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Rethinking economic incentives for separate collection

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1. Introduction

The growing push for a transition to a circular economy in the European Union is putting pressure on member states to develop comprehensive responses. One area where countries need a concentrated effort is waste management policies that yield good results in line with the expected prevention, reuse and recycling targets formulated in the Circular Economy Package (CEP). In fact, according to the recent report "EU Environmental Implementation Review: Common challenges and how to combine efforts to deliver better results" (SWD(2017) 33 - 60 final) "around half of the Member States have to increase effectiveness of separate waste collection, which is a prerequisite for improving recycling both as regards quantity and quality". This report also highlights that one of the main reasons for this situation is that a bad pricing of the different treatment options is "coupled with the **insufficient use of other market-based instruments, such as extended producer responsibility** or "pay-as-you-throw"".

Local administrations are the main actor that can contribute to the fulfilment of the European targets for waste management. By implementing certain tools such as door-to-door collection or pay-as-you-throw schemes it's easy for them to meet European recycling targets. Nevertheless, this does not suffice to provide consistent answers to core policy issues – like waste prevention or reuse. Addressing challenges such as making products fit for a circular economy or reducing waste toxicity are simply beyond their reach.

Unsurprisingly, extended producer responsibility (EPR) plays a growing role within waste management policies. In the last decades, EPR systems have been applied –on different waste streams and with different objectives– in different geographical, political, social, and economic contexts. EPR has even been regulated at European level although for some waste flows only. This regulation, however, has taken place after one or more countries had already set EPR policies.

Despite the fact that further EPR regulation at European level is not foreseeable in the next years, some countries appreciate the strength of EPR and are regulating a growing amount of waste flows through new EPR provisions and schemes.

In many EU Environmental Implementation Review Country Reports sent to EU countries[1] the Commission says that there are insufficient EPR schemes. In parallel, many existing EPR schemes are more and more in the spotlight and face demands for additional requirements to improve their performance and meet higher recycling targets.

EPR is not a single instrument but a set of instruments

In the discussion on producer responsibilities a common idea is that EPR implementation remains restricted to the voluntary collection of waste within the scope of a producer responsibility organisation (PRO). This is a very narrow approach to EPR but is shared by some stakeholders. For instance, the report "Development of Guidance on Extended Producer Responsibility (EPR)" published by the European Commission considers the existence of waste policy instruments such as deposit-refund schemes as merely complementary to EPR in order to increase the efficiency of the whole waste management system (Deloitte, 2014). This is quite surprising because the same document defines EPR as "an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle". This restrictive vision is shared by many PROs all over Europe[2].

In its origin, the concept of extended producer responsibility (EPR) was defined by Thomas Lindhqvist as:

> *"a policy principle to promote total life cycle environmental improvements of product systems by extending the responsibilities of the manufacturer of the product to various parts of the entire life cycle of the product, and especially to the take-back, recycling and final disposal of the product".* (Lindhqvist, 2000)"

This principle is the basis for selecting the mix of policy instruments to be used in a particular case. Hence, EPR needs to be implemented through administrative, economic and informative policy instruments. Its final goal is to address the problem of resource consumption and growing production of waste.

A good EPR implementation, allocates full physical and economic responsibilities to manufacturers and this, in turn, encourages a shift towards providing the functions of the products in a more efficient way. This approach relies on regulation to send proper economic signals to producers to introduce up-stream measures –including redesign and changes in production– that make their products more suitable for reuse and recycling. The expected outcomes include the reduction of the use of toxic and hazardous

1 These reports accompany the document "EU Environmental Implementation Review: Common Challenges and how to combine efforts to deliver better results".
2http://www.expra.eu/uploads/downloads/Best_practices_for_successful_EPR_for_packaging.pdf

substances, and designing products for easy disassembly and recycling. Within a zero waste circular economy the ultimate aspiration of EPR would be to design waste out of the economy. When properly implemented, EPR can also be the necessary push for a shift towards service-based systems[3].

The European Union should look at EPR not solely as a collection system that involves companies and relies on the voluntary participation of the consumers. A broader view on EPR is shared by stakeholders such as the OECD that acknowledges deposit systems and taxation –among others– as EPR tools (OECD, 2016). We share broad approach to EPR; hence using the most appropriate EPR instruments is crucial in order to achieve zero waste.

A consistent EPR is needed, as only work done at the front-end of the production process can design waste out of the system. To achieve a circular economy, EPR implementation needs to be designed as the bridge between waste and products policies.

Inefficient collection systems compromise extended producer responsibility and circular economy

A good EPR implementation, allocates full physical and economic responsibilities to manufacturers. The combination of the economic responsibility of the producers with the physical responsibility of actually managing their end-of-life products is the best way to provide a correct and reasonable inclusion of the costs in the price of a product. It is also a way to give control over the organisation of the system to the actors that are responsible for covering the costs. This is the most direct way to introduce incentives for cost optimisation and improvements into the product systems.

In order to deliver changes in the conception, design and production phases, EPR schemes need to provide **effective collection in the first place** (Lindhqvist & Van Rossem, 2013)**.** A primary goal within an EPR policy is to ensure a high collection rate of the product in focus in order to avoid littering and abandoning products in nature. A related goal is to divert selected discarded products from the general waste stream in order to facilitate a more proper end-of-life treatment and utilisation of the product and its material.

Second to this high collection rate is the need for a **high reutilisation of products and materials through prioritisation of reuse and high quality recycling**. Any EPR implementation should secure that products or their components can be reused, and that their materials are recovered and used for substituting the use of virgin materials. This needs to happen within a **sound treatment of collected products**: before being further processed many products need a pre-treatment in the form of dismantling and/or sorting. The aim of this can be to secure special treatment of hazardous components and materials, and to improve the possibilities for re-use and recycling.

Consequently, if collection systems have low collection it means that most costs are born not by producers but by local administrations. This means that the management costs are not properly internalised in the prize and are being overlooked by the user when making a buying decision. It also means users are paying twice for the collection and treatment – once through the product price and secondly through the waste fee. Equally problematic is when the manufacturer of the product overlooks such costs during the design phase of the product.

Extended producer responsibility implementation through Product Responsibility Organisations (PROs) is not enough

By encouraging high levels of separate collection EPR policy aims on one hand to ensure preparation for reuse and quality recycling of end-of-life products and the collection, treatment and disposal of substances or products that would otherwise be hazardous or harmful within the general waste stream. On the other hand high levels of collection reduce public waste management costs by shifting the burden of collecting and treating part of the waste stream away from local administration services.

In practice the implementation of the policy could be operationalised in a number of ways. One is via a product fee paid by producers to a public entity – ministry, agency, or fund. Then the public administration would organise the collection and treatment. Another is producers to set up a Product Responsibility Organisation (PRO) that then collects fees from them to organise the collection and treatment of the products. These are generally described as collective EPR schemes. More options would be possible with different instruments and allocation of responsibilities.

From the producers point of view, a benefit of setting collective EPR schemes is that it is a more flexible approach that can be used to determine how to achieve the objectives of the policy. Such schemes also reduce costs for the producers as the fees are significantly lower compared to the ones paid directly to public entities. When it comes to separate collection, encouraging voluntary collection has been the instrument of choice within collective EPR schemes; nevertheless, other tools such as economic incentives could also be used.

3 For a comprehensive assessment of current EPR extent and proposal for improvement please refer to the «Redesigning Producer Responsibility» report.

The flexibility provided by EPR schemes reduces the burden on producers, but also has a greater risk that the policy could fail to achieve expected outcomes. In fact, existing EPR schemes show some flaws that make them not suitable to always fulfil the ultimate aim of the EPR philosophy. Recently, an OECD report (OECD, 2016) found that EPR schemes have had only limited impact on eco-design, which was one of the main drivers behind their creation.

A brief assessment of current status of European level regulated EPR can help to visualise these shortfalls:

- **Packaging**: although most of the existing EPR schemes in European countries are reportedly meeting the recycling targets, certain packaging streams are far from achieving good separate collection rates and some products –especially beverage and on-the-go packaging– are prone to be tossed. While EPR schemes may deliver recycling results, there are some issues that are not solved. Littering being the most visible one, but also the costs of collecting and treating packaging waste through the mixed waste stream. Also, not all packaging types and materials are accepted in all collection systems. The fact that much packaging is composite and can't be recycled nor reused shows that current EPR implementation may not provide sufficient incentive for re-design.

- **WEEE**: there is great consensus that collection of large WEEE items is quite good and helps to deliver desired collection rates but most of the smaller items are far from having a good collection rate. Mobile phones, contain valuable and even rare materials, have substantial ecological and social footprint, but are kept in people's drawers according to several researches all over the world. Moreover, at least on third of total WEEE is estimated to be processed in substandard conditions, either in the EU or in third countries.

- **Batteries**: according to the most recent estimations (Perchards, 2015), most of the batteries are still not collected properly and an extrapolation of the collection rates from 2012 to 2014 suggests that around 20 of the 30 EEA are unlikely to meet the 45% collection rate in 2016.

To overcome such shortfalls and achieve high results the flexibility of EPR schemes, needs to be coupled accordingly with other instruments and regulations.

2. Objective of the study

As discussed before, achieving better collection levels would help to tackle some environmental and social impacts that current management systems –including EPR implementation through PRO schemes– give no successful answer to. The study aims at identifying waste streams where the introduction of proper economic incentive through public policies could contribute to the highest collection levels.

In order to define which instruments could be used and to which waste streams should they be applied, we have identified three main fields of interest: the **fight against littering**, the **reduction of losses to the recycling economy** of materials like rare earths and other valuable materials and the **detoxification of the material cycle.**

Within these areas most of the recommendations we make aim to:

- create a **level playing field for the promotion of reusable alternatives** in cases where they exist,
- **reduce the costs of waste management for public administrations**
- **improve product designs**.

Scope

The scope of the work covers an analysis of different economic instruments and their application on several waste streams in OECD countries. Our recommendations throughout this report are generally orientated towards the EU.

The waste streams which we covered are found within the municipal waste stream –be it or not part of existing extended producer responsibility schemes. The analysis includes products currently covered by existing EPR schemes or regulations at EU level, products not currently covered by EPR schemes or covered only in certain member states and products without EPR experiences. We also looked at some types of privately managed waste because of their quantity or environmental impact, and whether their management might be improved through economic incentive systems.

We have included an assessment of three economic instruments: deposit schemes, refundable taxes and buy back strategies. All of them deliver incentives for the final holder of the waste to return it to specific collection points and thus, increased collection rates can be expected. They differ in organisation, the involvement required from different stakeholders and the potential to tackle specific environmental or economic issues.

Methodology

The work has been carried out in two phases. In the first phase we have studied and characterised currently existing economic incentive instruments and waste streams that fall in the scope of the study. We matched the streams with the corresponding incentives and evaluated what was the main purpose of their usage – collection, treatment, reuse etc and their performance. At this stage we also looked at the waste streams' environmental impact, collection, treatment, reuse and recycling options.

In the second phase, we looked at which instrument could help to achieve the above-mentioned EPR targets for a particular product or waste stream. Then we elaborated recommendations for the waste streams at hand and the economic instruments that could be applied. In some cases the suggestions are to improve or broaden the existing economic incentive systems – both private and public. In other cases the proposal is to introduce such systems *ex novo*. The proposals are not necessarily limited to only one instrument as different incentive options may exist. In some cases the proposed economic incentive instrument can be more successful if complemented with an environmental tax or better regulations. It should also be noted that some proposals have been discussed and discarded because they are considered to be better addressed with other instruments, especially taxation; in these cases a complementary proposal is discussed.

Finally, we offer some suggestions for next steps and further research.

Limitations of the study

This study is an attempt to open a discussion on tools that, despite having proven a good performance for many years, are not widespread enough. Thus, this piece of work should be considered as mapping the waste flows and instruments that could be used. Therefore, it does not aim to define in detail how to implement the proposed instruments but rather to indicate areas where it may be interesting to consider the potential benefits of the implementation of these instruments.

The implementation of economic incentives in parallel to or as a first step towards effective EPR scheme is not very elaborated. In most cases further research would be necessary to assess the positive or negative impacts of the application of economic incentives to the waste streams mentioned here. Additionally, the linkages between the economic instruments and the waste fee, the relationship between municipalities or local authorities and PROs need to be further researched. When discussing regulation and market mechanisms, we do not explicitly address the mix between them as this is very country specific and falls beyond the scope of the study.

3. Depiction of potential instruments

Improving separate collection can be done by economically incentivising return of products to collection points. Three instruments are explored in this report in order to complement current waste management systems, with or without EPR schemes.

- **Deposit and refund systems (DRS)**: an initial payment (deposit) is made at purchase and is fully or partially refunded when the product is returned to a specified location.
- **Refundable taxes**: taxes are levied on certain products at purchase and can be refunded to consumer or producer in order to divert certain waste from the mixed waste streams.
- **Buy-back schemes**: some companies encourage return of used items to their outlets by "buying" them back in exchange for a discount on the purchase of a new product.

Both voluntary and mandatory approaches should be considered with a view on how to best meet national environmental priorities, goals and objectives.

3.1. Deposit and refund systems

A deposit is a simple economic incentive where an amount of money is levied when the product is sold, and then refunded when the good or its container is returned after use, providing a clear incentive for consumers to return end-of-life products.

Most DRS are used very effectively to ensure high rates of recovery of drinks containers or other packaging – for instance transport packaging such as boxes or pallets. In the case of beverages, they can either be applied to reusable bottles or to one-way containers. It can be useful in countries which are concerned with the protection of refillable/reusable containers, with the reduction of littering or are generally interested in increasing collection rates of individual waste stream.

Nevertheless, only a few examples exist where deposit is used to encourage the collection of other end-of-life products, including products that could be hazardous or toxic –such as tyres or batteries– when not separated of the general waste stream.

When it comes to deposit-refund schemes, there is a need for policy intervention only where there is an important and identified reason for separate recovery of items that would not otherwise happen on a commercial basis. DRS can be a straightforward way of achieving many of the aims of EPR and no incompatibility exist to implement DRS arrangements within EPR schemes.

From this perspective, the case for compulsory DRS should be further explored for products or materials that would be hazardous or excessively costly if found in the general waste stream –such as batteries– or products containing valuable materials to be re-used or recovered.

DRS imposes straightforward obligations on individual producers but the implementation of a DRS may involve some complexity and costs of operation that should be taken into account when deciding where and how to apply them.

The European Commission released a Communication (2009/C 107/01) describing some "do's and don'ts" from a Community point of view and providing key decisions and practical steps that need to be taken when introducing DRS for packaging. -The Communication can be seen as a guidance to other potential DRS:

- **Transitional period:** A changeover from one waste management system to another demands good and thorough preparation by all key players involved. The changeover to the new system must take place without interruption and without jeopardising the ability of businesses concerned to actually participate in the new system as soon as it becomes operational.
- **Design of the system:** fair, open and transparent. The system should make available a sufficient number of points of return so that consumers can recover the deposit independently of the initial place of purchase and its brand. Any mandatory deposit and return system must be open to the participation of all economic operators in the sector

concerned. It shall also apply to imported products under non-discriminatory conditions. Member States must ensure that there is no discrimination between those products that are exempt and those that are subject to the deposit requirement and that any differentiation is based on objective criteria.

- Best practice solutions: Member States may consider making use of the following practical solutions:
  - **Labelling:** In order to make it easier for the consumer to identify beverages or beverage packaging that is covered by a deposit and return system, it may be considered useful to label the products concerned, e.g. with a common logo
  - **Clearing system:** A clearing system would help to guarantee a levelling out of the different amounts of the deposit collected and returned between the players involved. It is advisable to make the system easily accessible, irrespective of the Member State in which the producer or distributor concerned has its seat
  - **Exemptions for small businesses:** Member States may reduce some of the operational obligations concerning deposit systems for participating small businesses, based e.g. on *de minimis* considerations
  - **Easy import/export:** Member States should avoid any regulatory provisions which would make exports, re-imports or parallel imports of beverages virtually impossible due to particular handling requirements for packaging.

In some cases it may be desirable to combine DRS with taxation. For example, in Norway, a basic tax of 1,15 NOK is levied on one-way plus a modulated tax according to recycling level. If recycling goes above 95% the tax is 0 and if it falls below 25% it's as high as 6,74 NOK. The high collection rate of a DRS compared to voluntary collection systems operates to reduce the amount of this tax (Infinitum, 2015).

3.2. Refundable tax schemes

Refundable taxes are similar to advanced disposal fees (ADF). ADF are fees that are levied on certain products at purchase and are based on the estimated costs of collection and treatment. The fees may be collected by public or private entities and used to finance post-consumer treatment of the designated products. Unused fees may be returned to consumers (OECD, 2016). Refundable taxes are taxes that are set on certain products and that can be returned to consumer or producer when returning used product to certain locations.

