposal and thus have an incentive to reduce packaging levels. It is an issue we will return to below. The EPR may also contain targets for recovery and recycling.

Smith (2005, p. 8) argues that the EPR differs in three ways from the conventional way in which waste is managed through local authorities:

- EPR shifts *direct financial responsibility* (fully or partially) for the costs of the waste management 'upstream' to the producer, and away from the municipality and taxpayer;

[28] http://www.oecd.org/document/19/0,3746,en_2649_34281_35158227_1_1_1_1,00.html. This OECD webpage contains a guide to the extensive work that the organisation has done in the area of EPR. Accessed 26 July 2012.

[29] The responsibility may be partial or complete.

- EPR often *involves the producer* in some physical aspects of waste management (such as waste collection or the management of collective waste management organisations), in addition to its financing;

- EPR is designed to confront the producer with the costs of end-of-life disposal of their products, and thereby to provide *incentives* for the producer to take account of these costs in designing and marketing their products (emphasis in original).

As a result, when the producer has responsibility for dealing with packaging waste it is much more likely to take into account the costs of disposal and to take action to increase reuse, recycling and prevention in order to reduce the volume of packaging.[30] In contrast, the municipality and householder is not in a position to take such action and even if the municipality charged the householder by weight for the collection service the incentive for the producer to reduce packaging and packaging is likely to be much weaker.

Typically, a municipality[31] will be able to reap the economies of density and scale that are associated with one operator being responsible for collection of household waste in a given geographical area. This is as true in Ireland as elsewhere.[32] Hence for a producer to provide a similar service is likely to be substantially more costly than the local authority (Porter, 2002, pp. 32-33). As a result producers usually band together, through a Producer Responsibility Organisation (PRO), to provide the collection service, in some cases providing funding for the local authority to collect packaging and other dry recyclables as a separate waste stream.[33] In this way producers are able to realise the available scale, scope and density economies.

The EPR has been characterised in EU (2008, Article 8(1)) legislation as follows:

> In order to strengthen the re-use and the prevention, recycling and other recovery of waste, Member States may take legislative or non-legislative measures to ensure that any natural or legal person who professionally develops, manufactures, processes, treats, sells or imports products (producer of the product) has extended producer responsibility.
>
> Such measures may include an acceptance of returned products and of the waste that remains after those products have been used, as well as the subsequent management of

[30] The incentive to take these costs into account will be greater the higher the proportion of the costs that are borne by producers.

[31] In the case of Ireland, of course, in many cases local authorities are not involved in household waste collection. See EPA (2012, Table 12, p. 22) for details by local authority.

[32] On economies of scale and density in household waste collection see, for example, Competition Authority (2005) and DoECLG (2012c); Andrews and Gorecki (2011) cite evidence for Ireland concerning economies of density. In Ireland, ordinary market forces operate in the household waste collection sector, with most collection being the responsibility of private operators, often with little competition over a given geographic area. Hence instead of a municipality organising waste collection through self provision or competitive tendering, private firms, often monopolies in given geographical areas, provide the service. For details see DoECLG (2012b, pp. 29-32).

[33] Waste separation may also be mandated by government in order to facilitate better waste management.

> the waste and financial responsibility for such activities. These measures may include the obligation to provide publicly available information as to the extent to which the product is re-usable and recyclable.

This characterisation of EPR thus links the producer of packaging and packaging waste with responsibility for packaging once the consumer has discarded the packaging with the objective of influencing the upstream decisions of the producer concerning prevention, reuse and recycling.

Smith (2005, p. 10) has identified three common elements of EPR schemes:

- Obligations on the producer concerning the collection ('take-back') of product packaging or end-of-life products (these can be physical and or financial);
- Responsibility for the costs of proper waste management of the collected products and materials;
- Rules or targets governing the methods of waste management of recovered products, for example specifying minimum required rates of re-use or recycling.

In the case of Ireland these targets are likely to reflect those set at the EU level.

These obligations and responsibilities can be discharged by producers acting individually or collectively. As noted above in relation to collection, there are certain advantages in producers acting together or collectively through a PRO rather than alone. There are other advantages of collective responsibility. Some of the activities of a PRO take on the characteristics of a public good, in that these activities are difficult for a PRO to exclude non-PRO members from benefits, so-called free riders. This reflects the fact that typically EPR schemes leave to the discretion of the producer as to whether or not they meet the requirements set out in an EPR collectively, via a PRO, or individually, via self-compliance. The activities that may be subject to free riding includes advertising and public information campaigns that alert the public to use waste segregation correctly, schemes and events to discourage littering as well as one-off campaigns surrounding times when there is likely to be much packaging waste generated, such as Christmas. There are also other advantages of acting collectively. If IT systems, for example, have to be developed to record activity for billing as well as meeting targets, then the fixed costs can be defrayed over a large number of producers, costs that may be prohibitive for an individual producer self-complying.

6. Alternative Instruments: Complements or Substitutes?

In this section we compare a packaging levy with business as usual. This requires specification of the packaging levy based on the discussion in the previous sections, together with the business as usual scenario. In discussing a packaging levy reference will be made to the Denmark experience. Having outlined a packaging levy and business as usual, the merits of each will be compared, in terms of meeting the binding EU targets for reuse, recycling and recovery of packaging and packaging waste.

Setting A Packaging Levy

A packaging levy is set to reflect unpriced externalities. In Section 3 four categories of externalities were identified: excessive resource use of virgin resources; greenhouse gas and other emissions;

visual disamenity; and fly-tipping and other illegal disposal methods. We consider each in turn. In each case we consider whether or not the externality is already priced, in which case a packaging levy is redundant and, if imposed, lead to double regulation and the problems outlined above. The suitability of a levy with respect to the particular externality is also considered. In some instances other instruments might be more appropriate.

For reasons set out in Section 4 we consider that pricing of *excessive resource use of virgin resources* externalities is somewhat problematic at best and, in any event, should be dealt with at the EU rather than the Member State level. At the present time, however, there is no externality price set at the EU level for excessive resource use of virgin resources. This is in some ways in not altogether surprising. It is likely to be a difficult and contentious task.[34] It is difficult because for each virgin resource for each country data would be needed on the externality (e.g. noise near a mine, greenhouse gas emissions and so on), whether the country concerned priced the externality, and if it did not what would be the appropriate price – $VR_{ijk,}$ the externality associated with virgin resource i in country j in location k. It is contentious because as noted above a rich country would effectively be imposing its view on poorer countries. However, even if these difficulties could be overcome further practical considerations would arise.

Suppose the State has estimated all the relevant VR_{ijk}. This information then needs to be used to derive a packaging levy. Assuming that the levy were placed on suppliers of packaging, then each supplier would need to be able to itemise from which country packaging inputs were sourced and, perhaps, the precise locations within the source countries. However, the packaging supplier may not be in possession of the information, since the input may be sourced from an intermediary. Furthermore, depending on input prices packaging suppliers may switch sources constantly, putting a considerable administrative burden on suppliers to identify their packaging sources. Finally, importers of finished products would also be required to provide such information. Needless to say this is likely to be an onerous administrative task that will not only raise business costs, but also public administration since the levy will constantly have to be adjusted to reflect both changing sources of packaging and changing policies towards charging for externalities in the exporting countries. Hence it would seem that setting a packaging levy to include the externalities concerning excessive resource of virgin resource is likely to be costly for an individual Member State as well as inappropriate. It would be much better to address the problem at the EU level.