Environmentally related taxes, include taxes which have been specifically introduced to discourage production or consumption of a product that damages the environment, or to contribute revenues to an environmental clean-up fund or agency.

Member States may consider national tax-based systems as one form of EPR or as an alternative or complement to EPR policy. The costs of environment-driven tax systems may be lower than the additional costs linked to mandatory deposit systems.

When designing a tax system, it must be taken into account that when a product tax is passed forward to consumers in higher product prices, and if it is levied at a sufficiently high rate, then consumers will be incentivised to reduce their consumption of certain goods and to switch to cleaner, untaxed alternatives (OECD, 2014).

An important aspect to be taken into account when analysing taxation as a policy tool is that it is very common that in parallel to environmental taxes also many exemptions and refund mechanisms exist. The latter should be properly defined to avoid perverse subsidies hence undermining the policy goals.

The OECD/EEA database also records about 175 refund mechanisms in the environmentally related taxes in all. A number of these refunds have been introduced for competitiveness reasons, others for social reasons, etc (OECD, 2006). Across the OECD area as a whole, environmentally-related taxes contribute on average almost 6% of the total tax revenues. The average amount collected in environmentally-related taxes is of the order of USD 550 per capita, equivalent to some 1.65% of GDP in 2010 of OECD countries (OECD, 2015).

In Table 1 one can see a list of environmentally-related product taxes in OECD countries.

Household batteries	Croatia, Denmark, Hungary, Iceland, Italy, Poland, Portugal, Slovakia, Sweden
Disposable tableware	Belgium, Denmark, Latvia
Disposable cameras	Belgium
Aluminium foil	Belgium
Plastic carrier bags	Belgium, Denmark, Hungary, Ireland
Electric light bulbs	Denmark, Latvia, Slovakia
Motor vehicle batteries	Bulgaria, Iceland, Latvia, Lithuania, Poland, Portugal, Sweden
Car tyres	Bulgaria, Canada, Croatia, Denmark, Finland, Hungary, Latvia, Lithuania, Malta, Portugal, Slovakia
Paint, other solvent-containing products	Belgium, Canada
Ozone-depleting substances	Czech Republic, Poland
Pesticides	Canada, Denmark, Norway
Vehicle oils and lubricants	Canada, Croatia, Finland, Norway
Textiles	France, Denmark
Consumer electrical products	Canada, Hungary, Italy, Malta, Poland, Portugal, Slovakia

source: OECD, 2015

Table 1: Environmentally-related product taxes in OECD countries

Where no EPR scheme exists it may seem reasonable to implement a refundable tax scheme that promotes the return of products and, when not, tax can be used to finance collection and treatment of waste by local administration.

Example of EPR using refundable fees

EPR for waste oils in Canada is run by the Western Canada Used Oil Program (operating in four provinces) to ensure recovery and safe disposal of used motor oil as a way to prevent damaging discharges into sewers, watercourses and groundwater. Sales and imports of oil are subject to a fee, or "environmental handling charge", which is then used to finance a "return incentive" paid to authorised collectors when used oil is collected and recycled (e.g. into heating oil). The scheme has close similarities with a conventional DRS, with the significant exception that refunds are paid not to consumers but the enterprises that collect used oil, providing them with an incentive to maximise the amount collected.

http://usedoilrecyclingsk.com/wordpress/wp-content/uploads/2016/04/7-Used-Oil-Containers-Filters-Industry-Management-Plan-in-Western-Canada.pdf

http://bcusedoil.com/wp-content/uploads/2016/06/BCUOMA-Annual-Report-2015.pdf

Criteria for setting a tax

New environmentally related product taxes or the differentiation of existing taxes such as VAT or excise taxes can both be used to create incentives for environmental improvement. The following key principles will help to ensure the environmental effectiveness of these instruments:

· Prioritise the removal of environmentally harmful subsidies before introducing environmental taxes;

· Confine taxes to a small number of priority areas where there is a clear environmental benefit from reduced production or consumption of the taxed product;

· Wherever possible, introduce environmental incentives into the structure of existing product taxes (such as fuel excises), since this will avoid the high costs of setting up and running new taxes;

· Levy any new environmentally related product taxes at an early stage in the production chain, so that there are relatively few taxpaying

firms, which will help to reduce administrative costs;

• Where practicable, implement environmentally related product taxes as an amount per unit or quantity rather than as a percentage of selling price, since this will link the tax more closely to environmental damage;

• Ensure that the level of environmental element in taxation is proportionate to the scale of environmental damage involved, and avoid introducing environmental taxes which are too low to change behaviour. Generally, product taxes of less than 10% of the selling price of products are unlikely to have sufficient impact on behaviour to justify the additional costs of operating the tax, while product taxes that exceed 20% of the selling price may risk excessive tax evasion, except where the product is subject to close monitoring and control, as in the case of mineral oils and motor vehicles;

• Ensure that tax rates are predictably updated in line with inflation, since otherwise the environmental incentives could be rapidly eroded.

Stand-alone operation of an environmental product tax would require the following:

• Identification of relevant producers and importers. Legislation could require producers and importers of certain commodities to register, and these declarations could then be used as the basis for identifying potential taxpayers. Some resources would need to be devoted to tracking down firms that have failed to register. It would be desirable to make firms liable indefinitely for any tax arrears due to a failure to register, plus a significant additional penalty.

• Periodic (annual or quarterly) taxpayer returns of amounts sold of each of the commodities subject to the environmental product tax.

• Significant audit and investigation resources need to be deployed to verify the accuracy of these taxpayer returns. The competent authority needs to be given appropriate powers to obtain access to the firms' financial and sales records on a basis equivalent to the powers held by the principal tax agency.

• Assessment of the tax due. There is a significant move in international tax administration towards giving taxpayers the initial responsibility for calculating the tax due and depositing a corresponding payment with the tax authorities. This speeds up the process.

• Arrangements for tax payment. Taxpayers need to have an incentive for early payment, which can be given by charging an appropriate interest rate on late payments. If subsequent investigation demonstrates that additional tax has been due, the tax agency needs to have powers to collect it and to levy an appropriate penalty for the initial under-payment.

Source: OECD, 2015

3.3. Buy-back mechanisms

Buy back is a common practice in certain retailers, specially large ones. These kinds of programs make it possible for consumers to return used garment or other product and get discount voucher on their next purchase. In some schemes for mobile phones one can return their – not necessarily obsolete – device and recover a percentage of what one paid for buying it or get a discount on next purchase.

Of course, one can see theise campaigns as mere greenwashing and customer loyalty programs; but the point is that they may result in more used clothing or electronics being put in the hands of recyclers than voluntary collection schemes. If linked with next purchase, however, it may encourage unnecessary product turnover from a client or environmental perspective.

Compulsory buy-back mechanisms may be useful to incentivise collection and recycling of certain waste streams without the need for implementing more complicated and expensive schemes.

4. Analysis of existing economic incentive schemes

The following part assesses the existing economic incentives and classifies them according to the following criteria:

- Existing economic incentive schemes with legal requirements
- Existing economic incentive schemes within a voluntary business initiative
- Proposals for existing EPR at European level
- New proposals for non-existing EPR at European level
- Discarded proposals

For each example a factsheet has been elaborated with the following contents:

- **Product**: the type of product/waste to which the economic incentive is applied
- **Consumption / Collection rate / Recycling rate**: market and management figures. The geographic area to which they apply is specified
- **Kind of instrument**: Which instruments exist (Leasing, Deposit-refund, Refundable tax scheme, Buy back, Take back)
- **Market**: if instrument exist for B2B or B2C markets.
- **Start of the chain**: where does the economic incentive start (retailer or producer)
- **Management option**: if it's intended for recycling or reuse
- **Economic reasons**: which economic reasons may exist to implement an economic incentive (valuable material, strategic material, costly separation)
- **Technical reasons**: which technical reasons may exist to implement an economic incentive (no existing process for recycling, no existing collection, difficult to separate at sorting facility)
- **Environmental reasons**: which environmental reasons exist to implement an economic incentive (littering risk (earth), littering risk (sea), toxic product or contents).
- **Environmental background**: brief explanation of the environmental background of the product impact and the benefits of environmental sound waste management.
- **Depiction of existing or proposed system**: a brief explanation of the existing management systems (with or without incentive)
- **Proposal**: our proposal to set an economic incentive
- **Countries**: countries where experiences that can be used as an example and/or that deliver good results exist
- **More information**: documents or websites where more detailed information can be found.

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4.1 Existing economic incentive schemes with legal requirements

Existing incentive schemes (legal requirements)

Product	**Liquor bottles**		
Consumption (Canada)	N/A	tons	
Collection rate (Canada)	> 80%	tons	
Recycling rate (Canada)	N/A		
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme
			Buy back
			Take back
Market	B2B	**B2C**	
Start of the chain	Retailer	**Producer**	
Management option	**Recycle**	Reuse	
Reason to implement an incentive - economic reasons	**Valuable material**	Strategic material	Costly separation
Technical reasons	No existing recyclable process	No existing collection	Difficult to separate at sorting facility
Environmental reasons	**Littering risk (earth)**	**Littering risk (sea)**	Toxic product or contents

Environmental background

Liquor bottles are usually manufactured from glass, but more recently there are also plastic, aluminium and steel containers. The manufacturing initially involved only virgin materials and the existence, if not the extent, of environmental impacts from virgin material and energy resource acquisition and processing is widely acknowledged.

Most public health and environmental benefits from increased beverage container recycling come from the substitution of recycled beverage containers for raw materials in the product manufacturing process and the reduced energy requirements for making new beverage containers, as well as other products such as clothing and recycling containers, from recycled rather than virgin raw materials.(Morris, Smith, & Hlavka, 2005).

Besides recycling of containers, LCA analyses reviewed by GrassRoots Recycling Network (GRRN) suggest potential benefits from refillables over one-way container that could include reductions in: greenhouse gas emissions, carbon monoxide emissions, solid waste generation, energy consumption, and water consumption. Two more studies cited "conclude that refillable glass bottles cost less environmentally than one-way glass bottles do whenever the distance from the bottling plant to the warehouse is less than 3,500 Km with 20 trips for the refillable bottle and a 91 percent recycling rate for the one-way bottle; less than 4,200 Km with 20 trips and a 42 percent recycling rate; less than 2,300 Km with 5 trips and a 91 percent recycling rate; and less than 3,000 Km with 5 trips and a 42 percent recycling rate". (Gesellschaft für Umfassende Analysen (GUA), GmbH. Volkswirtschaftlicher Vergleich von Einweg- und Mehrwegsystemen. Vienna: Austrian Ministry of Environment, 2000.) and RDC-Environment and Pira International. Evaluation of Costs and Benefits for the Achievement of Reuse and the Recycling Targets for the Different Packaging Materials in the Frame of the Packaging and Packaging Waste Directive 94/62/EC. (Draft) Brussels: European Commission, 2001.)

Other benefits are high collection rate resulting in less littering. Refillable containers comprise 72% of the total beer containers sold in Ontario in 2009 and are reused 12-15 times, hence resulting in major virgin materias savings. Besides environmental benefits there are social and economic ones. For Germany "It is estimated that refillable bottles provide five times the number of jobs by “volume of beverage sold” compared to non-refillables" (source: Evaluating End-of-Life Beverage Container Management Systems for California. 2009.)

Description of existing systems

Ontario relies on a municipally funded curbside recycling system for most beverage containers and a deposit-return system for alcoholic beverage containers. There has been a major ongoing battle over deposits in Ontario, with soft drink producers and grocery retailing companies resisting deposits. The Beer Store, the primary distribution channel for beer in the province, has operated a deposit-return system on its containers since 1927, In 2007, the Liquor Control Board of Ontario (LCBO) instituted its Deposit Return program, also known as "Bag It Back" and began collecting 10- and 20-cent deposits on all alcoholic beverage containers, including those sold through avenues other than The Beer Store. Regardless of where they were purchased, these containers must be returned to The Beer Store for the refund (not at LCBO stores). All container deposits are fully refundable. Domestic and Imported beer is sold through all locations, however not all imported beer is returnable for a refund.

The amount of deposit depends on the volume and the type of the container. There are two types split in two volume categories each. For a) Glass bottles, plastic bottles (PET), Tetra Pak containers, bag-in-box the deposit is as follows: up to 630mL: 10¢ and over 630 mL: 20¢. For b) aluminium and steel containers the deposit is divided as follows: up to 1L: 10¢ and over 1L: 20¢.

All costs, such as handling and transportation, are internalized through the Beer Store system. The Beer Store augments its recovery infrastructure through the use of authorised empty bottle dealers to collect used containers in rural markets serviced by LCBO Combination and Agency stores. The Beer Store requires its brewers to pay it a handling fee that is not publicly available. Industry-standard refillable bottles have the lowest fee, while non-standard and nonrefillable bottles have higher fees. The beer industry has taken producer responsibility one step further in Ontario with its "100% packaging take-back commitment." The industry has committed to continuing efforts to recover, through its retail channels, all of its packaging wastes: corrugate, boxboard, paper bags, plastic bags, plastic six pack rings and even bottle caps. The industry claims an audited result of 97.5% total recovery of its whole suite of packaging materials, a figure it intends to improve upon.

Countries

Deposit systems for liquor beverages exist in different provinces in Canada: Alberta, New Brunswick, Newfoundland, Nova Scotia, Ontario, Saskatchewan and Yukon Territory.

More information

Bottle Bill Resource Guide: http://www.bottlebill.org/legislation/canada/ontario.htm

Evaluating End-of-Life Beverage Container Management Systems for California: http://www.container-recycling.org/assets/pdfs/reports/2009-BeverageSystemsCalifornia.pdf

Economic and Environmental Benefits of a Deposit System for Beverage Containers in Washington State http://www.container-recycling.org/assets/pdfs/reports/2004-EconEnviroWA.pdf

Environmental Benefits of Refillable Beverage Containers: http://refillables.grrn.org/content/environmental-benefits

Existing incentive schemes (legal requirements)

Product	**Pesticide packaging**		
Consumption (EU-28)	395,944	tons of pesticide sold	
Collection rate (EU-28)	N/A		
Recycling rate (EU-28)	N/A		
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme / Buy back / Take back
Market	**B2B**	**B2C**	
Start of the chain	Retailer	**Producer**	
Management option	Recycle	**Reuse**	
Reason to implement an incentive - economic reasons	**Valuable material**	Strategic material	Costly separation
Technical reasons	No existing recyclable process	No existing collection	Difficult to separate at sorting facility
Environmental reasons	Littering risk (earth)	Littering risk (sea)	Toxic product or contents
Environmental background	In some countries packaging is treated as hazardous but in many after applying triple rinsing packaging is considered non-hazardous. Pesticides packaging is usually made of HDPE plastic and shares the same enviromental problems as most ot plastic released in the environment. Slow to no degradation, marine and land litter. If the packaging contains some of the pesticides, then it becomes hazardous waste and then depending on the substance nature environmental and health concern may vary.		

Description of existing systems

A report from the meeting of the OECD Pesticide Risk Reduction Steering group in 2004 reads **"Deposit-refund mechanism may be considered to provide incentive for users to bring back used containers to designated collection centres. Eco-tax exemption for pesticide manufacturers participating in collection and recycling programmes (e.g. Belgium) would give a strong incentive to organise or participate in such efforts."** Belgium reported 92% collection – highest among participants.

«The reviewed schemes include those where participation in container management programmes is legally required for all players (e.g. Brazil, Hungary), those that are purely voluntary industry initiatives (e.g. Canada, France, USA), and those based on a mix of regulatory and voluntary actions (e.g. Australia, Belgium, Germany). The group debated whether pesticide container management should be mandatory or voluntary. There was a general agreement that in OECD countries, voluntary schemes work in many places, and mandatory approach can supplement if and where necessary. However, in non-OECD countries, regulation may be more necessary, supplemented by voluntary measures, economic incentives (e.g. to compensate for the perceived economic value of empty containers) and strong training and awareness raising programmes.»

"Collection and removal of used containers (and obsolete pesticides) from farms and other users represent significant risk reduction. Especially in the developing country context, taking them away from users minimises exposure and unsafe re-use of containers for other purposes. The reviewed container management schemes carry out the collection through distributors and retailers (e.g. France), together with private waste management contractors (e.g. Belgium), as well as local governments (e.g. Australia, UK home and garden products)."