The next class of externalities is *greenhouse gases and other emissions*. In this class of externalities many are already priced and hence it would be incorrect to include them in a packaging levy. CO_2 emitted from large single point emission sites such as electricity generation stations, cement plants and so on is priced through the EU-ETS. Hence packaging suppliers take into account the increase in the price of energy due to the pricing of carbon and, other things equal, select less energy intensive packaging materials.[35] The price of CO_2 traded in the EU-ETS market around €8 per tonne on 12 July 2012.[36] There is a separate carbon tax in Ireland, which was introduced in 2010, is currently set at

[34] For further discussion see Smith (2005, pp. 33-35).

[35] It is not clear that it makes sense, from an administrative or economic viewpoint, to price CO_2 use in packaging separately through a levy rather than as part of the broader economy as occurs at present.

[36] http://www.eex.com/en/Market%20Data/Trading%20Data/Emission%20Rights/European%20Carbon%20Futures%20%7C%20Derivatives. Accessed 13 July 2012.

€20 per tonne of CO_2, and covers non-ETS emissions – from petrol, auto-diesel, kerosene, marked oil gas, liquid petroleum gas, fuel oil and natural gas, and, from 1 May 2013, solid fuels such as coal and peat.[37,38] The carbon levy is likely to put a premium on lightweight packaging material that requires less fuel when it is being distributed.

There are also levies placed on emissions when packaging is sent to landfill, which from the 1 July 2012 is €65 per tonne.[39] There is no levy on emissions from incinerators.[40] In terms of the impact of leakage from landfills into the soil and watercourses it is not clear that these are not already captured by the landfill levy which will also provide resources for inspection and prosecution. Hence it appears that most of the externalities generated from greenhouse gases and other emissions from landfill are priced and hence taken into account in the generation of packaging and its disposal. To the extent that these externalities are not priced correctly, it seems much easier to simply to vary the current carbon tax either in terms of price or coverage and similarly with the EU-ETS (e.g. a minimum price of carbon), than introducing a packaging levy.

Externalities in relation to *visual disamenity* are already captured with respect to plastic bags through the plastic bag levy, introduced in 2002 and as of 1 July 2007 is set at 22c per plastic bag.[41] It has generally been considered a success (Convery *et al*, 2007; Rademaekers *et al*, 2011, pp. 167-176). It is levied when the consumer purchases goods at the till. It should also be noted that there are other instruments employed by the State such as public education/information campaigns as well as enforcement of the Litter Pollution Acts 1997 to 2009, to reduce the incidence of litter.[42] The evidence suggests that if people observe others have littered they are more likely to litter (Keizer, *et al*, 2008). However, the fact that the plastic bag levy was introduced suggests that a levy on visual disamenity can be a useful supplement to existing methods of ensuring that the visual disamenity of packaging and packaging waste is dealt with successfully. There issue is, however, are there additional visual disamenities that a packaging levy could price? Possible examples might include packaging from fast food outlets. Other forms of packaging may be less likely to give rise to visual disamenity. However, more work would need to be done in order to ensure that they are suitable candidates. In any event such disamenity levies are likely to be relatively limited in scope targeting specific disamenities, not a wide ranging packaging levy.

The final class of externalities is *fly-tipping and other illegal disposal methods.* To some extent these fall under the category of visual disamenity and greenhouse gases and other emissions. They are instances of individuals and firms that choose not to use the existing legal methods of disposal –

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[37] http://www.citizensinformation.ie/en/money_and_tax/tax/motor_carbon_other_taxes/carbon_tax.html. Accessed 13 February 2013. The carbon tax on solid fuels is being phased in: €10 per tonne applies from 1 May 2013; €20 per tonne from 1 May 2014.

[38] Since the externality created by a tonne of CO_2 is same irrespective of the source, ideally there should be one price of CO_2. Since the impact extends beyond the borders of individual Member States and the EU already is involved in negotiating climate change agreements there would appear to be strong arguments for price setting at the EU level as already occurs under the EU-ETS.

[39] http://www.environ.ie/en/Environment/Waste/LandfillLevy/. Accessed 13 July 2012.

[40] http://www.enviro-solutions.com/dailynews/090711-no-incin-levy.htm. Accessed 13 July 2012. It should be noted that any levy on incineration should be set at a much lower level than for landfill. See Gorecki *et al* (2010) for details.

[41] http://www.environ.ie/en/Environment/Waste/PlasticBags/. Accessed 13 July 2012.

[42] http://www.environ.ie/en/Environment/Waste/LitterPollution/. Accessed 13 July 2012.

household waste collection, landfill, and so on. Ideally the levy should be placed on those households and individuals responsible for the illegal disposal methods since they are best placed to address the problem by internalising the externality (i.e. using legal methods of disposal). However, identifying the appropriate set of individuals is neither easy nor straightforward. In any event it is a law enforcement problem, with the probability of detection and the penalty (e.g. fine and jail sentence) acting as quasi levy. The probability of detection can be increased in the case of fly-tipping, for example, by compelling all households either to purchase household waste collection or provide a narrative as to how they dispose of household waste.[43] Furthermore, packaging does not constitute all of the waste disposed of illegally and hence is part of a larger problem that cannot easily be addressed separately. A packaging levy does not appear to be the answer.

Before concluding the discussion on setting a packaging levy reference is made to the Denmark packaging tax, since there may be aspects of a packaging levy which the discussion above omits. The Denmark packaging tax, as shown in Table 1, covers a wide array of packaging and packaging material.[44] The tax is differentiated by material type, with eighteen commodity groups covered. Material types for weight based-rates include plastic, glass and ceramics, laminate; for volume-based glass, cardboard/laminates. Products include paper and plastic bags, disposable tableware, drinks containers, packaging for soap and detergents, lubricants, perfume and margarine. The tax is based on the life cycle approach "with regard to energy consumption, CO2 emission, environmental effects, consumption of fossil resources and waste, based on the most important impacts during the life cycle of the packaging materials."[45] The life cycle assessment according to the EU "is a process of compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle."[46]

Several points can be made concerning the Denmark packaging tax. First, the evidence suggests that the packaging tax did lead to a reduction in the use of packaging. Cela and Kaneko (2011), for example, test for the impact of the tax on imports of paper and packaging into Denmark and find a negative relationship with the tax. Second, the packaging tax is based on pricing the externalities identified in the discussion of the packaging levy. Furthermore, the discussion of the pricing of the externalities above into four groups covers the lifecycle of packaging, from excessive use of virgin resources to disposal through landfill. Third, the Denmark packaging tax has led to a number of distortions some of which were pointed out above. Other anomalies have been identified.[47] While of

[43] Such proposals are contained in the recently announced government policy on waste management. See DoECLG (2012b, p.31).