Deposit system

A program to manage the proper disposal of pesticide containers was instituted in Maine in 1983, when a deposit law was enacted for restricted-use pesticide containers. However, the law does not include general-use pesticide containers, which, without any controls, end up burned on-site, or in public landfills and incinerators. In 1991, in an effort to keep plastic pesticide containers completely out of the waste stream, the Board began working with pesticide dealers, the non-profit Ag Container Recycling Council (ACRC), and local municipalities, to develop a program where, on a strictly volunteer basis, both restricted- and general-use plastic pesticide containers could be recycled. With oversight and coordination from the Board, plastic containers, collected throughout the growing season, are taken to a transfer station, baled, and then sold and recycled to create new non-consumer products, where chemical purity is not a priority, such as drainage tiles, railroad ties, pallets, fence posts, and speed bumps. Through this program, Maine has recycled an average of 35,000 pounds of #2 plastic annually since 2001. Nationally, since the program started in 1992, approximately 110 million pounds have been recycled.

Countries

Maine (USA)

More information

Report of the OECD Pesticide Risk Reduction Steering Group - Seminar on Pesticide Risk Reduction through Good Container Management (OECD, 2004)
http://www.oecd.org/officialdocuments/displaydocument/?cote=env/jm/mono(2005)12&doclanguage=en

US EPA https://www.epa.gov/pesticide-worker-safety/pesticide-containers

ECPA http://www.ecpa.eu/stewardship/stewardship-activity/container-management-systems

ACRC, US http://www.acrecycle.org/userfiles/files/Fact%20Sheet%20About%20the%20ACRC%202015.pdf

MAINE, US http://www.maine.gov/dacf/php/pesticides/applicators/pesticide_container.shtml

Existing incentive schemes (legal requirements)

Product	**Trichloroethylene – TCE**		
Consumption (EU-28)	50,000-100,000	tons (EU Chem Agency 2011)	
Collection rate (EU-28)	N/A		
Recycling rate (EU-28)	N/A		
kind of existing or proposed instrument	Leasing	Deposit-refund	**Refundable tax scheme** Buy back Take back
Market	**B2B**	B2C	
Start of the chain	Retailer	**Producer**	
Management option	Recycle	**Reuse**	
Reason to implement an incentive - economic reasons	Valuable material	Strategic material	Costly separation
Technical reasons	No existing recyclable process	No existing collection	Difficult to separate at sorting facility
Environmental reasons	**Littering risk (earth)**	**Littering risk (sea)**	**Toxic product or contents**

Environmental background

Trichloroethylene (TCE) is a nonflammable, colourless liquid with a somewhat sweet odor and a sweet, burning taste. It is used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers. Trichloroethylene is not thought to occur naturally in the environment. However, it has been found in underground water sources and many surface waters as a result of the manufacture, use, and disposal of the chemical. It is from the group of volatille organic compunds (VOC).

Affected Organ Systems: Developmental (effects during periods when organs are developing) , Neurological (Nervous System)

Cancer Classification: EPA: Carcinogenic to humans, IARC: Carcinogenic to humans (evidence for cancer is based on kidney cancer, limited evidence for non-Hodgkin lymphoma and liver cancer, as well as, various tumors in animals). NTP: Known to be a Human Carcinogen. (Source: US Agency for Toxic Substances and Disease Registry https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=30)

In December 2016 US EPA identified significant health risks associated with TCE use in aerosol degreasing and for spot cleaning in dry cleaning facilities. EPA has preliminarily determined that these risks are unreasonable risks. To address these unreasonable risks, **EPA is proposing to prohibit the manufacture, processing, and distribution in commerce of TCE for use in aerosol degreasing and for use in spot cleaning in dry cleaning facilities; to prohibit commercial use of TCE for aerosol degreasing and for spot cleaning in dry cleaning facilities;** to require manufacturers, processors, and distributors, except for retailers of TCE for any use, to provide downstream notification of these prohibitions throughout the supply chain; and to require limited recordkeeping. https://www.regulations.gov/document?D=EPA-HQ-OPPT-2016-0163-0001

In EU TCE usage is prohibited since April 2016, except for those granted authorisation or for which authorisation applications are outstanding. (CHEMWATCH, 12.2016)

Depiction existing systems

Refundable tax

In Norway, a holder of waste is entitled to claim a refund for taxes paid on TCE upon delivery of waste containing TRI to a) an enterprise engaged in the recovery of TRI for further sale and that is authorised for this purpose by the competent authority, or b) an approved hazardous waste reception facility. The delivery of waste that contains less than 10 kg of TCE does not entitle the holder to a refund. A holder of waste must enclose with the application a copy of the document that shows that tax has been paid in accordance with the regulations of 11 December 2001 no. 1451 relating to special taxes for the quantity of TCE for which a refund is requested. The refund rate amounts to NOK 25.00 per kg of TCE. The refund amount shall be paid quarterly by the Environment Agency directly to the person or entity entitled to the refund.

Countries

Norway (NO)

More information

Refund of taxes on trichloroethylene (TRI): http://www.miljodirektoratet.no/en/Legislation1/Regulations/Waste-Regulations/Chapter-7/

ECHA data from https://echa.europa.eu/documents/10162/18584504/afa_tce-0018-01-sea_en.pdf/

Rezerø

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4.2 Existing economic incentive schemes within a voluntary

Existing incentive schemes (voluntary business initiative)

Product	Gas containers		
Consumption (Spain, 2015)	72	million cylinders	
Collection rate (EU-25)	>95%		
Recycling rate (EU-25)	>95%		
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme
Market	**B2B**	**B2C**	
Start of the chain	Retailer	**Producer**	
Management option	Recycle	**Reuse**	
Reason to implement an incentive - economic reasons	**Valuable material/ product**	Strategic material	Costly separation
Technical reasons	No existing recyclable process	No existing collection	Difficult to separate at sorting facility
Environmental reasons	Littering risk (earth)	Littering risk (sea)	Toxic product or contents

Background

LPG (Liquefied petroleum gas) is a mix of propane and butane gas in different proportions used for domestic space and water heating, cooking, lighting, thermal desiccation, power generation, industrial heating and automotive fuel. It is available everywhere in Europe since it can be packed and stored in a wide variety of options (cartridges, refillable, cylinders, bulk tanks...) and the transport is easy in low pressure tanks. Thus, this resource is available even in the middle of nowhere and it is specially valuable in emergency situations. Butane is usually for cooking (Indoor use), Propane mainly for Industrial and Commercial.

Domestic consumption is the main market where refillable tanks and cylinders are most used. Although some disposable options exist, in this market, most LPG is distributed in refillable tanks or cyclinders. These refillable containers are costly and companies set a deposit on them in order to recover them after use.

Depiction of existing systems

LPG is used in all the European Union, and so does the associated deposit system. Its functioning is different depending on the country and on the use of the gas and the storage system. For example, in Spain the most common is to use a 12kg bottle with butane for house needs. In Germany more types and sizes of bottles exist.

The most common system is to pay a deposit when starting the supply contract and to get it back when this is cancelled and the bottle returned. This system allows the client to exchange empty container for full ones nly paying the cost of gas. It requires a dense dealer network and places where to change the bottles all over the country, in general they are available in service stations, supermarkets (50% in France), traditional shops and home delivery (Spain).

In some cases, the deposit is not returnable and the customer owns the bottle. In this case, consumer can also change empty bottles to full ones without paying, but they do not get the money back when they return the bottle at the end of the contract. In Germany, they have two different bottle's colour to identify which bottle is which.

Another popular product is the gas cylinder designed for its use in camping. The most popular brand is Campingaz, a gas deliver that operates around Europe. They offer the same exchange scheme but for smaller bottles. The exchange is possible at any Campingaz retailer all over Europe and get a full cylinder for the price of just a refill.

In all cases, when the bottles are refilled there is a professional revision. The branded marketer is responsible of the safety along the distribution chain, the cylinder recertification and the removal of the dangerous ones and the filling. It is necessary to have a commitment from the LGP Industry on safety by not allowing the points of sale any interchange of different branded cylinders.

Countries

All countries

More information

Key features of the LPG Distribution in EUROPE: http://www.wlpga.org/wp-content/uploads/2015/09/Renzo_Bee_Totalgaz.pdf

Existing incentive schemes (voluntary business initiative)

Product	**Beer keg**
Consumption (EU)	21% of beer market
Collection rate	>95%
Recycling rate	>95%

kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme	Buy back	Take back
Market	**B2B**	**B2C**			
Start of the chain	Retailer	**Producer**			
Management option	Recycle	**Reuse**			
Reason to implement an incentive - economic reasons	**Valuable material**	Strategic material	Costly collection/separation		
Technical reasons	No existing recyclable process	No existing collection	Difficult to separate at sorting facility		
Environmental reasons	Littering risk (earth)	Littering risk (sea)	Toxic product or contents		

Environmental background

The first keg (Swedish “kagg”, a barrel) was introduced in 1929. It was invented by the German company Krupp. Its improvement in the 1950s by couplers and fittings provided tightness of filling, which in turn ensured the quality of storage. As from the date of introduction, steel barrels quickly replaced their wooden ancestors and until now continue to dominate the on-trade market. As long as service norms are observed, kegs have high durability (about 200 applications for 30 years) and reliability, withstanding to 25-fold operating pressure. When not reusable anyomre, a steel keg is a fully recyclable product and the resulting stainless steel can be reused in production.

Kegs with a capacity of 20 and 30 l. are currently in the greatest demand in European market, displacing 50 litre kegs.

Overall, European market involves three main types of kegs: DIN - tall and narrow kegs, Euro - low and wide kegs and their modification Plus-keg - steel kegs with a special polyurethane coating, acting as a type of thermostat, as well as protecting the keg from the strain upon impact.

Depiction of system

Most of beer consumption in the HORECA sector is done using beer kegs; in some markets, kegs are also available for household comsumption and typically a 30 euro deposit is set. This deposit is reimbursed once the empty keg is returned.

Countries	All countries
More information	Beer keg market: http://journal.beer/2015/06/11/beer-keg-market/

Existing incentive schemes (voluntary business initiative)

Product	**Beer crate**		
Consumption (EU-25)			
Collection rate (EU-25)			
Recycling rate (EU-25)			
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme / Buy back / Take back
Market	**B2B**	**B2C**	
Start of the chain	Retailer	**Producer**	
Management option	Recycle	**Reuse**	
Reason to implement an incentive	**Valuable material**	Strategic material	Costly separation
Technical reasons	No existing recyclable process	No existing collection	Difficult to separate at sorting facility
Environmental reasons	Littering risk (earth)	Littering risk (sea)	Toxic product or contents
Environmental background	Beer crates are the most popular way of transporting beer bottles. Originally they were made of wood but nowadays plastic is the dominant material. Each brand has its own pool of crates that have a particular colour, size and labelling. Nevertheless, some collective pools of crates do exist.		
Depiction of existing systems	In all countries, refillable crates are used to deliver bottles to bars and restaurants; normally, in the contract for the delivery of beers, the amount of the deposit for the crate is set. As with refillable bottles of beer, when a crate is broken or lost, the deposit is lost. When refillable bottles of beer are available for domestic consumption it is also common to use reusable crates. Some of the countries where this system is found (and its deposit amount) are: Czech Republic (6€) , Germany (1,5€), Netherlands (1,5€) , Norway, Belgium, Denmark... Schoeller Allibert, the market leader in beverage returnable systems offers recycling services. They collect all the used containers and crates, when cleaned, grinded, washed and dried they are ready to be remoulded and re-used, reducing pollution and wastes. If the possibility exists to clean the crates to eliminate the plastic labels with alkaline aqueous medium. After the separation of the dirt and the polymers of the label, the last mentions can be used again and the water too.		
Countries	All countries		
More information	Schoeller Allibert Returnable Plastic: Packaging Solutions https://www.schoellerallibert.com/_assets/brochures/SA+%20Beverage%20Crates%20Brochure.pdf		

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4.3 Proposals for existing EPR at European level

Proposals for existing EPR (legal initiatives)

Product	**WEEE**					
Consumption (EU-28)	8.800.000	tons				
Collection rate	39%					
Recycling rate	35%	source: Eurostat				
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme		Buy back	Take back
Market	**B2B**	**B2C**				
Start of the chain	Retailer	**Producer**				
Management option	**Recycle**	**Reuse**				
Reason to implement an incentive - economic reasons	**Valuable material**	**Strategic material**	Costly separation			
Technical reasons	No existing recyclable process	No existing collection	Difficult to separate at sorting facility			
Environmental reasons	Littering risk (earth)	Littering risk (sea)	**Toxic product or contents**			

Environmental background

WEEE is a complex mixture of materials and components that can be recyclable or need to be treated properly because of their hazardous content, and if not properly managed, can cause major environmental and health problems.

If landfilled, after their interaction with air and water WEEE can leach toxics that pollute the soil and the water and can affect human resources. When treated in under substandard procedures also air pollution appears from the burning of plastics.

Moreover, the production of modern electronic requires the use of scarce and expensive resources. In addition to basic metals such as lead, tin and aluminium, the electrical and electronic equipment we use daily contain a number of rare metals that play a central role in the operation of high-tech equipment. In addition to precious metals such as gold, silver or palladium, these include lesser known elements, such as indium, rare earths or tantalum. Indium, for example, is required for the manufacture of transparent and conductive coatings on flat panel monitors. The rare earth metals neodymium, dysprosium and praseodymium are used for the manufacture of powerful permanent magnets in hard disks and optical units. Tantalum is found in high capacity mini-condensers, for example in printed circuit boards of mobile phones.

What all these metals have in common is the fact that they can not be recovered using current processes of preparation and recovery. On the one hand, this is because the operations of the processes involved in manual and mechanical processing are oriented to the elimination of contaminants and the recovery of traditional materials such as aluminum, iron, copper or gold. On the other hand, although the price of these metals has increased considerably in recent years, it is still too low and volatile to make the recovery interesting from an economic point of view. The future supply of these metals is considered critical, they are not renewable materials that would be removed from their future use without recovery, and a significant amount of the annual worldwide production of these metals are used in electrical and electronic equipment.

The recovery and reuse of valuable materials not only mitigates the environmental and social impacts caused by mining, but it also helps reduce the quantity of greenhouse gas emissions associated with processing of WEEE.

Depiction of existing systems

In Europe, two policies try to increase the rate of collection and recycling of the WEEE. The Directive on WEEE (Directive 2002/96/EC), that entered into force in February 2003, provided for the creation of collection schemes where costumers return their WEEE free of charge. There was a revision in 2008, and the new WEEE Directive 2012/19/EU entered in force on August 2012 and effective on February 2014. This has assigned producers the responsibility for the financing and collection of End-Of-Life electronics.

On the other hand, the Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS Directive 2002/95/EC) entered in force in February 2003. It requires heavy metals such as lead, mercury, cadmium and hexavalent chromium and flame retardants such as polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE) to be substituted by safer alternatives. It was also revised in 2008, and the RoHS recast Directive 2011/65/EU became effective on January 2013 (http://ec.europa.eu/environment/waste/weee/index_en.htm).

On February 2013, the Commission requested the development of European standards for the treatment of WEEE. They include the following; marking of electrical and electronic equipment, the collection, logistic and treatment requirements for end-of-life household's appliances containing volatile fluorocarbons or volatile hydrocarbons, and the collection, logistics and treatment requirements for WEEE.

In September 2014, 25 U.S. states and 8 Canadian provinces had implemented systems or approved legislation creating electronics recycling systems. They also have active legislation in some countries in Africa, Asia and South America. They are clearly divided into the ones that cover all EEE products, as the EU Directive, and the ones that focused the policy only in some products.

Some alternatives are organised from the population, such as repair cafes and social workshops where people can share their knowledge and they repair electronic devises for free or cheaper than in stores (Millor que nou a Barcelona or ReEconomy in Scotland).

Official statistics show that most EU countries collect less than 50% of total EEE put on the market, with collection rates falling in smaller products. Moreover the system has many leaks to countries where sub-standard treatments are used. A sound WEEE collection system should:

- Prevent toxic materials from entering landfills or being incinerated
- Recover metals and plastics from e-waste, thereby avoiding the environmental impacts associated with producing virgin materials
- Ensure that e-waste is processed in an environmentally- and socially-responsible manner
- Ability to identify re-usable products, refurbish them and resell them

Proposal

Deposit:
Some proposals to set a deposit on certain EEE streams have appeared in the recent years both from advisory bodies (such as the Council for Sustainable Development of Germany) or civil society (Universities and consultancies). Eunomia's Chris Sherrington defends a deposit on small EEE in order to increase the collecting rate. According to his proposal the refund will be depending on the state of the article; The entire deposit would be returned if the item can be reuses or repaired and only a proportion if the item is suitable only for recycling. As well as incentivising the management of WEEE in such a way as to maintain the highest possible value, such a policy instrument would likely prevent the continued accumulation of redundant electrical and electronic items in people's homes, which at present increases the relative demand for primary resource extraction (http://www.isonomia.co.uk/?p=4381).

For some EEE the setting of a deposit would make sense in order to encourage high collection rates. The amount of the deposit could be set depending on the amount and weight of the most valuable components –motherboard, memory modules... –. Candidates to have deposit are notebooks, smart phones, cell phones or tablets, products that are portable and can be easily disposed of in improper waste collection systems. As higher collection rates could be also achieved by a refundable tax, further research needs to be done on elucidating if a refundable tax may be more recommendable than a deposit.

Countries

More information

Return to vendor: http://www.isonomia.co.uk/?p=4381

Proposals for existing EPR (legal initiatives)

Product	**Mobile phones**					
Consumption (EU-28)	1.158.209	tons				
Collection rate (EU-28)	575.170	tons				
Recycling rate (EU-28)	29%					
kind of existing or proposed instrument	Leasing		**Deposit-refund**	Refundable tax scheme	**Buy back**	Take back
Market	**B2B**		**B2C**			
Start of the chain	retailer		**producer**			
Management option	Recycle		**Reuse**			
Reason to implement an incentive - economic reasons	**valuable material**		**strategic material**	costly separation		
Technical reasons	no existing recyclable process		no existing collection	difficult to separate at sorting facility		
Environmental reasons	littering risk (earth)		littering risk (sea)	toxic product or contents		

Environmental background

Mobile phones contain different plastics that may be treated with flame retardants. Around 17 different metals are used in a phone, some of them hazardous to the environment and human health. Besides the environmental degradation related to (rare metals) mining and oil extraction and usage much of the environmental and health impact is linked to low tech recycling in developing countries. These may include burning (emits PAHs, PCDD/Fs etc) and dissolution in strong acids followed by inappropriate disposal of residues onto the soil or into waterways. "Contamination associated with E-waste has already caused considerable environmental degradation in poor countries and negatively affected the health of the people who live there."(Robinson, 2009) Contamination can enter aquatic systems and negatively effect animal and plants species. Many of the pollutants are bioaccumulative and can make their way up to the humans via the food chain.

While low-tech recycling is very problematic another problem is the accumulation of stockpiles of mobile phones in people's homes which prevents recycling and efforts to reduce raw materials consumption (and associated negative impacts). Bitkom's recent study of German consumer behaviour revealed that up to 30% of used mobiles – an estimated 83 million devices in total - are 'stowed away in drawers'[5]. Experts called for a deposit-refund system for mobile phones: "Without a cell phone deposit less than 5 percent of the incidental all handys find their way to recycling."[3] The German Advisory Council on the Environment (SRU) stated in a 2012 report « the introduction of a mandatory deposit and refund system for mobile phones and computers would improve collection rates for used electronic equipment and reduce raw materials consumption». However BITKOM claimes that Implementing a deposit scheme for such products would be 'more costly and have little added benefit' compared with current take-back systems run on behalf of producers.

One effective system for high-quality collection could consist in deposit systems for electrical equipment, especially high-tech devices. The SRU takes the view that initially it would be worthwhile introducing such systems for mobile phones and computers. The last ten years have seen a rapid rise in the use of these two products. Statistics indicate that every 100 households in Germany

Depiction of existing systems

Apart from the general take back schemes that the different PRO operate in European countries, many buy back programs in European countries to collect mobile phones and other electronic devices. Prices given depend on the model returned and money can be paid directly to users or discounted after the purchase of a new product.

An example of a mobile phone operator is O2 that in the UK offers **a buy back** program where the money is credited to next month bill. This and similar mobile phone operators scheme might be an example of individual producer responsibility where both financial and physical responsibility lies in the hands of the company. In Bulgaria some collection companies offers vouchers in exchange of e-waste, while some mobile operators give discounts on new purchased phones if old ones are brought back.

Another example is the European telecommunications retailer "The Phone House" that offers a buy back program that includes damaged mobile phones.

Similarly, buy back or exchange systems can be found in most European countries even without the need of selling new phones. For instance, in France «Magic recycle» and in many European countries Zonzoo offer online systems.

In all cases, the return rate is unknown.

Proposal

Deposit
The system could be modelled on the deposit system for car batteries that has been in place since 1998. The model has proved successful: the present recovery rate is close on 100 percent (UBA 2011). A deposit on mobile phones or computers could be very similar: On purchase of a mobile phone, a deposit is charged which is refunded when the device is returned. Responsibility for running the deposit system would rest with mobile phone providers, computer dealers and electrical dealers. Instead of paying the deposit on a new mobile phone, the consumer could give back an old mobile phone. (SRU 2012)

Countries

Many European countries

More information

O2 https://www.o2recycle.co.uk/terms.aspx

German Advisory Council on the Environment – SRU (2012), ENVIRONMENTAL REPORT 2012: Chapter 2: Metallic and mineral resources, http://www.umweltrat.de/SharedDocs/Downloads/EN/01_Environmental_Reports/2012_06_Environmental_Report_Chapter_02.pdf

Robinson, B. H. (2009). E-waste: An assessment of global production and environmental impacts. Science of The Total Environment, 408(2), 183–191. https://doi.org/10.1016/j.scitotenv.2009.09.044

[3] http://m.bild.de/politik/inland/umweltschutz/experten-fordern-pfand-fuer-handys-34640444.bildMobile.html

[4] https://www.magicrecycle.com/

[5] http://www.recyclinginternational.com/recycling-news/6330/e-waste-and-batteries/germany/germany-debates-post-growth-society-issue

Data from http://ec.europa.eu/eurostat/statistics-explained/images/6/60/WEEE_statistics_2015.xlsx

Proposals for existing EPR (legal initiatives)

Product	**Beverage packaging**				
Consumption	N/A				
Collection rate (EU-25)	N/A				
Recycling rate (EU-25)	N/A				
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme	Buy back	Take back
Market	**B2B**	**B2C**			
Start of the chain	retailer	**producer**			
Management option	Recycle	**Reuse**			
Reason to implement an incentive - economic reasons	**valuable material**	strategic material	costly separation		
Technical reasons	no existing recyclable process	no existing collection	difficult to separate at sorting facility		
Environmental reasons	**littering risk (earth)**	**littering risk (sea)**	toxic product or contents		

Proposals for existing EPR (legal initiatives)

Depiction of existing systems

A & R Thwaites & Co in Dublin, Ireland, announced in 1799 the provision of artificial “soda water” and that they paid 2 shillings a dozen for returned bottles. “Schweppes” that also was in the business of artificially made mineral waters, had a similar recycling policy about 1800, without any legislation. Scottish bottled beverage companies also voluntarily introduced such a scheme to encourage the return of their bottles for reuse. In Sweden, a standard system for deposits on bottles and recycling was established in 1884, eventually by law.

Deposit systems for one-way bottles date back to the late sixties, when British Columbia’s legislated deposit-return system, enacted in 1970, is the oldest such program in North America. In Europe, the popular demand led to a deposit on aluminium cans being intriduced in 1984 to reduce littering in Sweden after the construction of a can production facility.

Deposits, set through government legislation, are charged when products are purchased. They are returned in full when consumer brings back the empty container for recycling. This helps to increase the reuse and the recycling of packaging products. Moreover, it prevents littering and encourage the producers or distributors concerned to have recourse to reusable packaging.

In order to achieve high reuse and recycling rates, the industry has introduced voluntary deposit systems on reusable packaging and some Member States of the European Economic Area (EEA) have implemented mandatory deposit refund systems on one-way beverage packaging. These are very successful in reducing littering and the rate of recycling it is higher.

To comply with the requirements of the Packaging Directive, the Members States of the EEA have introduced systems for the separate collection of packaging waste as a basis for the reuse of packaging products, the recycling and the recovery of the energy. In general, national reuse systems work better in hotels, restaurants and catering sector.

Proposal

Deposit expansion
The introduction of a mandatory deposit refund system for the whole EU/EEA would be the solution to avoid the fragmentation of the market and minimise possible barriers to free trade.

A proposal for deposit on one-way beverage packaging should include at least water, beer, juices and soft drinks and, in order not to distort packaging market, all the major packaging materials should be included –metal, glass, plastic, cartons and, possibly stand-up pouches.

To reinforce protection for refillables a tax on one-way packaging could also be considered as the one existing in Norway.

Countries

Up to 40 countries or states, including Australia, Belgium, Canada, Croatia, Czech Republic, Denmark, Estonia, Fiji, Finland, Germany, Hungary, Iceland, Israel, Lithuania, Netherlands, New Zealand, Norway, Slovenia, Sweden, Switzerland, United Kingdom, United States...

More information

Deposit systems for one-way beverage containers: a global overview: http://www.cmconsultinginc.com/wp-content/uploads/2017/05/BOOK-Deposit-Global-24May2017-for-Website.pdf

Proposals for existing EPR (legal initiatives)

Product	**Crisp/Snack packets**				
Consumption (EU-28)	15.012.342	tons			
Collection rate (EU-28)	0	tons			
Recycling rate (EU-28)	36%				
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme	Buy back	Take back
Market	B2B	**B2C**			
Start of the chain	Retailer	**Producer**			
Management option	**Recycle**	Reuse			
Reason to implement an incentive - economic reasons	Valuable material	Externalised costs	Costly separation		
Technical reasons	**No existing process for recycling**	No existing collection	Difficult to separate at sorting facility		
Reason to implement an incentive	**Littering risk (earth)**	**Littering risk (sea)**	Toxic product or contents		

Environmental background

Crisp packets and similar packaging for snacks are usually a composite packaging made of plastic foil and a metallic layer. Currently they cannot be recycled and are landfilled, or burnt releasing toxic emissions. Crisp packets can also be made of plastic foil (PP), that can potentially be recylced. Due to their very low weight they could be blown to long distances and litter the environment.

When littered in the sea they can cause suffocation of some marine life (i.e. turtles). Packets degradation in the environment would take decades if not more and would result in small pieces.

Crisp packet are cosidered as one type of litter among others and are more visible due to their vollume. Some studies suggest that litter in general besides direct costs – for local authorities or WM companies may have quite high indirect costs (externalities) far outweighting the direct costs. Some of these costs could be poor mental health, increase the likelihood of crime, and reduce property values. http://www.wrap.org.uk/sites/files/wrap/Indirect%20Costs%20of%20Litter%20-%20Final%20Report.pdf)

Depiction of existing systems

So far no functional deposit-refund systems exist for such packaging.

The collection of this items in the EU is done mainly through Packaging recovery operators (i.e. collective schemes of producers who pay fee for collection and treatment based on the amount of packaging released on the market) but not all existing schemes accept this material. For instance, FostPlus in Belgium does not accept this packaging and asks users to put it on the mixed waste bag which is the same case in France with Ecoemballage.

There is an alternative approach under development in the Netheelands. Dutch cabinet is "developing a set of tools to phase out certain environmentally harmful products (or components of products), especially those for which good alternatives are already available. Products the Cabinet is considering in this respect include superfluous or non-recyclable packaging (multilayer packaging, such as for crisps and soup)." This is part of a wide 2016 programme called A Circular Economy in the Netherlands by 2050.
https://www.government.nl/documents/policy-notes/2016/09/14/a-circular-economy-in-the-netherlands-by-2050

Proposals for existing EPR (legal initiatives)

Product	**Food boxes**					
Consumption (EU)	7.500.000.000	units				
Collection rate	N/A	tons				
Recycling rate						
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme		Buy back	Take back
Market	**B2B**	**B2C**				
Start of the chain	Retailer	**Producer**				
Management option	Recycle	**Reuse**				
Reason to implement an incentive - economic reasons	**Valuable material**	Strategic material	Costly collection/separation			
Technical reasons	No existing recycling process	No existing collection	Difficult to separate at sorting facility			
Environmental reasons	Littering risk (earth)	Littering risk (sea)	Toxic product or contents			

Environmental background

The production and distribution of fresh fruit and vegetables in Europe requires the use of 7.500 million transport units. Around 4.400 milion units are reusable crates and IFCO and EUROPOOL are the main players in this market. Disposable boxes are mainly made of cardboard, wood or even plastic and many producers are fighting for this market.

An LCA conducted by Fraunhofer Institute shows that the plastic crates and wooden boxes show almost similar results in the "Global Warming" Category. The wooden boxes perform best in "Ozone Depletion". For all other impact categories, ("Eutrophication", "Summer Smog" and "Acidification"), the plastic boxes show the lowest impacts whereas cardboard boxes have the highest impacts for all impact categories. The multi-way system has advantages over the one-way systems in terms of the rate of lethal accidents and its economic efficiency (low costs).
Furthermore, the environmental assessment indicates that the multi-way plastic crates system becomes even more environmentally advantageous with an increasing lifetime, since the expenditure for production of the crates is distributed over a longer service life and thereby over a higher transportation capacity.

Reusable crates for transporting fruit and vegetables are more robust than disposable ones. Another study carried out also by the Fraunhofer Institute reached the conclusion that breakage rates for cardboard boxes (4.2%) are 35 times higher than for reusable crates (0.12%). By using reusable crates food losses are reduced in the transport phase.

Depiction of existing systems

Reusable crates operate normally as a pool system. This system means that crates or boxes are not exclusive of the client but that may be shared by different clients of the pool operator.

To minimise losses a deposit is set on every item that is contracted. On top of this, a per-use fee is paid every time the operator delivers clean boxes to the client (the producer). Amounts, costs, and frequencies are agreed within the contract with the operator of the system.

Normally, the pool system transports the crates to the producer, where fresh product is packaged directly in the crates at the time of harvesting for transportation to the retailer. Responsibility for the trays (at deposit value) is then passed to the retailer. The crates can be used for product presentation in the shop. After use, the system operator or the producers own carrier brings the empty crates back to the service centre.

Responsibility for the crates then passes back to pool operator and the retailer is credited for returned crates.

Finaly, all crates are checked for defects and washed, so they are hygienically clean again for the next use in the fresh supply chain.

Proposal

Deposit
As a means to to set a level playground for disposable and reusable alternatives to compete a deposit on disposable crates is recommended. This proposal would also make such products to virtually disappear from the municipal waste stream.

Countries

All European countries

More information

Productos frescos de caja en caja: http://www.mercasa.es/files/multimedios/1396995502_DISTRIBUCION_Y_CONSUMO_131productosfrescos.pdf

Depiction of existing systems

The Directive's overarching objective – the availability of collection networks for all portable batteries – has been implemented in all member states. However, collection rates are far from being optimal and many countries will not meet 2016 targets.

Acording to the article 9 of the 2006/66/EC Directive, "member States may use economic instruments to promote the collection of waste batteries and accumulators or to promote the use of batteries and accumulators containing less polluting substances".

The setting up of a deposit on one-way beverage containers has helped rising collection rates from around 40% to more than 90%. Although consumer behaviour and awareness may be different, setting a deposit on certain one-way portable batteries –and optionally on all portable batteries– may help address different issues that distort current collection schemes:
- Not reported as put on the market..
- Stagnating collection rates.
- Avoiding cherry picking by EPR that may focus on easier to collect batteries.
- Distinction between portable and industrial batteries.
- Identifying waste batteries available for collection.
- Requiring recycling efficiencies of portable batteries to be reported

It is very important to take into account the nature of the batteries and its market and a deposit should be designed so that importing companies, manufacturers and importers of electrical and electronic equipment do not bear much burden from the deposit central organitsation.

As primary batteries have an average life span of 2.5 to 3.5 years and rechargeable portable batteries can last much more it is important to set a deposit that remains meaningful to the consumer when the battery reaches the end of its useful life and a periodical revision of the deposit amounts may be necessary.

In order to avoid relying on the consumer's ability to retain the purchase receipt as "evidence of deposit" a "deposit mark" could be incorporated in the battery itself stating on which countries the battery bears a deposit in order to minimise barriers to free trade within the European Community.

As in most European countries batteries management is done through an existing EPR scheme, the management of the deposit should be done incorporating such PRO and never unilaterally without the involvement of the EPR schemes. It is important that the expertise of these schemes is taken into account to when setting economic instruments.

Proposal

Deposit
Collection rates and control of products put on the market are the weakest link in current EPR implementation of batteries. Plus, rechargeable batteries still have a very small share of the market. To solve this problem a deposit scheme could be set up on disposable batteries, specially on the smaller ones (below AA) and with mercury content.

Refundable tax:
Alternatively, a (partially) refundable tax could be used instead of a deposit

Countries

None

More information

Proposals for existing EPR (legal initiatives)

Product	**Portable batteries**				
Consumption (EEA)	214.000	tons			
Collection rate (EEA, 2014)	85.600	tons			
Recycling rate (EEA)	NA				
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme	Buy back	Take back
Market	**B2B**	**B2C**			
Start of the chain	Retailer	**Producer**			
Management option	Recycle	**Reuse**			
Reason to implement an incentive - economic reasons	**Valuable material**	Strategic material	Costly separation		
Technical reasons	No existing process for recycling	No existing collection	Difficult to separate at sorting facility		
Environmental reasons	**Littering risk (earth)**	**Littering risk (sea)**	**Toxic product or contents**		

Environmental background

The collection of portable primary and rechargeable batteries in Europe is mandated by Directive 2006/66/EC which requires Member States to achieve a collection rate of 25% in 2012 and 45% in 2016.