[44] http://www.economicinstruments.com/index.php/solid-waste/charges-and-taxes-/article/218-. This contains a brief description of the Denmark packaging tax and rates. Accessed 16 July 2012. See also Klok *et al* (2006).

[45] EurActiv (2000).

[46] http://lct.jrc.ec.europa.eu/glossary?search_letter=I. Accessed 17 July 2012.

[47] "One example of the problem is that the contents of the packaging determine whether or not taxes are imposed on the packaging. Jette Thygesen [of Aarhus School of Business] doesn't find this practice logical because the packaging has the same environmental impact regardless of its contents. - To give an example, taxes are imposed on the packaging of tomato purée but not on the packaging of tomato concentrate. But since there is no clear definition of purée as opposed to concentrate from a legal standpoint, it leads to difficulty of interpretation, and it doesn't make things a whole lot easier when the products are marketed under both names at the same time. You often see the words "tomato purée" and "tomato concentrate" on the same product, says Jette Thygesen.

course these distortions can be removed, the fact that they exist demonstrates the difficulty of getting the tax correctly specified and the unintended effects that it may have. Fourth, the packaging tax in Denmark was used instead of the EPR approach.[48,49]

Table 1
Packaging Tax, by Tax Type, Packaging Type and Product, Denmark

Tax Type	Packaging Type	Product
Volume based tax	Bottles with a volume less than 20 litres	Liqueur, wine & beer, mineral water, carbonised lemonade and other products that contain acid (soft drinks).
Weight based tax	Paper, fibreboard, textiles, glass, ceramics, plastic types, laminate, aluminium, steel, wood.	Mineral water, lemonade and other non carbonised drinks, water, vinegar and sweet oil, methylated spirits, detergents, oil-products, pesticides, paint, perfume & cosmetics, anti-freeze & windscreen washers, chemicals, dairy products, food for pets, and sauces, mustard and tomato juice.

Source: ECOTEC (2001, Table 71, p. 229).

In sum, the evidence strongly suggests the scope for a potential packaging levy is, in view of the degree to which externalities are already priced, rather limited. A packaging levy, given the administrative and other costs, is thus a less attractive option than it might be if more of the relevant externalities were unpriced. This does not mean for specific externalities, such as local disamenities, that there might be a case for a levy. However, these are narrowly defined levies, not broad based like the Denmark packaging levy.

Business as Usual Scenario: Extended Producer Responsibility

The business as usual scenario for dealing with packaging and packaging waste is the status quo and changes that can be reasonably anticipated as likely to occur in the near future. There are two principal ways in which the issue of packaging and packaging waste is addressed: first, the pricing of externalities, as set out above; and, second, extended producer responsibility, under which those covered by the obligation can either self comply or join a producer responsibility organisation

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In addition, the taxes imposed vary according to whether the packaging is a part of the product or a part of the service. To give an example, an ice cream cup is subject to packaging tax if the ice cream is not placed in the cup until it is sold, whereas the cup is not subject to any packaging tax if the frozen ice cream is placed in the cup during production. In the latter case, the packaging is considered to be a part of the product. - It doesn't make any sense because, in both cases, the cup is used as a container from which you eat the ice cream and is disposed of afterwards, says Jette Thygesen." http://www.asb.dk/en/outreach/press/pressreleases/latestpressreleases/pressrelease/artikel/researcher_green_legislation_on_packaging_tax_should_be_changed-3/. Accessed 19 July 2012.

[48] ERP (2011, p. 6), IBEC (2011, p. 7), Repak (2011, p. 12) and Watkins *et al* (2012, pp. 101-112).

[49] In Denmark, according to Watkins *et al* (2012, p. 109), [P]ackaging waste management costs for households are included in the budgets of local authorities and are financed via households … . Enterprises are responsible for management of their recyclable packaging waste, and they pay the costs of handling it."

(PRO).[50] There is only one PRO for packaging, Repak Limited (Repak), which was established in 1997 and is a non-for-profit organisation.[51]

S. I. No. 798 of 2007, *Waste Management (Packaging) Regulations 2007*, sets out what is expected of producers of packaging. All producers of packaging are required to separate waste into different streams and have an obligation to ensure that recovery operators have the proper documentation. However, for major producers – those handling 10 (formerly 25) tonnes or more of packaging and with a turnover of more than €1 million – there are certain additional obligations. These include meeting certain recovery and recycling targets,[52] the reporting of certain information, on a quarterly basis, relating to reuse and the source of packaging, the preparation of implementation plans and the requirement to place certain information in local newspapers. Major producers can either self-comply with the requirements of the S. I. No. 798 of 2007 or joint a PRO (i.e. approved body) "in a scheme for the recovery of packaging and packaging waste" (Article 17(1)). Providing the producer acts in a satisfactory manner in participating in the PRO it is exempt from certain provisions of the regulations, which the PRO undertakes on its behalf. To date as noted above there is only one PRO under the regulations, Repak.

Table 2
Progress in Meeting EU Packaging Recycling, Recovery and Diversion Targets,[a] Ireland, 2010.

Targets[b]	Current Progress to Target (2010)
60% as a minimum by weight of packaging waste will be recovered or incinerated at waste incineration plants with energy recovery	74%
55% as a minimum by weight of packaging waste will be recycled.	66%
No later than the 31 December 2011 the following minimum recycling targets for materials contained in packaging waste will be attained:	
(i) 60% by weight for glass	78%
(ii) 60% by weight for paper & board	84%
(iii) 50% by weight for metals	63%
(iv) 22.5% by weight for plastic, counting exclusively material that is recycled back into plastics	39%
(v) 15% by weight for wood	83%

a. As set out in Article 6(1) of European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste, as amended.
b. Target date in all cases is 31 December 2011.

Source: EPA (2012, Table 1A, pp. x-xi).

[50] http://www.environ.ie/en/Environment/Waste/ProducerResponsibilityObligations/PackagingWaste/ Sets out the relevant EU legislation in the area of packaging, together with the accompanying Statutory Instruments which give effect to that legislation in Ireland. Accessed 18 July 2012.
[51] However, ERP (2012, p. 4) applied in 2009 to become a PRO for packaging. The DoECLG has not made a decision to date.
[52] These are set out in Table 2 below.

Sixty two per cent of packaging waste and 97 per cent of packaging recovered in Ireland is accounted for by firms belonging to Repak.[53] The advantage for a producer who belongs to Repak, and participates satisfactorily in the scheme, is that they are exempt from certain requirements as a major producer and that Repak contributes towards the management and recovery of waste placed on the market by its members in such a way that it is able to realise economies of scale and scope that are not open to a single producer.[54] Approximately 2,300 firms are members of Repak which "include the major chains …, major food and drinks producers, importers and distributors, and assorted producers across a range of the major industrial sectors" (Repak, 2011, p. 10). Repak's operations are funded by membership fees which are based on the weight of packaging generated by a producer, but which varies depending on their contribution to the final packaging product (*ibid*, p. 9). The membership fees are used by Repak to manage packaging on behalf of its members. The management involves paying entities that recover waste, with independent auditing to confirm the accuracy of the tonnage claimed for recovery (Repak, 2010, p. 8). It also partially funds the green bin collection of household dry recyclables which includes packaging (*ibid*, p.5). Public education, awareness and prevention campaigns and programmes, including anti-litter, are also supported by Repak (2010).