On the basis of mostly unofficial data (Perchards, 2015), around 214,000 tonnes or an estimated 10.200 million portable batteries were reported to have been placed on the market of the EEA plus Switzerland in 2014, while only around 85,000 tonnes of waste portable batteries were reported as collected. This corresponds to a collection rate on a current year basis of 40%, 5 points short of the average European target. Moreover, an extrapolation of the collection rates from 2012 to 2014 suggests around 20 of the 30 EEA area are unlikely to meet the 45% collection rate in 2016.

The fact that not all batteries are properly collected and recycled at the end of their life, increases the risk of releasing hazardous substances and constitutes a waste of resources. This situation is highlighted by the fact that of the average 19 units per capita put in the market, only 3,4 are collected, or a mere 18%. The difference of this figure with that ofthe per weight collection rate raises concern that heavier and larger batteries have collection rates while smaller batteries –e.g. those using Mercury or Cadmium – may end up disposed in the environment.

Many of the components of these batteries and accumulators could be recycled, avoiding the release of hazardous substances to the environment and, in addition, providing valuable materials to important products and production processes in Europe.

Proposals for existing EPR (legal initiatives)

Depiction of existing systems

The Directive's overarching objective – the availability of collection networks for all portable batteries – has been implemented in all member states. However, collection rates are far from being optimal and many countries will not meet 2016 targets.

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- Not reported as put on the market..
- Stagnating collection rates.
- Avoiding cherry picking by EPR that may focus on easier to collect batteries.
- Distinction between portable and industrial batteries.
- Identifying waste batteries available for collection.
- Requiring recycling efficiencies of portable batteries to be reported1

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In order to avoid relying on the consumer's ability to retain the purchase receipt as "evidence of deposit" a "deposit mark" could be incorporated in the battery itself stating on which countries the battery bears a deposit in order to minimise barriers to free trade within the European Community.

As in most European countries batteries management is done through an existing EPR scheme, the management of the deposit should be done incorporating such PRO and never unilaterally without the involvement of the EPR schemes. It is important that the expertise of these schemes is taken into account to when setting economic instruments.

Proposal

Deposit
Collection rates and control of products put on the market are the weakest link in current EPR implementation of batteries. Plus, rechargeable batteries still have a very small share of the market. To solve this problem a deposit scheme could be set up on disposable batteries, specially on the smaller ones (below AA) and with mercury content.

Refundable tax:
Alternatively, a (partially) refundable tax could be used instead of a deposit

Countries

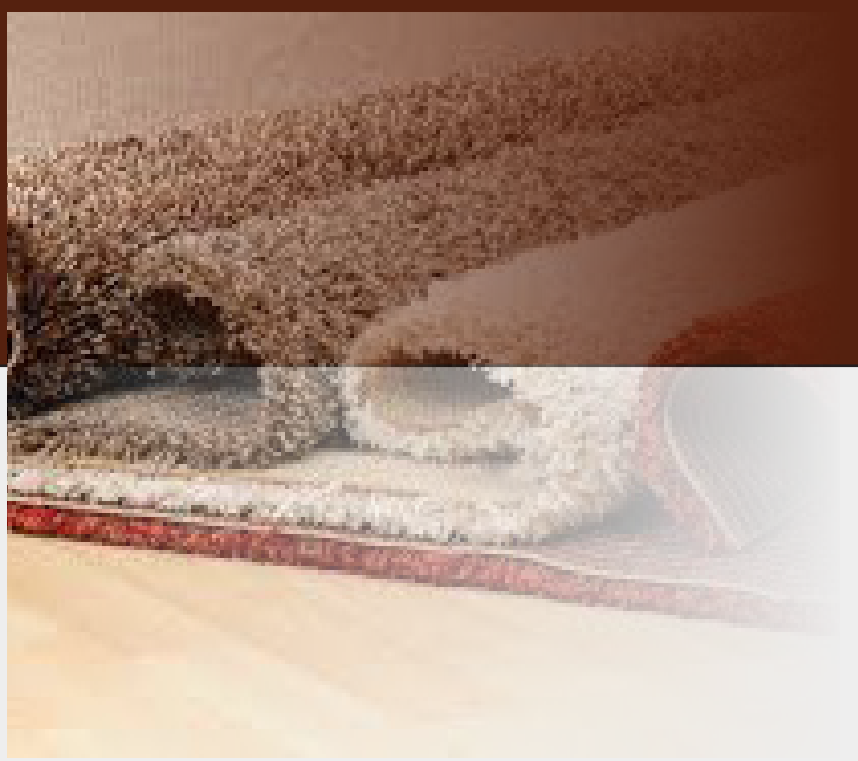
None

More information

Fundació prevenció residus i consum

4.4 New proposals for non-existing EPR at European level

Proposals for non existing EPR (legal initiatives)



Product	**Carpet**				
Consumption (EU 2015)	560.000.000	sqm			
Collection rate					
Recycling rate					
kind of existing or proposed instrument	**Leasing**	Deposit-refund	**Refundable tax scheme**	Buy back	Take back
Market	**B2B**	**B2C**			
Start of the chain	retailer	**producer**			
Management option	Recycle	**Reuse**			
Reason to implement an incentive - economic reasons	**valuable material**	strategic material	**costly separation**		
Technical reasons	no existing recyclable process	**no existing collection**	difficult to separate at sorting facility		
Environmental reasons	littering risk (earth)	littering risk (sea)	toxic product or contents		

Environmental background

Around 1% of municipal solid waste in Europe is carpet waste.

In 2016, 560 million square metres of carpets were sold in the EU, which makes it the second biggest market, after the United States, with Germany and the United Kingdom as the main markets with more than half of the total carpet consumption.

Carpet presents difficulties for end-of-life management: it is bulky and expensive to transport. Millions of square metres of worn-out carpet are thrown away every year, often burned or dumped at landfill sites, leading to the destruction of valuable raw materials. Both the burning and the deposition at the landfills are harmful for the environment, there is emission of toxics products and in the landfill there exists a space problem. The most recent data show that an average of 1.6 million tons of used carpets end up in landfills (70%) or incinerators (30%). Only a small percentage of carpet is currently recycled in the EU. The exact numbers are unknown, but investigations by Ecostorm (2017) have revealed even progressive compnies, like Interface and Desso, take back at most 3 percent of their carpet for recycling.

Without the development of alternative systems to reuse and recycle carpet wastes, production of RDF from old carpets is currently the only alternative to landfill. Nevertheless, carpet composition comprises a number of valuable raw materials, such as polymers (PA-6, PA-6,6, PET, PP), natural fibres (wool), and inorganic fillers ($CaCO_3$ or chalk).

Curently no collection provision for this waste stream is implemented thourgh EPR.

The general life span of a carpet is around 7 to 20 years, depending on the intensity of use and other factors, such as damage, changes in taste or changes in the facility's owner or usage purpose.

Carpet recycling reduces the extraction of raw material, not only for carpet production, also for other products and electricity production.

Depiction of existing systems

EUROPE

Only a small percentage of carpet is currently recycled in the EU. The exact numbers are unknown, but investigations by Ecostorm (2017) have revealed even progressive companies, like Interface and Desso, take back at most 3 percent of their carpet for recycling (DUH, 2017).

The United Kingdom lacks a local facility for processing polymer fibers and their carpet waste mostly consists of polypropylene-based fibers, which both act to limit the capacity for recycling recovered carpet. Of the 21.4% of the carpet waste that is collected, 58% is used as fuel in cement kilns, and 34% is downcycled for use in equestrian surfaces. Only a remaining 8% was recycled or reused.

Carpets have been banned from landfill in Germany since 2005. The nylon-6 recycling plant that operated in Germany from 2000-2002, it closed due to a lack of raw materials. Without any major facilities for polymer recovery operating, much of the carpet waste in the EU is either burned in cement kilns or incinerated. Desso, a Netherlands-based carpet manufacturer, is now piloting its Refinity recycling process for cradle-to-cradle reuse of carpet tiles.

Desso has developed a take back programme and leasing system to drastically increase collection of post-consumer carpet in Europe. It committed itself to 16,000 tonnes of reclaimed material as of 2013, under the LIFE project, for which it received EU funding, and has set a target of 20,500 tonnes of collected material for recycling in its 2020 Roadmap. However, in 2015, the company only collected 1,342 tonnes of used carpet, a meagre 3 percent of its total carpet sales (Desso, 2016). In 2014, Desso started a leasing scheme for consumers, in which it remains the owner of the carpet, and retains control over maintenance and collection of post-consumer carpet. Despite these efforts, the reclamation rates are still very low and Desso seems to be lagging behind its own target (DUH, 2017).

Interface, an American company, is the largest manufacturer of modular carpet (also known as carpet tiles) worldwide. It sells around 12 million m^2 or 56,000 tonnes of its carpet in Europe, worth $262 million, about a quarter of the company's business and has also made some advances towards sustainable carpet waste management. Nevertheless, a report by Ecostorm Investigation (2017) in Germany, France and Belgium revealed that Interface currently only takes back about 1.5 percent of its European sales for recycling; they call this ReEntry®2.0. Since there are hardly any other recycling facilities in Europe that can treat post-consumer carpet for recycling, it can be assumed that presently the other 98.5% of Interface's carpet almost always ends up on landfills and in incinerators (DUH, 2017).

UNITED STATES

Mostly of the agreements for a take back system about carpets are made for companies and not the government. A lot of producers in the US are acknowledging responsibility for their products at the post-consumer stage and are implementing take-back and recycling programs. In fact, players at different stages in the product chain are voluntarily taking responsibility and are actually competing in developing take-back programs and new recycling technologies.

In 2010, California passed the first law (AB 2398, J. Perez) in the world to place responsibility for carpet waste management on the producers. It charges consumers a fee (25 cents per square yard starting in 2017) which funds a producer-run collection and waste management system. The main purpose of this law was to ensure carpet waste is diverted from landfill, with a preference for reuse and recycling over incineration as alternative means of disposal.
The resulting Carpet America Recovery Effort (CARE) stewardship program has resulted in more than doubling the waste sent to incinerators, with almost no increase in recycling. The industry set a goal of a 16% recycling rate for carpet in California by 2016 however it has never met that goal and in 2014 and 2015, the recycling rate fell in California from 12% to 10%. In 2014-2015, the industry reported decreases in collection, recycled output, the overall recycling rate, and the diversion rate. Meanwhile, disposal to landfill increased (CARE 2015).
It should be noted that, despite flaws in the design of this particular EPR and the industry's effort to undermine it– the recycling rates of carpet are around 10 percent there, roughly 3 times as high as in Europe.

In 1999 Minnesota launched its Product Stewardship Initiative and identified carpet as one of three priority waste streams that need to be addressed.

Proposal

The worrying situation of carpet management makes it necessary that policy-makers implement measures such as Extended Producer Responsibility (EPR) schemes and obligatory take-back by producers. These mesures should be designed so that the following targets should are met (DUH, 2017):
- carpets need to be designed with reuse and full recyclability in mind;
- Infrastructure between manufacturers, retailers and municipalities for separate collection of carpet waste to prevent contamination and enable easier reuse and recycling;
- Recycling facilities that provide high quality recycling of carpet material back to carpet material, in a closed-loop system

In order to guarantee return of used carpets, a tax could be set on producers and a refund implemented according to the amount of carpet being recycled.

Countries

US, UK, Australia, France, Germany, Belgium, the Netherlands, Luxembourg...

More information

Carpet Take-Back: EPR American Style: http://infohouse.p2ric.org/ref/14/13823.htm

http://www.desso.com/

Sustainable closed loop system for Recycling of Carpet Materials (RECAM): http://cordis.europa.eu/result/rcn/23590_en.html

Proposals for non existing EPR (legal initiatives)

Furniture

Product					
Consumption (EU-25)		tons			
Collection rate (EU)		tons			
Recycling rate (EU)					
kind of existing or proposed instrument	**Leasing**	Deposit-refund	Refundable tax scheme	**Buy back**	**Take back**
Market	**B2B**	**B2C**			
Start of the chain	retailer	**producer**			
Management option	Recycle	**Reuse**			
Reason to implement an incentive - economic reasons	**valuable material**	strategic material	**costly separation**		
Technical reasons	no existing recyclable process	no existing collection	difficult to separate at sorting facility		
Environmental reasons	**littering risk (earth)**	littering risk (sea)	toxic product or contents		

Environmental background

EU furniture waste accounts for more than 4% of the total municipal solid waste, of which 80-90% is incinerated or dumped in landfills, with only 10% recycled (CREM, 2014).

According to the Swedish furniture industry the average furniture product consists of 70% wood (or wood-based material), 15w% padding materials (mainly polyurethane and polyester foam), 10w% metals and 5w% other materials (plastics, textiles, glass, etc.). That means that there is a huge pressure and when wood coming from improperly managed forest is used, deforestationnt is an important impact. If it is possible to reuse or recycle this material from used furniture, the demand of raw material would be lower. It is the same for a lot of other materials that their extraction is not sustainable.

The UK-based Furniture Re-use Network (FRN) charity counts that with the donation and reused of furniture it is saved over 126,500 tons of CO2, divert 118,350 tons of waste from landfill and helped around 1.5 million low income households every year in the UK (http://www.frn.org.uk/).
Reusing a table can save approximately 20 kg CO_2 and reusing a sofa saves over 54kg CO2-eq.

Depiction of existing systems

TRADITIONAL REUSE
In the case of households, furniture is sometimes reused. Different options exist to reuse the furniture, mainly selling it in thrift stores or donating it to charity organisations. In parallel, most most cities offer a periodic bulky furniture collection service or drop-off at recycling yards. Although there may be reusable furniture, collection by municipal services ends in breaking the piece of furniture and making it more difficult to repair, renovate and reuse.

BUY BACK
In recent times, some companies have their own projects to increase collection rate and reuse:

- In the case of household furniture, in some outlets Ikea has a buy back program for old furniture and then selling it as a second-hand product.

- In the case of office furniture Steelcase, a designer company, offers options for reusing and recycling. With the help of a consultant the client can set a market price for the furniture and sell it, or receive credit to offset part of the cost of buying new furniture. Furthermore, they connect people who needs free furniture with the ones that don't want them anymore to reuse it, and identifies materials in used furniture that can be recycled.

LEASING
While this is a very rare option for household furniture, companies quite often lease or rent their furniture. In this way, the ownership of the product remains in the hands f the supplier and it has incentive to promote reuse, repair, upgrade and other options. There are many companies that offer this option; JMT, the largest rental furniture supplier in Europe, Furniture Leasing corporation, in Europe and US, In-lease...

EPR
Since 2012 France has the only national furniture EPR scheme in the world,known as Eco-mobilier (domestic furniture) and Valdelia (professional furniture). It was set up in response to the significant amounts of furniture waste which were entering landfill (around 2 million tonnes), a lot of which still had reuse potential. The law sets a re-use and recycling target of 45% for waste household furniture and 75% reuse and recycling rate for workplace furniture. In addition it sets a separate reuse target in the form of increasing the amount of used furniture put back on the market by 50% from a baseline situation by 2017 (RREUSE, 2013).

Proposal

Deposit is difficult to apply to furniture but some other approaches to incentivise better collection and management of end-of-life furniture can be implemented, including incentivised return, leasing and take-back models. Eunomia has been commissioned by the European Environmental Bureau to research the effects of the circular economy and identify key interventions and policy levels to accelerate circular economy in the furniture sector.

We recommend waiting for Eunomia to come with a comprehensive study and proposals including economic incentives. In any case, durability and potential for reuse should be the main areas of concern and further research, if needed.

The key point about any proposal is that it grants access to collection points firstly to social enterprises in order to carry out reuse activities and any systems should guarantee the quality of collected furniture for the reuse.

Countries

France

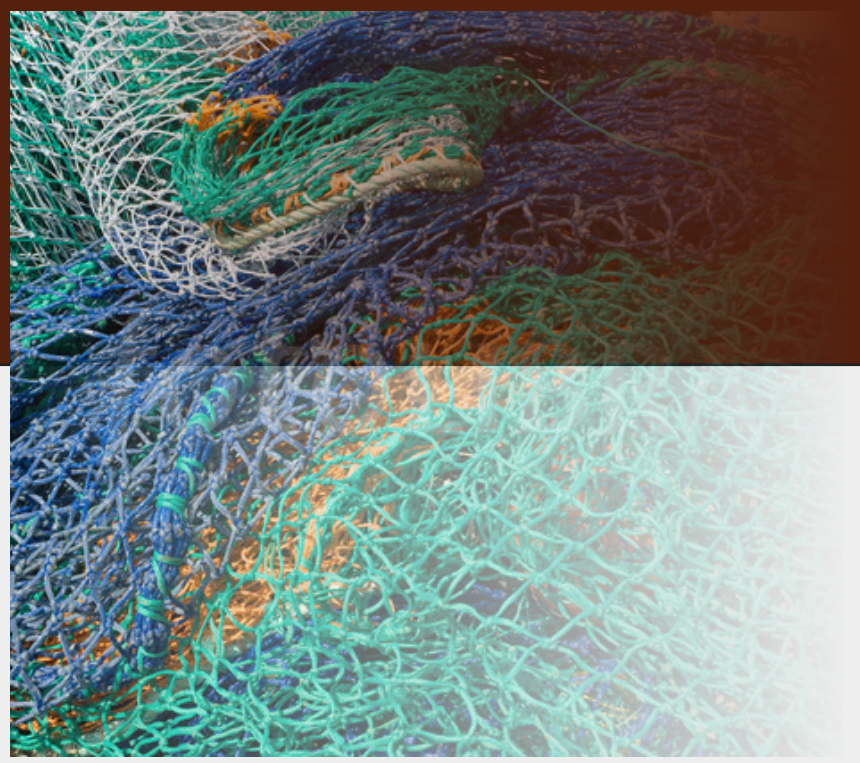
More information

Furniture Reuse Network: http://www.frn.org.uk/

Benefits of Reuse Case Study: Domestic Furniture: http://www.wrap.org.uk/sites/files/wrap/Domestic%20Furniture%20chapter_final.pdf

Extended Producer Responsibility and the role of reuse activities: Opportunities for a resource efficient, socially inclusive waste management system: http://www.rreuse.org/wp-content/uploads/EPR_and_product_reuse.pdf

Proposals for non existing EPR (legal initiatives)



Fishing nets

Product			
Consumption	N/A	tons per year	
Collection rate	N/A	pounds	
Recycling rate	N/A	tons	
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme
			Buy back Take back
Market	**B2B**	B2C	
Start of the chain	retailer	**Producer**	
Management option	Recycle	**Reuse**	
Reason to implement an incentive - economic reasons	**valuable material**	strategic material	costly separation
Technical reasons	no existing recyclable process	no existing collection	difficult to separate at sorting facility
Environmental reasons	littering risk (earth)	**littering risk (sea)**	toxic product or contents

Environmental background

Construction of fishing nets transitioned from natural, biodegradable materials such as cotton to plastic monofilament and vinyl-coated steel. This change made them more resistant, what is good to reuse them and reduce fuel consumption but it is also bad news for the environment since they take decades, even hundreds of years to decompose in water.

Fishing nets are made of various kinds of plastic fibres, what makes them harder to recycle. Luckily, nylon nets are easy to recycle and produce new materials from them.

Most old web gets dumped in community landfills, shortening landfill's useful life and adding expense to municipal operations. Ms. Sandrini, from Aquafil, noted that there are as many as 600,000 nets scattered across the world's seas. Abandoned, lost or otherwise discarded fishing gear (ALDFG) is a problem that is increasingly of concern. Various United Nations General Assembly resolutions now provide a mandate for, and indeed require, action to reduce ALDFG and marine debris in general. as follows. Despite some abandonment occurs, most gear is not deliberately discarded – the predominant source of ALDFG is through loss resulting from gear conflicts, loss in storms or strong currents.

The problem of these derelict fishing gear is that they impose a variety of harmful impacts, including; the ability to kill target and non-target organisms, including endangered and protected species. The organisms caught in the discarded fishing gear (DFG) die as result of starvation, predation or cannibalism. There is also a physical damage in the habitats such as coral reefs, and contribution to marine pollution. Lost or dropped nets can modify the seabed artificially as well as rocky reefs, altering the natural rigidity or hardness of reef, blocking crevices, causing abnormal scrubbing of the seabed, and entrapping fine sediment that suffocates plants and animals thereby affecting the complexity of microhabitats available for the biodiversity. Furthermore, the plastics decompose and get into the marine food web being eaten by marine species.

There are also some factors that have an economic negative impact for the fisheries, including costs of replacing lost gear, cost of buying new gear to comply with new regulations, and decreased populations of target organisms due to mortality in DFG.

Apart from the problem of ALDFG, the problem of end-of-life management also exists.

Proposals for non existing EPR (legal initiatives)

Depiction of existing systems

Multiple programs now exist to promote onshore collection, disposal and recycling of used gear. Improved relationships between industry, government and non-governmental organizations are also necessary to promote change and better management. One of the most important tool to handle this problem is through the regulatory framework; in 1973, it appears the prohibition of abandonment or dumping of fishing gear by the International Maritime Organization Convention for the Prevention of the Pollution from Ships (NOAA).
PROPOSAL - In result of new EU regulation about mesh size change, hundreds of tons of fishing nets are just useless, but there is no regulation describing how handle the fishing nets waste in an environmentally favourable way. That is why it is important to have regulations that cover all the faces of the problem.

EXISTING
In Denmark, Frandsen WSC, a Jutland based recycling company has invented a method to separate various types of plastic so they can be recycled. Nets are collected at the Harbours before they are driven to the recycling facility in Aalestrup by truck. The Harbour will have the responsibility to take care of all the nets and pay Frandsen recycling company to collect the nets, this is charged in the fishing boats fee for the Harbours services (BEK nr 1632 af 13/12/2006). Fishermen are not forced by rule to return the old fishing net, and there are no rules how to manage this waste problem. This lack of regulation is also responsible for intensification of the problem. The nets that are not going to be recycled are collected by local waste facilities and drove to the landfilling area. Before recycling the nets are put on a field so the organic waste is decomposed. In the recycling process; the nets are divided into smaller pieces by a shredding machine, different materials are separated in another machine and these are melted into small pellets which can be used for new products. The biggest negative impact in this process comes from the transportation and the electricity used. The materials more used are Polyethylene, Polyamide and Dyneema (new material) that are all recyclables.

In Catalonia, the government and the Barcelona University launched a campaign to collect lost nets from the coast of Montgrí. Other project was promoted in April 2015 by the government with other organizations to facilitate proper management of fishing nets once their useful life is over. They placed containers in all the harbours to deposit the old and damaged nets. These are transported to authorised manager's installation where the separation and classification is done, and the plastics pellets are send to the final manager. At the end, these materials are trat to develop new plastics products.

Healthy Sea Initiative is funded by the European Union and has taken more than 20 tons of discarded nets from North, Adriatic and Mediterranean Seas that will be recycled into ECONYL yarn. ECONYL® is a trademark of Aquafil S.p.A. The company's feedstock of choice is Nylon 6, from which they can transform 100% into new yarn from its six-step recycling and regeneration process. The end result is a material, caprolactam, different from the clothing made from recycled PET, because it can be reprocessed again and again.

Or Fishing for Energy, through which old nets are converted to electricity that can be used downstream.
Some companies in Alaska recycle the nets that they buy to the fishermen. They use to pay by pound of net and depending on the material and clearness of the nets. They usually prefer nylon nets than poly ones.

Proposal

Within the Circular Ocean project, a report on "Mechanisms to support the recycling/reuse of fishing gear and the prevention of gear becoming lost/abandoned at sea» explores economic incentives as a tool to promote reuse/recycling of discarded fishing gear, based on Eunomia's report «Study to support the development of measures to combat a range of marine litter sources". A summary of this proposals follows:

Deposit refund systems
A deposit refund system would require the consumer to pay a deposit upon the purchase of fishing gear. Once the gear reaches the end of life stage, the consumer could return the net and retrieve the deposit. A deposit refund scheme can incentivise fishermen to recycle the EOL nets/gear that would otherwise be burned, dumped or irresponsibly managed (Sherrington et al., 2016).

Buy back schemes
Such a program would offer a financial reward to those who return derelict gear found in the sea to the port facilities, being funded by public administrations. A recycling initiative could offer the same kind of reward system, but the source of money would be from the recycling market itself instead of taxes from local or regional governments.

In such respect, some experiencies have been done in Hawaii, where fishermen are asked to report derelict fishing nets at sea. A team of trained volunteers then go to the reported location and remove the fishing gear. Once the gear is professionally retrieved, the commercial fishermen are awarded cash according to the weights of the reported derelict nets or gear (Brink et al., 2009). A similar
program has been implemented in South Korea, but in this case, fishermen are responsible for reporting and retrieving the gear themselves.

For more a comprehensive evaluation of these two instruments, please check the above mentioned reports.

Countries

Denmark, Alaska, US, Slovenia, Spain

More information

End of Life Management of Fishing Nets: http://vbn.aau.dk/ws/files/32181213/Fishingnet_Normal.pdf

In the fishing industry, gear recycling is finally catching on: https://ensia.com/features/fishing-gear-recycling/

Abandoned, lost or otherwise discarded fishing gear http://www.fao.org/fileadmin/user_upload/newsroom/docs/Ghost_fishing_report.pdf

Mechanisms to support the recycling/reuse of fishing gear and the prevention of gear becoming lost/abandoned at sea http://www.circularocean.eu/wp-content/uploads/2017/06/Barrier-assessment_FINAL.pdf

Study to support the development of measures to combat a range of marine litter sources http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/pdf/MSFD%20Measures%20to%20Combat%20Marine%20Litter.pdf

Proposals for non existing EPR (legal initiatives)

Product	**Mattresses**					
Consumption (EU)	27.000.000	units				
Collection rate (EU-25)	N/A	tons				
Recycling rate (EU-25)	N/A					
kind of existing or proposed instrument	Leasing	**Deposit-refund**		**Refundable tax scheme**	Buy back	Take back
Market	**B2B**	**B2C**				
Start of the chain	Retailer	**producer**				
Management option	Recycle	**Reuse**				
Reason to implement an incentive - economic reasons	**valuable material**	strategic material		costly collection/ separation	littering costs	
Technical reasons	no existing process for recycling	no existing collection		difficult to separate at sorting facility		
Environmental reasons	littering risk (earth)	littering risk (sea)		toxic product or contents		
Environmental background	Although mattresses pose not much of an environmental hazard, many of them end up illegaly dumped, be it in natural spaces, vacant lots, backyards, abandoned buildings or the street itself. This creates costs for administrations to clean up and reduces property value. The main reason to this behaviour is that mattresses are bulky and difficult to handle and transport and they have little material value at the end of life. There are no studies regarding the costs generated by the mattresses as their collection cannot be done through mechanical means it's quite high.					

Depiction of system

TAKE-BACK
Both systems are based on EPR schemes and they differ in that the North-American schemes provide an incentive for each unit droped off at collection points whereas the French system does not. The system is set up by producers or importers of mattresses and funds collection through a collective scheme such as recovery operators.

France:
In the French case, a visible fee of 2,50 € (mattresses less than 1,2 m of width) or 5,00 € (more than 1,2 m of width) is paid to support the collection, sorting and treatment of the mattresses. Collection takes place at kerbside collection, municipality waste collection centers or retailers. Eco-mobilier funds the system that takes care of any other piece of furniture.

REFUNDABLE FEE:
From 2015 on three collection schemes have been set up in Connecticut, Rhode Island AND California. The program began May 1, 2016 and is managed by the Mattress Recycling Council (MRC), a non-profit organisation established by the mattress industry. It is funded through a visible recycling fee collected at retail from customers on each mattress and foundation sold in the state. These fees fund the collection and recycling of mattresses and foundations used and discarded.

The same funding mechanism is used in all states. The “recycling fee” is applied on all mattress sales and is not considered a tax, though a taxable line item. It applies also to on-line sales into affected states.
The fee determination process uses the following costs:
–Transportation and recycling
–Education and outreach
–State fees and auditing
–Staffing and overhead

The residents of the states where the program is in place may drop-off mattresses and box springs at a recycling facility, collection point or collection event. Residency restrictions and limits may apply and vary by site as well as the number of items allowed to be dropped off per visit and per time period (daily or yearly). A reimbursement of the fee is given per unit (in the case of Rhode Island) only at recycling facilities.

Paying a fee, at the point of purchase, into a fund to cover the eventual cost of collection and disposal, would not only significantly reduce future flytipping, but would also increase the viability of mattress recycling schemes (
Connecticut (Public Act 13-42 (2013)): 9 $ recycling fee. A 2 $ reimbursement, up to 4 per household per visit; 8 per year.
Rhode Island (Code 23-90 (2013)): 10 $ recycling fee. A $1 reimbursement is given per unit (up to 4 per household per visit; 8 per year) only at recycling facilities.
California (SB 254/1274 (2013 & 2014)): 10 $ recycling fee. A $3 reimbursement is given per unit (up to 5 units per day) only at recycling facilities.
In the absence of external funding, there would be a bit of a time delay as the scheme is implemented – with the first fees paid on new beds being redeemed several years down the line. However, once up and running it would be fully self-funding and able to continue in perpetuity, as long as fees are periodically reviewed.

Proposal

The promotion of proper collection and treatment of mattresses can be done either without EPR scheme through a refundable tax (i.e. a tax is set on every mattress put in the market and it is totally or partially returned when the mattress is returned at determined locations (including recycling yards and potentially retailers). Within an EPR scheme, a deposit would be a better incentive and the return of the old mattress would be done prefereably at retailers.

Countries

USA, FR

More information

Mattress Recycling Council: http://mattressrecyclingcouncil.org

Éco-mobilier: http://www.ecomobilier.fr

Guia de bones pràctiques: Diagnosi de la gestió dels matalassos fora d’ús http://residus.gencat.cat/web/.content/home/lagencia/publicacions/residus_municipals/guia-matalassos.pdf

Return to vendor: http://www.isonomia.co.uk/?p=4381

Proposals for non existing EPR (legal initiatives)

Product	**Coffee cups**				
Consumption (Germany)	2.800.000.000	units			
Collection rate	N/A	tons			
Recycling rate	N/A				
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme	Buy back	Take back
Market	B2B	**B2C**			
Start of the chain	**Retailer**	producer			
Management option	**Recycle**	**Reuse**			
Reason to implement an incentive - economic reasons	valuable material	strategic material	costly separation		
Technical reasons	**no existing process for recycling**	no existing collection	difficult to separate at sorting facility		
Environmental reasons	**littering risk (earth)**	**littering risk (sea)**	toxic product or contents		

Environmental background

There are no international figures regarding disposable coffee cup consumption but a recent study done in Germany estimates that nearly 3000 million units are used every year in this country. That means 35 units per inhabtitant and year witha total CO2-eq emissions of 83.000 Tons/year.

The average use-time of a disposable cup is short about 15 minutes and takeaway drinks often also include plastic lids and straws. All of this used cups are not recycled because they do not end in recycling facilites due to the lack of a clear recycling stream. Moreover, an important part of this disposable items end up littered in the streets or disposed of in trash bins.

Depiction of system

EXISTING EXPERIENCES

In Freiburg the FreiburgCup project has been in place for some months now. The customer pays a deposit of 1 euro for it's cup and once the empty cup is returned to a coffee shop the deposit is given back. As of March 2017, 64 coffee shops in Freiburg are using the reusable cup and they can be recognised by an sticker stating that they are part of the project.

Proposal

The easiest measure to promote reusable tax would be a simple ban on disposable. This could be done at local level and would be better done in parallel to the creation of a reusable cup scheme either public or privately managed.

Otherwise, the setting of a tax on disposable coffee cups would also help moving the use of one-way cups to refillable systems that could be set up at local or larger scales.

Countries

Germany

More information

Kaffeegenuss ohne Verpackungsmüll: http://www.abfallwirtschaft-freiburg.de/de/news/pfandbecher__neu.php

Depiction of system

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Countries

Germany

More information

Kaffeegenuss ohne Verpackungsmüll: http://www.abfallwirtschaft-freiburg.de/de/news/pfandbecher__neu.php

Proposals for non existing EPR (legal initiatives)

Product	**Textiles**				
Consumption (EU-27)	8.485.660	tons			
Collection rate (EU-25)	20% average (from 0% to 70%)	tons			
Recycling rate (EU-25)	50% recycle, 40% reuse, 10% disposed				
Kind of existing or proposed instrument	Leasing	**Deposit-refund**	**Refundable tax scheme**	Buy back	Take back
Market	**B2B**	**B2C**			
Start of the chain	Retailer	**producer**			
Management option	Recycle	**Reuse**			
Reason to implement an incentive - economic reasons	**valuable material**	strategic material	costly separation		
Technical reasons	no existing process for recycling	no existing collection	**difficult to separate at sorting facility**		
Environmental reasons	littering risk (earth)	littering risk (sea)	toxic product or contents		

Environmental background

The production of textile products –especially those made of cotton– has an important impact on global ecosystems. Nevertheless and according to available statistics, as high as 82% of total textiles used in Europe end up in landfills or incinerators and only 8% is being reused. The remaining 10% is recycled. Hence most of the value of the materials produced to be used in the textile sector is lost at the end of life.