As a collective organisation Repak is required, like major producers that self comply, to meet certain recycling and other targets, which reflect targets set at the EU level. As can be observed from Table 2, Ireland has successfully met or exceeded all the targets well ahead of schedule. It should be noted that not all recovery and recycling targets by different waste streams are met (EPA, 2012, Table 1A, pp. x-xi), suggesting that these targets are not necessarily easy or straightforward to meet. Nevertheless, despite the success in meeting targets Repak (2010, p. 1; 2011, p. 10) argue that the compliance scheme can be improved by, for example, better enforcement against non-compliant operators.

A Comparison of the Packaging Levy and Business as Usual

A packaging levy and the EPR are two ways of achieving the objective of reducing, recycling and reusing packaging and packaging waste. Member States tend to employ one or the other of these instruments, but not both. Only three Members States of the EU-27 have a packaging tax, with the remaining 24 having a producer responsibility scheme, sometimes combined with deposit refund (Watkins *et al*, 2012, Table 7, p. 104). Other evidence suggests that a packaging levy and EPR are substitutes. Sweden abolished its packaging tax when it introduced producer responsibility obligations (ECOTEC, 2001, p. 216). Finland, as noted above, reduced the packaging tax on drinks

[53] In 2010 there were 106 registered self compliers placing 45,387 tonnes of packaging on the market of which 20,196 tonnes was recovered (EPA, 2012, Table 21, p. 39). The amount placed on the market and recovered by self compilers accounted for 5.2 and 3.1 per cent of the total in 2010 (*ibid*, Table 19, p. 36; Table 21, p. 39). Repak members generated 536,000 tonnes of waste in 2010 and recovered 617,000 tonnes of waste. In other words, Repak members recovered more waste they generated (*ibid*, Table 19, p. 36 and information supplied by Repak).

[54] Repak members still have to manage their own backdoor waste and comply with other elements of packaging legislation such as the essential requirements. These requirements are detailed by Repak. For details see: http://www.repak.ie/files/PDFs/EssentialRequirementsOfPackaging.pdf. Accessed 3 December 2012.

containers if the container was part of an approved reuse or recycling scheme (*ibid*, p. 222). Finally, Denmark has a packaging tax, but no producer responsibility scheme.

This is not to deny, however, that a packing levy in selected instances might complement an EPR. In the case of local disamenities a levy on a particular form of packaging such as a plastic bag could be usefully introduced to meet a particular externality that is not already priced or taken into account by the EPR. Furthermore, there have been suggestions that if a particular producer responsibility scheme is not meeting the targets specified, then a packaging levy might be introduced to incentivise reaching the target, an idea advanced in Commission on Taxation (2009, pp. 355-356)[55] and used in Belgium (ERP, 2011, p.5). However, these are narrowly specified levies, not a wide-ranging packing levy of the kind employed in Denmark.

If a packaging levy and EPR are *substitutes* then it is clearly inappropriate to introduce a packaging levy *on top* of the existing EPR. This is an example of double regulation and will result in the problems, additional costs and possible unintended consequences identified in Section 3 above. Hence the question with respect to the feasibility and desirability of a packaging levy is whether or not it should *replace* the existing system of regulating packaging waste, which is a combination of pricing externalities and EPR.

As already noted above given the extent that externalities are already priced and the existence of an EPR operated by Repak, in order for a packaging levy to be introduced in Ireland would require the abandonment of the status quo and its replacement with a wide-ranging packaging levy. A number of comments can be made concerning such a proposition. The burden of these comments is that there is large number of costs associated with the introduction of a packaging levy, with few if any tangible benefits.

First, it is not at all clear that it is feasible. Some externalities are priced at the EU level such as the ETS and hence would remain, irrespective of the packaging levy in Ireland. Imposing what is essentially a tariff via a packaging levy on the unpriced externalities generated in the excessive use of virgin resources arguably is a competence of the EU and not an individual Member State.[56] Second, abandoning the status quo would require extensive legislative change, in repealing existing legislation and introducing new legislation. Third, estimating the structure and scope of a packaging levy is likely to be a major undertaking. No doubt there will be considerable representation by affected industries and sectors to influence the structure/scope which might lead to anomalies and distortions, some of which were highlighted above in relation to the Denmark packaging tax.

Fourth, considerable uncertainty would be created in the transition from the status quo to the new system, which could harm business confidence. Fifth, there is a danger that the binding EU packaging recovery and recycling targets, although met at the present time, may not be met in the future. This could result in fines and other adverse consequences for Ireland. Hepburn (2006, p. 235) argues that in considering the use of price (i.e. a packaging levy) as opposed to quantitative targets (i.e. EPR) to meet an objective that the latter is likely to be preferable. This reflects the fact

[55] The Commission on Taxation (2009) adds some caveats concerning collection and administrative costs.
[56] This would also be a problem with targets as well.

that given the grave consequences of failure to comply with EU legislation setting a target means that compliance is more likely to be achieved.

Sixth, both the status quo and a packaging levy have mechanisms to ensure that externalities are priced and taken into account in making decisions concerning reduction, reuse, recovering and recycling of packaging and packaging waste. In the case of the status quo the externalities are on the inputs into packaging and packaging waste, such as the CO_2 emissions in energy production, while under the Repak EPR the membership charges relate to the weight of packaging with the fee being higher for those with more responsible for the packaging.[57] In contrast the packaging levy – at least judging by the Denmark example – is carefully calibrated by product and the nature of the packaging material. It is not at all clear that the packaging levy is superior. Indeed, it could be argued that an EPR is superior in that under a EPR approach the PRO is more liable to take into account aspects of packaging and packaging waste disposal that do not relate to the weight – the chosen dimension on which the packaging levy is based. For example, the PRO might identify product design changes that lower packaging disposal costs and membership fees of the PRO members. It is not clear that such incentive mechanisms exist within the packaging levy. Seventh, the existing EPR, Repak, meets the binding EU targets for packaging and packaging waste. Indeed, it comfortably exceeds them as shown above. If the targets had been missed on a consistent basis then there would be a more compelling argument for reform of the approach. This does not mean, of course, that improvements in the competitive landscape under which Repak operates could not improve the performance of the packaging EPR, but that is the subject of another paper.[58]

7. Deposit and Return Schemes: What Role?

Deposit and return schemes can be used to address a subset of the externalities generated by packaging and packaging waste – visual disamenity and fly-tipping and other illegal disposal methods. [59] A deposit and return scheme has been defined as follows: "the surcharge on the price of potentially polluting products. When pollution is avoided by returning the products or their residuals, a refund of the surcharge is granted."[60] Deposit and return schemes can be provided by the market with no intervention by the State such as for aluminium cans in Greece (Hogg, 2002, pp. 104-106). However, interest here centres on instances where intervention by the State is necessary to take into account externalities that the market does not price or take into account. Hence the State mandates a deposit be charged at the point of sale to the customer and a return scheme set up to refund the deposit when the product is disposed of in acceptable way.[61] At present in Ireland there are no

[57] It should be noted that the fees charged by Repak reflect its costs of dealing with packaging and packaging waste and is not set to reflect environmental impacts.
[58] As part of DoECLG's Review of the Producer Responsibility Initiative Model in Ireland.
[59] For a discussion of deposit and return schemes see, for example, Porter (2002, pp. 86-101), and Rademaekers *et al* (2011, pp. 137-165), which examines such scheme for drinks containers in Germany and Denmark,
[60] http://stats.oecd.org/glossary/detail.asp?ID=594. Accessed 15 August 2012.
[61] The purchaser does not necessarily have to be the person that returns the product to collect the deposit. Third parties such as the poor and homeless often collect containers and return them for the deposit (Hogg, 2006, pp. 104-106; Porter, 2002, p. 94).

deposit and return schemes for packaging (or other waste streams) mandated by the State, although other Member States have employed this instrument.[62]

There are large variety of deposit and return schemes, but they appear to be confined largely to drinks containers.[63] Consumers can return the product to the retailer from which it is purchased. Another alternative is reverse vending, which seems to be confined to drinks containers, consists of machines into which a container is inserted and a deposit returned to the customer.[64] The reverse vending machine (RVM) can accept different kinds of containers (e.g. empty returnable or refillable drinks containers, disposable or non-refillable containers). The RVM identifies the container by, for example, its shape and/or bar code. These machines can be located in retail outlets as well as canteens. However, irrespective of the nature of the deposit and return scheme, the fact that they have been confined to drinks containers suggests that wider application to other packaging waste such as plastic wrapping, cereal boxes and styrofoam may be problematic.

The deposit, according to Porter (2002, pp.91-92),

> … should be set equal to the extra social cost of improper disposal over proper disposal. Then, if a person disposes of the product improperly, that person pays the external cost of improper disposal by foregoing the deposit. The threat of a forgone deposit thus becomes a Pigovian tax equal to the marginal external cost.

The external costs relevant to a deposit and return scheme are likely to be visual disamenity and fly-tipping and other illegal disposal methods.

At the present time the existing EPR packaging scheme operated through Repak provides services designed to ensure that packaging and packaging waste is collected and disposed of in an appropriate manner. Repak (2010, p. 5), for example, contributes towards the funding of household kerbside dry recycling and civic amenity centres. Thus to establish a deposit and return scheme would replicate, other things being equal, in part or in whole the existing systems of collection. A deposit and return scheme would therefore raise collection costs.[65] As Rademaekers *et al* (2011, p. 153) note such schemes can be "highly expensive to implement and administer." Nevertheless, there are issues, as noted above, concerning visual disamenity (e.g. litter) as well as the large proportion of households that do not avail of household waste collection services which suggests at least some inappropriate disposal of packaging material which may be sufficient to merit consideration of a deposit and return scheme.

In the discussion above in Section 6 it was argued that a packaging levy was not an ideal solution for dealing with the externality generated by fly-tipping and other illegal disposal methods. The reason

[62] See references in footnote 59 above.
[63] Rademaekers *et al* (2011, Table 34, p. 141).
[64] The discussion of RVM draws heavily on see EC (2006, paragraphs 12-15).
[65] Perchards (2008, 2010) in a report commissioned by Repak also make the same point. They also raise a number of other problems and difficulties with the establishment of a deposit and return scheme for Ireland. It could, of course, be argued that current collection methods in Ireland can be considered deposit and return but with a zero deposit. Societal norms develop such that individuals, for example, may voluntarily deposit containers in civic amenity centres without any need for the return of a deposit to incentivise such behaviour.

adduced for this conclusion was the difficulty identifying those individuals responsible for generating the externality through illegal disposal methods. The deposit and return scheme solves that problem: only those individuals that do not dispose of the packaging in appropriate manner forfeit the deposit and hence incur the social cost of this externality. However, this issue is being addressed through a different policy instrument: all householders will have to show that they are using a household waste collection service or otherwise disposing of their waste in an acceptable manner.[66] In their study on market-based instruments Rademaekers *et al* (2011, p. 204) conclude that "[M]ore cost-effective alternatives [to deposit and return schemes] may be available, such as household waste collection."[67]

In sum, to add a wide-ranging packaging deposit and return scheme to the current system is inappropriate in view of the operation of the existing EPR packaging scheme and proposed policies concerning household waste collection, combined with the high administrative costs of a deposit and return system and the limited experience with deposit and return schemes beyond drinks containers.

8. Conclusion

The conclusion of this paper on the introduction of a wide-ranging packaging levy, other things being equal, can be simply stated. It is likely to generate a large number of costs – to the legislative process, to public administration, to business – with few, if any, tangible benefits. It would be an example of double regulation, given the existence of the packaging EPR administered by Repak and the pricing of many externalities. This is not only likely to create additional administrative burdens on producers – which will be reflected in higher prices to consumers as well as putting Irish based business at a competitive disadvantage leading to job losses – but also result in suboptimal use of packaging, which performs many useful functions.

To avoid such problems, a packaging levy should only price existing unpriced externalities. In that way there would be no double regulation. However, the evidence suggests that there are few, if any, unpriced externalities and hence the potential for a packaging levy is limited. A packaging levy, given the administrative and other costs, is thus a less attractive option than it might be if more of the relevant externalities were unpriced. This does not mean that there may be narrow quite specific externalities where a levy could be introduced, such as the plastic bag levy.

Of course, it could always be argued that one option would be to replace one method of pricing these externalities with another (i.e. a packaging levy). However, in the face of no compelling set of reasons, this does not seem like sensible public policy. There are number of practical administrative problems with this approach. For example, the pricing of some externalities is a matter for the EU and not the Member State.

To add a wide-ranging packaging deposit and return scheme to the current system is inappropriate in view of the operation of the existing EPR packaging scheme and proposed policies concerning household waste collection, combined with the high administrative costs of a deposit and return

[66] DoECLG (2012b, p. 31).

[67] Rademaekers *et al* (2011, pp. 137-165) base this conclusion on detailed case studies of deposit and return schemes for drinks contained in Denmark and Germany.

system and the limited experience with deposit and return schemes beyond drinks containers. There may be specific types of packaging waste or specific externalities, such as some forms of littering, where introduction of an economic instrument might be appropriate. However, this would require careful examination through a cost-benefit analysis.

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APPENDIX H: USE OF AUTO SHREDDER RESIDUES

A. INTRODUCTION

Member States must meet the ELV reuse and recovery targets which increase in 2015 by Directive 2000/53/EC.

Table A.1: ELV Directive Reuse, Recycling and Recovery Targets

	2006	2015
Reuse and Recovery	**85%**	**95%**
Reuse and Recycling	**80%**	**85%**

It must be noted that meeting the 2015 target will be challenging. In 2009, only Austria reported a recovery rate above 95%.