The environmental benefits that may arise from recycling are because the environmental burdens associated with the manufacture of new products can be avoided. Benefits can also be due to avoided disposal of wastes provided that these impacts are higher than those of the recycling processes themselves. Although textile recycling is one of the oldest types of recycling, the average rate of textile recycling is still somewhat low. This rate can also differ greatly from one country to another depending on factors such as infrastructure and education.

The advantage of reusing clothing is to prolong its useful life, thus reducing the need to produce new natural or synthetic fibres. In the baseline model, 8 % of discarded clothes were considered to be Reusing clothing offers environmental benefits as second-hand clothing prevents the need for producing new items. These benefits are dependent on the substitution ratio between new clothes and second-hand clothes. This ratio is likely to be higher and closer to 1 in developing countries than in the EU.

Depiction of system

KERBSIDE COLLECTION:

Most textiles are collected through bring systems, which means that the waste is collected from consumers through recycling stations that have a dedicated container. Recycling yards have also containers for textiles. Finally, another important collection is done through social associations or charities collect used clothing from houses or at collection actions.

EPR SCHEMES:
France is the only European state that has an EPR scheme for textiles.
This regulation is to engage producers in considering end of life of their products when putting it on the market. Every company that introduces clothing, household linen, and footwear items on the French market to sell it under their own brands, must either:

- set its own internal collecting and recycling program accredited by the French authorities
- or pay a contribution to Eco TLC (the company accredited by the French Public Authorities to manage the sector's waste) to provide it for them.

The funds collected are used towards supporting:
- All sorting organisations that respects Eco TLC requirements;
- R&D projects that are selected by a scientific committee to find news outlet and solutions to recycle used TLC;
- Communication campaigns organised by local authorities to motivate end used to change consumers waste sorting habits.

The contribution is annual, based on the last year's volume put on the market crossed with the size of each items:
4 sizes for clothing and linen (TPP, PP, MP, GP)
2 sizes of footwear.

In 2015, collection rate reached 32,5% and 62% of what was collected was reused; 32% of collected was recycled.

BUY BACK:
There are several international clothing companies that have implemented a buy-back program for used clothes. Many of them are through a partnership with I:CO a global solutions provider for clothing and shoes reuse and recycling.

Customers bringing back used clothing are entitled to receive a voucher giving money off your next purchase. Vouchers are tied to the exhibiting partners and only redeemable during their period of validity.

Examples of buy-back schemes are:

Levi Strauss (US and UK): Any consumer who brings an item of clothing to recycle will receive a voucher for 20 percent off a single, regular-priced Levi's item in-store. I:CO, our clothing collection partner, will ensure that the discarded garments and footwear are re-worn, repurposed or recycled.
H&M: Bag of used clothing in exchange for 5€ every 30 € of purchase.
Calzedonia (Europe): There will be 5 euros off the purchase of a new beachwear item for women, 3 euros for menswear, and 2 euros for childrenswear.
Intimissimi (Europe): There will be 3 euros off the purchase of a new bra for women, 2 euros for shirts, and 1 euros for underwear.
Columbia (only at participating stores in the USA): Each time you bring in items to recycle, you'll receive a voucher for 10 percent off a Columbia purchase of $75 or more. You can get one coupon per day.

Clothes and shoes arrive at a textile processing facility and are evaluated and sorted for re-wear, reuse or recycling depending on specific sorting criteria.
Products that are still wearable will find new homes through the second-hand market. Products that are worse for wear will be reused in their natural form but get another life in applications such as cleaning cloths or toys. Products that cannot be reused will be recycled into raw materials and used for new products such as running tracks, insulation, carpet padding or even fiber for new fabrics.

Proposal

Deposit scheme
Collection rates seem to be the weakest link in the reuse and recycling system as reuse circuits and recycling technologies exist. To solve this problem a deposit scheme could be set up on textiles, specially on short lived clothing. The amount of the deposit could be different according to the kind of product and the materials used in it.

Refundable tax
Alternatively, a (partially) refundable tax could be set up on textiles, specially on short lived clothing. The amount of the deposit could be different according to the kind of product and the materials used in it.

Countries

More information

H&M Will Take Your Old Clothes So You Can Buy New Stuff For A Discounthttps://consumerist.com/2012/12/06/hm-will-take-your-old-clothes-so-you-can-buy-new-stuff-for-a-discount/

http://norden.diva-portal.org/smash/get/diva2:791003/FULLTEXT01.pdf

H&M Launches First Global Clothing Collection Recycling Programhttp://www.triplepundit.com/2012/12/sustainable-hms-new-global-clothes-collecting-initiative/

Environmental Improvement Potential of textiles (IMPRO Textiles:
http://ftp.jrc.es/EURdoc/JRC85895.pdf

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4.5 Discarded proposals

Proposals for non existing EPR (legal initiatives)

Product	**Coffee capsules**					
Consumption (World)	17.000.000.000	units				
Collection rate (EU-25)	N/A	tons				
Recycling rate (EU-25)	N/A					
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme	Buy back	Take back	
Market	**B2B**	**B2C**				
Start of the chain	Retailer	**producer**				
Management option	Recycle	**Reuse**				
Reason to implement an incentive - economic reasons	**valuable material**	strategic material	costly separation			
Technical reasons	**no existing process for recycling**	no existing collection	**difficult to separate at sorting facility**			
Environmental reasons	littering risk (earth)	littering risk (sea)	toxic product or contents			

Environmental background

Single-serving options in a variety of flavours are becoming increasingly available worldwide. Coffee capsules accounted for about 15% of the coffee market in the USA and EU in 2014, with shares as high as 35% in the Netherlands or above 20% in France. (P&A Coffee Newsletter, 2014). The worldwide market is estimated at 17 bn units yearly.

Coffee capsules cause an unnecessary resource consumption and waste generation, and although producers rightly claim that their products are recyclable (the capsule) and compostable (the coffee grounds), the process is not straightforward and even varies by brand.

The main problem is that for the recycling process to take place the capsules need to be collected and the recyclables separately treated and there is no general collection system with enough capillarity.

By not providing a general way of collecting their product, coffee capsules manufacturers are not complying with product responsibility and authorities fail to make the producer pay for the waste they put in the market.

Moreover, the packaging directive excludes explicitly coffee capsules that keep the coffee inside them from the definition of packaging and prevents them from being collected through yellow bins. In the case that this would be possible, the small size and the complexity of the packaging –often a mix of different materials– combined with the remains of coffee ground makes them difficult to process in the standard municipal waste sorting plants.

Depiction of system

TAKE-BACK SCHEMES:
Companies producing capsules should set up take-back systems that allow them to recover the coffee grounds to make good compost and the capsule to be reused –when possible- or recycled with as high as possible targets.
Although brands like Nespresso have set take-back schemes, no results of such schemes is publicly available. In some countries, Nespresso capsules can be collected through the national packaging recycling scheme as is the case in France, Germany, Sweden and Finland. In other countries, national or local recovery and recycling schemes are absent altogether or ill-equipped to separate lightweight aluminium from other packaging for revalorisation.

DEPOSIT SYSTEM
A good way to make sure that coffee capsules would go back to the producer would be to set a deposit system that would encourage the consumer to get involved in the process. Such a deposit system could be set up privately by each brand or collectively as coffee capsules producers.
However, these costs could be internalised only with a fraction of the budget they dedicate to marketing. Only political will is lacking to make polluter pay.

Proposal

Deposit
Because of their size and multiple materials, coffee capsules are very difficult to collect and separate within current collection and recycling system. A deposit could be set to all coffee capsules unless they can be disposed of in the biowaste collection system. Diposit-bearing capsules should then be redeemed at retailers.

Countries

Germany

Proposals for non existing EPR (legal initiatives)

Product	**Tyres**					
Consumption (EEA)	3,3 million	tons				
Collection rate	> 80%					
Recycling rate	40% recycling + 18% reuse					
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme	Buy back	Take back	
Market	**B2B**	**B2C**				
Start of the chain	retailer	**producer**				
Management option	Recycle	**Reuse**				
Reason to implement an incentive - economic reasons	valuable material	strategic material	costly separation			
Technical reasons	no existing process for recycling	no existing collection	difficult to separate at sorting facility			
Environmental reasons	**littering risk (earth)**	**littering risk (sea)**	**toxic product or contents**			

Environmental background

Tyre waste is an increasingly important issue threatening the economy, environment, and public health and safety. In the absence of adequate markets for recycled waste tyres, they have been disposed in landfills or dumped illegally, or burned in cement kilns. Furthermore, waste tyres are highly flammable and release toxic pollutants when incinerated. Waste tires can serve as a nesting area for pests and a breeding ground for mosquitoes that spread encephalitis and other illnesses. The results of waste tyre can be urban blight and significant costs to residents.

While used tires are composed of relatively inert material and pose no direct harm to the environment, whole tires are banned from most landfills in highly populated areas. The inherent physical properties of tyres, coupled with soil, garbage, gas movement and freezing and thawing, result in the phenomenon of tyre surfacing, whereby, over a period of years or decades, a large percentage of buried tyres simply work their way to the surface of the landfill. (http://publications.gc.ca/Collection-R/LoPBdP/BP/bp431-e.htm)

Depiction of system

DEPOSIT_REFUND Since 1988, Rhode Island has required $5 deposits on all types of replacement vehicle tires. Customers can recover their deposits by returning old tyres within 10 to 14 days after they purchase new tyres. Their refund payments are limited to one tyre for every tyre purchased, and the refunds can be obtained only at the point-of-sale of the new tyre. In addition to the deposit, Rhode Island, along with most other states, imposes product charges on tyres to finance the cleanup of piles of old tires. In addition to the deposit, Rhode Island, along with most other states, imposes product charges on tyres to finance the oversight of scrap tyre handling, disposal, and recycling. Similar system are available in British Columbia, Canada. (https://yosemite.epa.gov/ee/epa/eerm.nsf/vwAN/EE-0216B-06.pdf/$file/EE-0216B-06.pdf)

In most US states the deposits are not refunded to consumere but go to actual recyclers. Therefore a variation on the deposit-refund concept still applies in many states; the revenues collected through deposits are used to subsidize scrap tyre processors or sales of products made from scrap tyres. (Walls, 2011)

TAKE-BACK In Flandres Belglum is a EPR scheme, the consumers pay an environmental fee that is used for the collection and treatment of used tyres. The fee depends on the type of tyre. The fees range from € 1,32 including VAT of 21% (e.g. motorcycle tyres) to €794,37 including VAT of 21% (e.g. tyres from some vehicles for public works and construction services). The fee is mentioned separately on the consumer's receipt. The fee represents the cost for collection and treatment and is transferred by the producers to Recytyre. The used tyres are stored at collection points (car dealers, repair shops, tyre dealers, and municipalities). The collection points contact a collector, who transports and sorts the tyres. Then, the tyres are reused, retreaded or treated by one of the private players in the sector. The 2011 evaluation report states that on average 88% of all waste tyres is collected, meaning that the target is met**. When considering only the replacement market, a collection rate of 99% was achieved**

Proposal

According to industry data, collection rates for tyres in most European countries is high enough so an economic incentive for collection isn't needed. Neverthless there is concern on recycling and reuse operations being overtaken by incineration in cement kilns. Probably ecodesign and reycling rate requirements would be needed.

Countries

US, BE

More information

Waste Tires Used For Roads: https://www.uvm.edu/~vlrs/Transportation/tires.pdf

Proposals for non existing EPR (legal initiatives)

Product	Automobile batteries				
Consumption (EU-28)	N/A	tons			
Collection rate (EU-28)	N/A	tons			
Recycling rate (EU-28)	N/A	tons			
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme	Buy back	Take back
Market	**B2B**	**B2C**			
Start of the chain	retailer	**producer**			
Management option	Recycle	**Reuse**			
Reason to implement an incentive - economic reasons	**valuable material**	strategic material	costly separation		
Technical reasons	no existing process for recycling	no existing collection	difficult to separate at sorting facility		
Environmental reasons	littering risk (earth)	littering risk (sea)	**toxic product or contents**		

Environmental background

Used car batteries and other lead acid batteries contain lead, lead compounds, and/or sulphuric acid, all of which are hazardous. They should be dealth with appropriately through recylcing or reuse programmes to avoid harmfull disposal. Lead-acid batteries are also found on boats, motorcyles, air conditioners, emergency lighting etc. Lead is a cumulative poison in human bodies and is also harmful to the environment, particularly fish, animals and plants.

Each car battery contains around 2-3 litres of sulfuric acid, as well as lead, and lead compounds, all of which are toxic. Car batteries can be re-conditioned or recycled into new products made from the lead, sulphuric acid and polypropylene. Recycling of these batteries uses less energy than refining primary ore and removes lead from the environment. Car Batteries can be recycled into a range of products from plant pots, to laundry detergents and new batteries.

Lithium-ion car batteries are not yet wide spread, but since lithium is a rare material, proper collection similar to acid batteries could be envisaged

Depiction of system

TAKE-BACK: Almost all scrap metal merchants will accept used lead-acid batteries. Collection services are also available at most landfills, transfer stations, and automotive workshops. The instrument is a take-back system where the consumer can return the batteries free of charge for recycling or reuse. The system is set up by producers or importers of batteries usually through a collective scheme such as recovery operators.

DEPOSIT-REFUND: In some US states like Arizona when any new leadacid battery is purchased, an additional fee of five dollars is charged by the reatiler unless a used battery is returned for a refund within thirty days. Point-of-sale notices must be printed by battery retailers. In all 50 states, retailers can charge a battery core charge when one purchases a car battery. In over 30 states, it is required by law. For example Battery Council International proposes the following as part of a model battery recycling legilsation:
A retailer selling replacement lead-acid batteries in the state shall:
b) Collect a deposit of at least $10.00 on the sale of an automotive type replacement lead-acid batterythat is not accompanied by the return of a used lead-acid battery of the same general type. All deposits shall inure to the benefit of the retailer unless the person paying the deposit pursuant to this subsection returns a used automotive lead-acid battery to the retailer within thirty days of the date of sale, in which case the deposit shall be returned to the customer;

A Deposit Refund System (DRS) operates in the market for lead-acid batteries in India, but a large percentage of batteries are recycled by the informal sector in ways that are harmful to health and the environment. To address this issue, the Ministry of Environment and Forests created the Batteries Management and Handling Rules (BMHR 2001) as part of a national policy to encourage environment friendly lead-acid battery recycling. The Deposit Refund System was operational for lead acid batteries even before the BMHR (2001) and is very effective at encouraging consumers to return used batteries to retailers. However, organised recycling of the lead from these batteries is only undertaken in a limited manner. Instead, retailers prefer to sell used batteries to the informal sector, where they are recycled in ways that cause a wide range of environmental problems. The study recommends alternate policies to address this issue, including a green tax on batteries coupled with a refund that would be paid when manufacturers ensure that batteries are recycled in an environment-friendly way.

Proposal

According to available data, collection rates for car batteries are quite high and many of them fall within the scope of ELV regulations. Moreover lead prices in the market create enough incentive for them to be properly collected. An extra economic incentive for collection it's not recommended.

An area of research is the impact of the growing electric car market. There are different models of batteries but most of them use metals that need to be guaranteed not to be lost. In this case, a deposit or other economic incentives would make sense.