Therefore to meet the 2015 ELV Directive targets (and assuming the remaining 80% of an ELV is recycled), the ELV waste management system needs to recycle at least 5% of an ELV from shredder residues and recover 10% of an ELV from the shredder residues.

The use of Post Shredder Technologies (PSTs) to further process the residue coming out of shredders offer the most cost-effective route for achieving higher targets of the ELV Directive (GHK, 2006).

As part of the brief requirement for the ELV PRI, the DECLG requires an analysis of the most beneficial uses for auto shredder residue.

In order to carry out this analysis, we first examine what are shredder residues and discuss some of the specific issue relating to its composition (e.g. variability, hazardous etc.)

We then describe the current options for shredder residues recovery and their contribution to recycling and recovery targets. Finally, we examine the uses of the outputs from these processes.

B. PRIMARY SHREDDER RESIDUES SEPARATION

Shredder operators but also operate large scale shredding machinery to shred vehicles and other metal waste.

There are three shredders (Dublin, Cork and Limerick) are in operation in the Republic of Ireland and one in Belfast, Northern Ireland. These facilities process ELVs with other materials shredded (i.e. white goods). ELVs processed by shredder facilities must have been treated at ATFs prior to shredding. The shredder facility in Cork only shreds ELVs and other materials, while the facilities in Dublin, Limerick and Belfast carry out a separation process. These facilities produce a shredded ferrous product known as fragmentised scrap and a mix of non-ferrous metals, all of which are exported for further processing. Another waste stream known as shredder residue is also produced which contains all of the dust, dirt, rubber, plastic, foam and other materials which were contained in the vehicles and equipment. In Ireland, this shredder residue has historically been landfilled.

The shredding process flow diagram for Hammond Lane Dublin Facility is shown in Figure B.1.

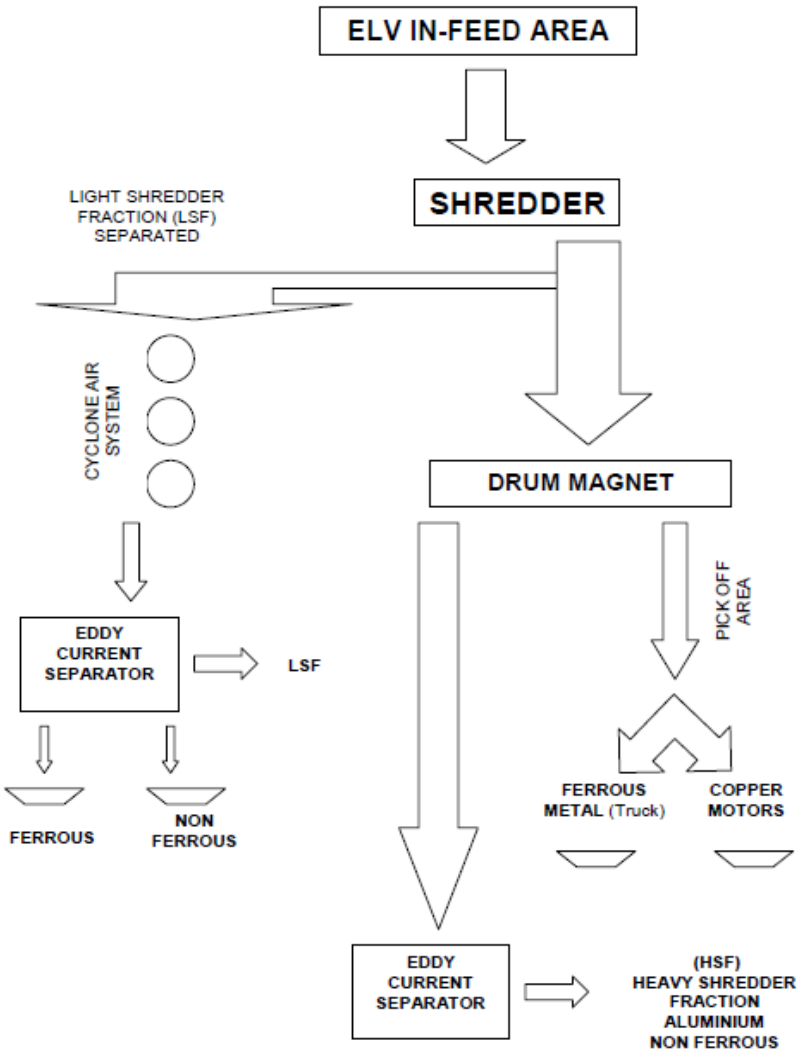

Figure B.1: Shredding Process at Hammond Lane in Dublin (RPS, 2010)

One of the specificity of the Hammond Lane separation process is that

Material outputs from shredding consisted of fragmentised steel, ferrous sweepings, copper armatures, non-ferrous/metal sweepings, heavy shredder fraction and light shredder fraction. The waste stream known as light shredder residue contains all of the dust, dirt, rubber, plastic, foam and other materials which were contained in the vehicles and equipment. Shredder residues during the trial accounted for 21% of the weight of an ELV. This proportion is broadly in line with the average of approximately 20% of the weight of an ELV reported by Zorpas et al. (2012).

Primary shredder residues mechanical separation processes similar to Hammond Lane are based on the different physical properties of the materials within ASR. The main fractions of ASR include non – ferrous metals, plastics, fibres, rubber, and residual metals. The different

properties of these fractions allow for mechanical separation methods including trommel size separation, vibration sieving, air classification, sink and float, eddy current separation, and magnetic separation.

A trommel is a screened cylinder that rotates and separates materials based on size. Vibration sieving separates different sized fractions of the ASR using differing mesh sizes. Air classification separates sieved fractions by size and density. The sink and float method separates fractions based on density. An eddy current separation system allows for non-ferrous metal separation by using a spinning eddy current rotor to repel the non-ferrous metals from the ASR stream. Iron is easily separated from non-ferrous materials with a magnet.

C. COMPOSITION OF SHREDDER RESIDUES

As shown in Table C.1 shredder residues are made of a heterogeneous mixture of ferrous metal, non-ferrous metal (e.g. alloys of copper and aluminium), glass, fibre, rubber, plastics and dirt. Table C.2 shows the composition of the Irish shredder residue produced by Hammond Lane during the shredder trial[1].

Table C.1: % Composition of Shredder Residues (Boughton and Horvarth, 2005)

Materials	Composition %
Rubber (including tyres)	10-20%
Plastics	20-30%
Iron	2-7%
Other (~40% combustibles)	5-10%
Fines (Dirt, glass, paint, etc.)	15-25%
Glass	5-10%
Moisture	6-25%

Table C.2: Composition of ASR (RPS, 2010)

Material	Composition
Ferrous metal	4%
Non-ferrous metals	25%
Plastics	24%
Rubber (incl. Tyres)	8%
Glass	1%
Fluids	0%
Battery	0%
Process polymers	30%
Electrical electronics	0%
Other	9%

[1] This composition was determined by hand sorting of the heavy shredder fraction and light shredder fraction.