Countries

AU, US+ IN deposit, EU

More information

http://recyclingnearyou.com.au/car-batteries/
India http://www.sandeeonline.org/uploads/documents/publication/991_PUB_Policy_Brief_62_Yamini_Gupt.pdf
Battery council international proposed model battery recycling legislation https://batterycouncil.site-ym.com/resource/resmgr/BCI_Model_Legislation.pdf

Proposals for non existing EPR (legal initiatives)

Product	**Cigarette butts**				
Consumption (EU-28)	6.000.000.000.000	units			
Collection rate (EU-28)	<35%	units			
Recycling rate (EU-28)					
kind of existing or proposed instrument	Leasing	**Deposit-refund**	Refundable tax scheme	Buy back	Take back
Market	B2B	**B2C**			
Start of the chain	retailer	**producer**			
Management option	Recycle	**Reuse**			
Reason to implement an incentive - economic reasons	valuable material	strategic material	costly separation		
Technical reasons	**no existing process for recycling**	**no existing collection**	difficult to separate at sorting facility		
Environmental reasons	**littering risk (earth)**	**littering risk (sea)**	**toxic product or contents**		

Environmental background

Cigarette filters contain cellulose acetate, a form of plastic that isn't biodegradable and can take up 10 years to decompose. The toxins inside are detrimental to marine life and other animals, who sometimes mistake the butts for food. They are an environmental blight on streets, sidewalks, and other open areas. Carried as runoff from streets to drains, to rivers, and ultimately to the ocean and its beaches, cigarette filters are the single most collected item each year in international beach cleanups. Rather than being a protective health device, cigarette filters are primarily a marketing tool to help sell 'safe' cigarettes. They are perceived by much of the public (especially current smokers) to reduce the health risks of smoking through technology. Filters have reduced the machine-measured yield of tar and nicotine from burning cigarettes, but there is controversy as to whether this has reduced the disease burden of smoking to the population.(The Cigarette Butt Pollutiion Project – CBPP). CBPP also points to four potention options to reduce environmental impact of cigarette filer waste:

Increasing fines and penalties for littering butts
Monetary deposits on filters
Increasing availability of butt receptacles
Expanded public education
Cigarette butts collected from beaches are in large number ICC reported 1,684,183 cigarette butts (33.6% of all debris) in the 2007 US Cleanup, though a comprehensive cleanup in Orange County, California, yielded 20 times more butts than the estimated ICC total for that beach for the same year (Novotny, Lum, Smith, Wang, & Barnes, 2009)

There have been **several bill initiatives line in Maine 2008, NY 2010, US,** but they did not move forward. The **bill in Maine** was proposed in 2008 and If enacted, it **would have required cigarette manufacturers to mark filters on each cigarette sold in Maine with 5-cent deposit notices. Smokers would had to pay an additional $1 a pack in deposits. Fund that would help disburse the money. Additionally there has been few pilot initiatives by civil society.** In 2013, during Vancouver's Car Free Day, members of the West End Cleanup group ran a **pilot project that gave between one and 10 cents per butt or $20 a pound. Within half an hour, they gave away more than $200 in refunds.** A German initiative called Penny for Butt introduced a deposit-refund scheme. The deposit box is sold with the cigarette.The cigarette butts are plugged into the pledge box. On Pawn Machine the pledge money will be paid. **For the moment there seems to be no offical systems for charging any fees on cigarette butts**.

In a 2014 report Eunomia R&C proposed «Levies on chewing gum and cigarettes to ensure that clean-up costs are borne by the users of these products rather than the public at large. » http://www.eunomia.co.uk/reports-tools/a-clean-sweep/ (Collins S & Stigler P, 2014) reviewed different options for addressing the environmental concers asociated with tobacco product waste and cigaretted butts in particulat. They suggest that a combination of EPR and Product Stewardship approaches could

Depiction of system

be used for TPW prevention, reduction, and mitigation. This could be made the responsibility of the tobacco industry as well as other parties in the lifecycle of tobacco product sales and usage through EPR/PS. These could be legally binding and/or voluntary programs for cleanup, take-back, and final disposal. Similar to beverage container deposit laws, cigarettes could be sold with a "butt deposit"to be refunded when the cigarette butts are returned to the vender. **The challenge in such a program would be to develop safe transport and destruction mechanisms for TPW as part of a take back and disposal regime**.

A company called TerraCycle offers recycling of cigarette waste, it is a voluntary system in which participants send their litter at their own costs. The company donates $ 1.00 per pound to a litte prevention programme. https://www.terracycle.com/

In Toronto, CA, authorities investigated in 2013 the possibility to implement a fee for cigarette manufacturers to help offset costs incurred by the City to cleanup cigaretted but litter. San Francisco intoduced a $0.20 fee on cigarette sales in 2010 to cover costs for cleaning up smoked butts, as of 2017 the fee is at $0.60. According to the City Controller's street standards report "Evaluators found less litter and grime across The City's streets and sidewalks, and approximately twice as many more routes were free of 'excessive' litter compared to FY 2014-15," As of 2016 Copehagen authotiries are considering introducing a 2 crown deposit system on garbage, that may include cigarette butts and fast-food packaging

Proposal

Athough setting a deposit on cigarette butts may seem possible, technical problems are quite relevant and need to be further studied; thus, no deposit is recommended.

One of the main issues –biodegradability– would be possible to deal with biodegradability requirements. Another main issue –littering costs– could be dealt by setting a tax on cigarette butts specifically for littering. This fund could be used to buy specific cigarette bins and to pay collection and specific treatment of butts. There would still be toxicity issues when biodegradable cigarette butts reached natural spaces so, further research on the topic would be needed.

Countries

fees in US, CA

More information

http://www.cigwaste.org/research/information/
http://www.penny-for-butt.de/

Cigarettes Butts and the Case for an Environmental Policy on Hazardous Cigarette Waste. International Journal of Environmental Research and Public Health, 6(5), 1691–1705. https://doi.org/10.3390/ijerph6051691

Collins S, C. C., & Stigler P, C. S. (2014). Extended Producer Responsibility and Product Stewardship for Tobacco Product Waste. International Journal of Waste Resources, 04(03). https://doi.org/10.4172/2252-5211.1000157

Cigarette Butt Deposit Bill Being Considered In Maine http://www.cnsnews.com/news/article/cigarette-butt-deposit-bill-being-considered-maine

NY law as of 2017 http://public.leginfo.state.ny.us/lawssrch.cgi?NVLWO:

NY law 2010 http://assembly.state.ny.us/leg/?bn=A11121&term=2009

4,5 billones de colillas, la primera fuente de basura del mundo, acaban en el suelo al año
http://www.20minutos.es/noticia/3055968/0/neumologos-alertan-riesgo-para-salud-colillas-tabaquismo-cuarta-mano/

5. Proposal of economic incentives to increase the recycling and reuse of certain products

Based on the existing experiences of the use of economic incentives for the collection of used products or waste, we have elaborated a proposal to expand the use of these instruments in certain waste flows. The proposal is classified according its potential use in existing EU level EPR schemes, not EU-level EPR schemes and what we call subsidiary producer responsibility.

5.1. For existing European-level regulated EPR schemes

Setting a deposit for certain waste flows currently under the scope of existing EPR schemes can help tackle some specific issues that are still in need to be properly addressed under current voluntary collection within producer responsibility organizations.

Packaging

Apart from the potential loss of materials and associated extractive environmental impacts that represents disposable items, certain packaging is very well known for its tendency to appear littered in public spaces or natural areas. Although the littering problem can happen with any packaging, it happens especially with products intended to be bought and consumed on-the-go –e.g. food and beverages–.

Exploring deposit in the packaging field has the main target to tackle the littering issue –both in public spaces and natural areas– as well as reducing the extraction of primary materials and create a level playing field for reusable alternatives.

Setting a deposit on **one-way beverages containers** has been done in many countries all around the world for many decades but not all the systems cover the same products and the same packaging materials. In the case of existing and future deposit systems for beverage packaging we recommend that at least water, beer, juices and soft drinks are included and that, in order not to distort the packaging market, all the major packaging materials are included –metal, glass, plastic, cartons and, possibly stand-up pouches. Further research needs to be done in order to explore if other products could be part of a deposit collection sceme: milk or cleaning products are potential candidates for such an idea.

Apart from securing high collection rates, deposit on beverage packaging represents an opportunity to enhance producer responsibility results by improving recyclability. The case of Norway is a good example with certain design requirements[4] –including types of plastic, inks and glues– allowed for a plastic bottle to be accepted in the deposit system.

Setting a deposit on disposable containers may not be enough to push the use of recyclables. In this case, a tax on disposables may also be interesting like that existing in Norway.

Apart from beverage packaging, there is also another kind of packaging that appears commonly on littering studies: **food wrappers** –e.g. crisps, biscuits, bars...–. This kind of food tends to be eaten outdoors or on the go and, are prone to be tossed. Moreover, being light-weighted they are easily taken away by wind.

As a complementary target, increase of recyclability is in this case even more relevant than in the case of beverage packaging as, very often, composite packaging –e.g. metallic and plastic layers– is used. Diverting as much as possible this waste stream from the general packaging collection system –where easier to recycle packaging is found– can improve general packaging recyclability and help to produce better alternatives of packaging. Also, unnecessary packaging –e.g. trays in the case of cookies– could be part of the deposit and its redesign scope.

Disposable **coffee cups** use is growing while there is no clear collection and recycling system for them as different materials are used –even multilayer material options exist–. Setting a deposit on disposable cups could help solve littering issues and would also set a level playing field for the implementation of reusable cups schemes be it at local level or at higher levels. Although a

4http://infinitum.no/file/10/d76f5cbeb26620a83c7cb0293f81bf23/161115_Ny_Tech_Spec.pdf

deposit on disposable cups would possibly show better results, a tax could also be considered as an easier way to push for recyclables.

A final waste flow that could bear a deposit is **food boxes**. Although they are considered transportation packaging and hence part of the commercial waste flow, food boxes –plastic crates, cardboard boxes or wooden crates– often appear in municipal waste collection systems.

Plastic crates are typically used as reusable packaging –and already bear a deposit– while cardboard packaging is the most frequent disposable solution. The typical use of reusable boxes is the transportation of fruit and vegetables, although other products such as dairy products or meat are transported as well using reusable boxes or trays.

The discussion whether one-way or reusable fresh produce boxes are better should from a life-cycle point of view should not hide the fact that both should compete in a level playing field. Thus, setting a deposit on one-way transport elements is needed to ensure that one-way fruit or vegetable boxes do not end in the municipal collection system creating costs and potentially being lost to recycling processes.

Batteries

The main objective of environmental policy in the case of batteries should be the phasing out of disposable batteries and its substitution for rechargeable batteries as they show a better environmental performance than the disposable ones.

When it comes to current management, it is a documented fact that most of the batteries are still not collected properly and an extrapolation of the collection rates from 2012 to 2014 suggests that around 20 of the 30 EEA are unlikely to meet the 45% collection rate in 2016 (Perchards, 2015). It's clear that, in opposition to large lead batteries, portable batteries have a negative value that provides no economic incentive for last owner to return them. It must be also noted that there is a general lack of consistency in the data reported by producers and importers that makes that current figures are not accurate enough; the degree of control of a deposit systems allows dealing properly with this issue.

All three issues make it recommendable to set a deposit on portable batteries that could be recovered when returned to sale points. Moreover, complementing a deposit with a tax on one-way batteries would work also as an incentive for a gradual phase out of disposable batteries.

WEEE

Some WEEE flows contain a high quantity of components that embed valuable materials such as precious metals or rare earths. Most of these materials have their origin outside the EU and its extraction have a huge impact both environmental and social with reported child labour and other human rights issues.

As an example, nowadays, less than 20% of the gold recycling potential is being realised from European WEEE due to the inefficiencies of the initial stages of the process chain. The collection stage is the weakest part of the chain. There is still a long way to go in Europe, and in many other countries, in organising efficient collection (CW Corti[5]).

For some EEE the setting of a deposit would make sense in order to encourage high collection rates. The amount of the deposit could be set depending on the amount and weight of the most valuable components –motherboard, memory modules, etc. –. Candidates to have deposit include notebooks, smart phones, cell phones or tablets, products that are portable and can be easily disposed of in improper waste collection systems. As higher collection rates could be also achieved by a refundable tax, further research needs to be done on elucidating if a refundable tax may be more recommendable than a deposit.

An issue that needs to be further studied is if, separating more strategic WEEE flows such as the above-mentioned would make it more appealing for waste managers to avoid export to third countries and inefficient technologies such as fragmentation and would promote easier to disassemble designs. It is also likely that illegal dismantling of these waste flow would be reduced. In any case, such a system would need to guarantee that potential reuse remains the priority and is not put into risk.

5http://www.lbma.org.uk/assets/Alch59Corti.pdf

5.2. For products with non-existing EPR regulation at European level

Although not regulated at European level and without many PRO existing, two main waste flows could be subject to EPR requirements and economic incentives. We have chosen them because of their growing tendency to become disposable products and because they have a lot of reuse potential –in fact, a well settled reuse economy already exists around them.

Textiles

Across Europe, it is estimated that only between 15 % and 20 % of the disposed textiles' tonnage is collected while the rest is either landfilled or incinerated. This represents a loss of materials to a sector –the reuse of textiles– that is very dynamic and provides most of the jobs in the reuse sector.

Setting a deposit on clothing –or at least some kind of clothing[6]– could easily increase these collection levels. In order to promote reuse, the amount of deposit returned could be modulated according to the state of the returned product.

Deposit on clothing should not be expensive nor technically challenging as collection does not require much infrastructure apart from sacks and boxes. Moreover, as the material value is positive, the collection and processing of the clothing could be self-sustained economically. If part of an existing EPR some arrangements could be done for producers to contribute to development of selection infrastructure and research and development. This could also be achieved by a refundable tax. Compulsory buy-back schemes may not be fair to small retailers that do not have the capacity to develop a proper management program and may not be able to compete with larger corporations.

An important aspect to be further researched and that needs to be taken into account is that deposit system should not result in monopolistic behaviours by big brands that undermine existing reuse economy; in this aspect, social organizations should have priority in receiving the collected materials.

Mattresses

Furniture collection systems create costs on local administration that –in most countries– are not even partly shared with producers as no EPR schemes exist. Closely related to furniture, mattresses are usually part of the same collection system and are easy to find abandoned in inadequate places.

An economic incentive, such as a deposit or a refundable tax, could be set on mattresses and returned when delivered to recycling yards or other designated collection points. Return should be possible both by retailers or by final consumers.

5.3. Subsidiary producer responsibility

Although the European Commission encourages some members states to implement new EPR schemes it cannot be expected that all the products that eventually become waste at their end of life are managed through an EPR scheme. While potentially around 60% in weight of total products could be part of an EPR scheme, there exists still open field to discuss how to develop EPR policies for the remaining 40%.

Instruments such as tax on raw materials on products without EPR schemes could be simple enough to be a first proposal. This kind of taxation may be easy to control and would help to provide funds for local administrations for the collection and treatment of waste, but would not be enough to address some issues such as the redesign of products or achieving high collection rates. For this, more strict EPR provisions would be needed and economic incentives can play a role. For this public policy outside the scope of existing EPR schemes we propose the name “subsidiary producer responsibility”.

Small disposable products

6Main garment like shirts, trousers, skirts, jackets should be part of the system. But also blankets, towels, tableclothes and other household –and commercial– textiles.

A panoply of small disposable products exist and they appear mainly in the mixed waste stream. Many of this are products for which reusable alternatives exist. We propose that a deposit for such products is set in place to return used products at any point of sale.

Products that could be part of this approach should be small products that although being made of plastic or metal would be mostly lost even if they were accepted in the existing recycling systems. Such products could be: coffee capsules, razors, ink printer cartidges, etc.

In parallel with a deposit, a tax could be set that would act as a simple stimulus to redesign would be a product levy – a charge, or set of charges, designed to shift behaviour from certain products towards better alternatives. A product levy could be applied to a range of environmental impacts associated with products, such as high energy or water use. However, high on the hit list would be disposable, or non-recyclable and hard-to-recycle products such as cameras, disposable phone chargers, non-refillable printer cartridges and non-rechargable batteries. All of these have clear, less wasteful alternatives. (A Zero Waste UK, IPPR, 2006

Chemical product packaging

One of the challenges of the recycling industry in the circular economy is to avoid the recirculation of toxic products in the secondary materials. One of the potential sources of such contamination is the recycling of packaging that have contained chemical or hazardous products that are used in households.

To limit the risk of these substances re-entering the material cycle a deposit could be set to chemical packaging for products such as acids, bases, aerosols, pesticides/biocides, combustible, paints, thinners, varnish, oils or other similar products.

Sanitary textiles

Around 3-4% of total municipal waste is sanitary textile that cannot be currently recycled and for which reusable alternatives exist. Albeit a deposit is not feasible due to sanitary reasons, other incentives –although not to consumers but to producers– could be explored such as a refundable tax could be set on disposable products such as nappies, tampons or sanitary pads. This tax could be returned to producers according to the amount of such products separated from mixed waste stream and further processed to recover recyclable materials.

	Existing EU level EPR schemes[7]			Non existing EU level EPR schemes		Subsidiary producer responsibility			
	Packaging	**Batteries**	**WEEE**	**Textiles**	**Furniture**	**Small items**	**Other**		
Avoid littering public spaces and environment	Beverage Packaged food Cups				Mattresses Furniture				
Prevent pollutants from being dispersed in the environment	packaging for chemical products	Portable batteries							
Avoid loss of valuable materials			Mobile phones Tablets Laptops	Clothing					
Non-existing collection system						Coffee capsules Cartridges for printers Razors Disposable small items	Sanitary textiles		

Table 2: Summary of the proposal

7ELV is not included in the table as it's a flow that falls outside the scope of municipal waste.

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