The heterogeneity and complexity of ASR composition, due both spatial and temporal variations, as well as the mixing with other source materials shredded (i.e. vehicles and white goods) puts several limits over material recycling processes.

ASR can also contain hazardous substances such as lead, cadmium, and polychlorinated biphenyl (PCB).

D. CURRENT OPTIONS FOR FURTHER ASR RECOVERY

Further shredder residues recovery techniques also called secondary recovery techniques exist. In summary there are two main categories of technology, those based on

- Mechanical sorting of the waste into different fractions such as metals, plastics, glass and rubber that can be recycled and recovered,
- Thermal treatment of the waste stream to generate feedstocks for energy generation. This is exploiting the heating value of shredder residue, which varies from about a typical calorific value of 15 – 22 MJ/kg. It may also include conversion to liquid and gaseous fuels via pyrolysis or gasification of its organic content.

RECYCLING AND RECOVERY RATES

An overview of the technical review of secondary recovery techniques is presented in Table D.1. The rates of recycling (RR) and recovery (RRR) of the PSTs are summarised in Table D.1, are based on the treatment of the residual 20% of an ELV.

The information suggests that mechanical separation technology range in their reported effectiveness in terms of the overall rates of recycling and recovery of material treated, from around 50% (Galloo and Citron – although the Citron process is intended to recover the additional 50% waste material when operating at industrial scale) to 100% (Sult and RPlus).

In terms of recycling, the reported effectiveness of mechanical separation technologies ranges from 74% (Sicon) to 100% (R-Plus and Citron).

The thermal treatment processes are also intended to recycle some material, principally the remaining metallic residues. These thermal treatment processes achieve recycling rates of between 8% (Schwarze-Pumpe) and 33% (TwinRec).

This shows that three technologies (Suit, R-Plus and Citron) are able to achieve overall rates of recycling and recovery of 95% or more.

Technologies that demonstrate enhanced recycling and recovery of ELVs shredder residues will allow Ireland to meet the European 85% target for reuse and recycling. Moreover, the 95% reuse and recovery target can be met by applying in addition thermal incineration techniques or emerging technologies such as pyrolysis or gasification.

CROSS CONTAMINATION ISSUES

Mechanical separation of ASR may pose a technological challenge due to its heterogeneous structure, density, and moisture content. Cross contamination from residual oils in foams, mercury switches, and lead parts such as wheel weights present a barrier when processing and recovering ASR material to meet market specifications (Moakley et al., 2010).

Shredder Residues resulting from the treatment of end of life vehicles contain Polybrominated Diphenylethers (PBDEs) at certain concentrations (EPA, 2012b). In 2010 and 2011, the EPA organised limited sampling and analysis of Irish shredder residues to determine the presence of the PBDEs that have been listed under the EU POPs Regulation. The majority of the levels of BDEs from analysis were found at very low concentrations or not detected. Some samples indicated concentration levels above low POP concentration limits currently being proposed in the study that was commissioned by the EU Commission. Therefore the Shredder Residues produced by Irish shredder is currently not classified as hazardous waste. However, if the shredder residues undergo post shredder treatment (e.g. dense media separation) metals, plastics and glass are removed leaving a residue which may have an increased concentration of certain hazardous materials (e.g. PBDEs congeners). There is therefore potential for these wastes to contain PBDEs and such wastes will be required to be managed as POPs wastes. This will increase the cost of shredder residues treatment.

The EU 'Study on waste related issues of newly listed POPs and candidate POPs' (BiPro, 2010) examined the impacts of these possible changes and made a number of comments / recommendations relating to the effect of the changes on the treatment of WEEE and ELVs.

Part of the PUR foam is prone for C-PentaBDE contamination (mainly PUR foam in cars produced until the year 2000). In order to not interfere with recycling targets it thus is recommended to separate PUR foam from other plastic parts.

The ELV Directive requires hazardous materials and components (including those containing PCB) of end-of life vehicles be removed and segregated from the vehicle so as not to contaminate subsequent shredder waste. However, it is difficult for an ATF operator to distinguish if an ELV contains POP or not (EGARA, 2011), and further more specific information from producers will be required to assist ATFs to meet the requirements of the ELV Directive.

However, in the short term, thermal treatment (energy recovery) of the whole fibre fraction (approximately 5% of the vehicle weight) of the shredder light fraction could be the preferred treatment option. Given the further decline of PBDE contamination in PUR foam, the recycling/reuse of plastic fractions would not cause any problems anymore in 2015. If so, the recycling targets of the ELV Directive would be achievable.

Table D.1: Overview of Post-shredder Technology (Zorpas et al., 2012, GHK, 2006)

***** Overall rate means recycling and recovery rate

Name of technology/ developer	Type of technology	Level of technology development	Approximate outputs from process	Overall rate* %	Recycling rate %
VW – Sicon	Mechanical separation	1 trial plant 8000 t plus 2 under construction. Plans for a 100,000	Shredder granules 36%, shredder fibres 31% metals 30%, wastes 26%.	74	74
Galloo	Mechanical separation	Operating plants	Recycled plastics 9%, metals 30%, refuse derived fuel 13%, wastes 48%.	52	36
Suit	Mechanical separation	Operating plants in Japan	Organic plastic 50%, mineral 20%, metals 10%, water 20%	100	80
R-Plus	Mechanical separation	Operating plants	Organic fraction 60%, metals 5%, minerals 35%.	100	100
Citron	Thermal treatment – ox reducer	1 trial plant (130,000t, 12,000ASR). Plans for a 500,000t (120,000 ASR) plant	Current – Ca Fe concentrate 45%, Zn concentrate 4.3%, Hg 0.7%, wastes 50%. Plan Ca Fe concentrates 45%, Zn concentrate 4.3% Hg 0.7% recovery 50%.	50 100	100 50
TwinRec	Thermal treatment – gasifier	Operating plants in Japan	Metals 8%, glass granulate 25% recovery 52% wastes up to 15%	85	33
SVZ Schwarze pumpe	Thermal treatment – gasifier	Industrial trial plant	Synthetic gas 75%, metals 8% wastes 17%	87	8
~~Reshment~~	~~Mechanical separation thermal treatment~~	~~No pilot or trial plants~~	~~Not available~~	~~Not available~~	~~Not available~~

E. TYPICAL USES POST SHREDDER TREATMENT OUTPUT STREAMS

The classification of the PST Output Streams can be divided into 4 separate categories:

1. Metals
2. Fines
3. Plastics
4. Light Organic Fraction (LOF)

Table E.1 describes the potential application of each output stream and indicates the possible worst and best case scenarios with regard to recycling, recovery or disposal.

Table E.1: Utilisation of Additional Materials in Worst & Best Case Scenarios (RPS, 2010)

Material	Potential Application	Worst case	Best case
Metal	Metal foundries	Recycling	Recycling
Fines	A) Cover for Landfill Sites B) Stowage material in a salt mine C) Road Construction Material	A) Disposal B) Disposal C) Disposal	A) Disposal B) Recovery C) Recycling
Plastics	A) Reducing agent in a blast furnace B) Fuel in industrial findings C) Material re-use	A) Disposal B) Recovery C) Recycling	A) Energy Recovery B) Recycling C) Recycling
Light Organic Fraction	A) Use of LOF for MSWI B) Use of fuel for cement clinker manufacturing C) Use of LOF as filter material for waste water treatment	A) Disposal B) Disposal C) Recovery	A) Energy Recovery B) Energy Recovery C) Recycling

F. ESTIMATED COSTS OF FURTHER SHREDDER RESIDUE TREATMENT

GHK (2006) reported that the approximate costs per tonne of shredder residue for mechanical separation range from as low as €20 (VW-Sicon) to €200 (Citron) and for thermal treatment range from €75 (Reshment) to €200 (TwinRec).

ARN reported that the treatment cost of mechanical separation varies from €90 to €140 per tonne of ASR and are lower than those of incineration (RPS, 2010). Industry sources indicated that the cost of mechanical separation in the UK is in the order of €80 / tonne.

GHK (2006) identified the availability of landfill and the level of landfill costs as a key commercial driver for further shredder residue treatment. To secure the most efficient response they recommended that pressure is maintained to ensure that landfill costs fully reflect private and social costs – with the introduction of landfill bans on ASR when alternative capacity is available as a means of accelerating the introduction of PSTs.

G. ENVIRONMENTAL ASSESSMENT OF THE DIFFERENT ASR TREATMENT METHODS

A limited number of studies have assessed the environmental impacts of ASR treatment methods.

GHK (2006) established the relative environmental benefits of; first the various treatment options compared to landfill; and second of the recovery options against mechanical recycling. It found it difficult to provide definitive conclusions

It also found that the environmental impact of increased recycling and recovery and the reduction in waste sent to landfill depends on a range of factors that includes:

- The material composition of the avoided waste, especially the size of the plastics fraction and the resin composition of the plastics
- The nature of the treatment option, especially for recovery (cement kiln, blast furnace, syngas production and waste incineration have all been examined)
- The efficiency of the recycling in terms of the amount of virgin material displaced for a given mass of recyclates (the substitution rate)

- The assumed levels and types of resources (energy or others) substituted in the case of recovery options
- The choice of how to compare the range of different impacts (the impact assessment has examined a range of impact categories)

Recycling would appear to be the more environmentally beneficial treatment, especially at lower levels of recycling because of the benefits from metal recycling. However, at the higher rates of 95% the level and balance of environmental benefits between recycling and recovery options is less certain.

The increase in treatment to achieve higher rates of recycling or recovery is largely dependent on the increased treatment of plastics, for which relevant and peer approved LCA data is limited. The importance of plastics and the absence of related data make it difficult to formulate firm conclusions on the environmental benefits of increasing diversion from landfill.

Ciacci et al. compared five ASR management strategies:

1. Landfilling,
2. Increased metal recovery before landfilling
3. Increased metal recovery before thermal treatment with energy recovery
4. Advanced material recovery (by PSTs) followed by energy recovery and
5. Feedstock recycling.

A more recent study completed by Ciacci et al. (2010) concluded that the processing of shredder residue will reduce the environmental impact because less ASR will be landfilled, and leaching will be reduced. The leaching can be hazardous primarily when heavy metals are among the components that are landfilled, and could possibly result in groundwater contamination. However, this is unlikely due to the current setup of modern landfills, which has safeguards to prevent leachate from escaping. Agreement exists on the fact that landfill should be the least preferred option.

Additional environmental benefits can be achieved by recycling the materials recovered through the processing of ASR. These materials can be used as an alternative to manufacturing synthetics or mining metals. In addition, the use of recycled materials may result in energy savings when compared to the energy costs of manufacturing metals or plastics from raw materials.

From the Life Cycle Assessment carried out to quantify the environmental impact of the different scenarios, it was found that scenario (4) and (5) above resulted in the highest environmental benefits compared to the present practice, with a slight advantage for feedstock recycling.

As advanced material recovery followed by energy recovery achieved the highest ASR recycling rate, this was considered the best solution.

H. SUMMARY

In conclusion, this study demonstrates that enhanced recycling and recovery of ELVs, possibly in combination with incorporation of ASR into products, will allow Ireland to meet the European 85% target for reuse and recycling. Moreover, the 95% reuse and recovery target can be met by applying in addition thermal incineration techniques or emerging technologies such as pyrolysis or gasification. All these treatment methods were found to result in environmental benefits compared to present landfill practice.

Advanced material recovery (by PSTs) followed by energy recovery and feedstock recycling resulted in the highest environmental benefits.

Advanced material recovery (by PSTs) may present risks of cross-contamination, but there are limited because of the phasing out of hazardous materials in vehicle manufacturing. However, the next ELV shredder trial should confirm the levels of PBDEs and other chemicals.

APPENDIX I: EWC CODES ASSIGNED TO ELV TREATMENT

EWC Code	Description
13 01 09*	Mineral-based chlorinated hydraulic oils
13 01 10*	Mineral-based non-chlorinated hydraulic oils
13 01 11*	Synthetic hydraulic oils
13 01 12*	Readily biodegradable hydraulic oils
13 01 13*	Other hydraulic oils
13 02 04*	Mineral-based chlorinated engine, gear and lubricating oils
13 02 05*	Mineral-based non-chlorinated engine, gear and lubricating oils
13 02 06*	Synthetic engine, gear and lubricating oils
13 02 07*	Readily biodegradable engine, gear and lubricating oils
13 02 08*	Other engine, gear and lubricating oils
13 07 01*	Fuel oil and diesel
13 07 02*	Petrol
13 07 03*	Other fuels (including mixtures)
14 06 01*	Chlorofluorocarbons, HCFC, HFC
14 06 02*	Other halogenated solvents and solvent mixtures
14 06 03*	Other solvents and solvent mixtures
16 01 03	End-of-life tyres
16 01 04*	End-of-life vehicles
16 01 06	End of life vehicles, containing neither liquids nor hazardous components
16 01 07*	Oil Filters
16 01 08*	Components containing mercury
16 01 09*	Components containing PCBs
16 01 10*	Explosive components (for example airbags)
16 01 11*	Brake pads containing asbestos
16 01 12	Brake pads other than those mentioned in 16 01 11
16 01 13*	Brake fluids
16 01 14*	Antifreeze fluids containing dangerous substances
16 01 15	Antifreeze fluids other than those mentioned in 16 01 14
16 01 16	Tanks for liquefied gas
16 01 17	Ferrous metal
16 01 18	Non ferrous metal
16 01 19	Plastic
16 01 20	Glass
19 10 01	Iron and steel waste

EWC Code	Description
19 10 02	Non-ferrous waste
19 10 03*	Fluff-light fraction and dust containing dangerous substances
19 10 04	Fluff-light fraction and dust other than those mentioned in 19 10 03
19 10 05*	Other fractions containing dangerous substances
19 10 06	Other fractions other than those mentioned in 19 10 05

* Hazardous

Source: EPA (2002)

APPENDIX J: REFERENCES

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