

Complex Waste Plastics Recycling Industry ‘Wish List’ to promote a rapid transition to a Circular Economy

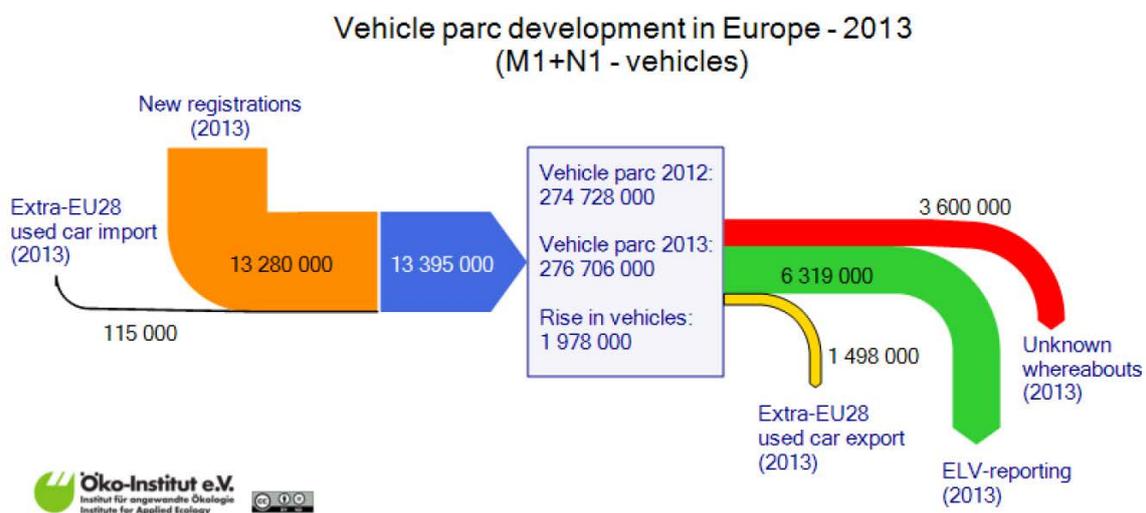
Purpose

This document summarises the shared opinion of some key players in the plastics materials recycling sector from complex wastes of durable products such as End-of-Life Vehicles (ELV's) and Waste of Electrical and Electronic Equipment (WEEE) concerning the market drivers for change needed to promote a transition towards a 'true' circular materials economy in the industry.

In the next 2 years we will see an increasing level of discussion and debate about the shape of the EU's Circular Economy Package. This document should be seen as a plea to leaders, innovators and key influencers involved in that debate by setting out a simple set of measures that will help to drive change in a positive direction to promote the Circular Economy.

Key Facts

Automotive - There are an estimated approximately 275 Mio motor vehicles registered for use on the road network of the EU member states and this represents an impressive urban mine of materials. New vehicle production continues to grow steadily with quickly changing technologies. The average mass of each new motor vehicle is approximately 1.3 tonnes, of which currently about 20-25% consists of plastics or elastomer material which is made primarily from non-renewable oil-based resources. The annual plastics consumption for the car industry in Europe is close to 4 Mio tonnes per annum. The currently reported quantity of End-of-Life Vehicles (ELVs) consists of 6.3 Mio ELVs per year and this represents a quantity of ELV plastics of some 1.2 Mio tonnes. It is estimated that the potential for use of Post-Consumer Recycled (PCR) plastics used in new-build cars can be as high as 5% of vehicle mass, which would have a huge environmental benefit.



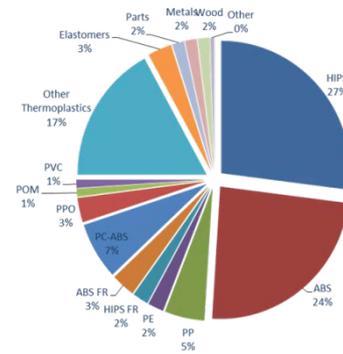
Graph – Vehicle Parc Development Öko-Institute / IARC Conference Berlin 2016

Electrical & Electronics – The quantity of Waste from Electric and Electronic Equipment (WEEE) is some 9.5 Mio tonnes per annum, of which quantity approximately 5-6 Mio tonnes are being recycled in Europe. Some 1.2 Mio tonnes of this material are plastics materials. Technology exists to recycle over 50 % of this material into Post-Consumer Recycled (PCR plastics) and the remaining quantity which cannot be recycled as material can be used for energy recovery. A recent Life-Cycle Analysis

comparing the production of virgin plastics with the production of PCR plastics illustrates the benefits of using PCR plastics.

The total demand for plastics for the production of Electric and Electronic Equipment (EEE) is 2.5 Mio Tonnes per annum.

The practical application of PCR plastics for the production of new Electric and Electronic Equipment has been proven in a significant number of cases.



Graph – composition of WEEE shredder residues (Source MBA Polymers)

Current Materials Recycling Model

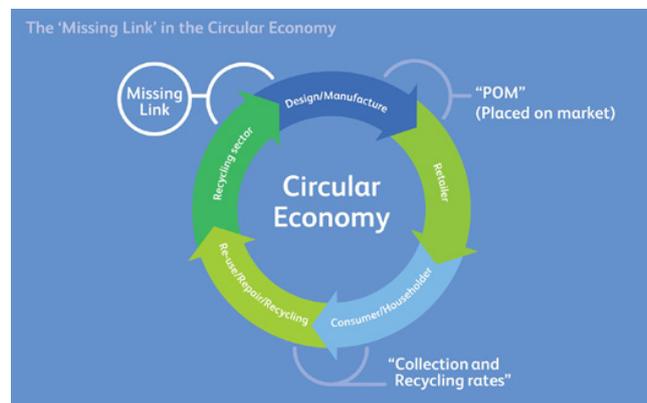
The producers of automobiles and electronics across Europe have been given the responsibility for the end-of-life capture, collection and recycling or recovery of the products that they put on the market.

Under this Extended Producer Responsibility (EPR) legislation the focus is placed upon ‘polluter pays’ by making branded manufacturers and importers share the financial burden of the cost of collection and recycling. There are several variations on the way this is implemented across Member states, but most link the brand’s current market share in tonnage terms to the cost of collection, treatment and recovery measured at the point of waste collection, which responsibility is outsourced to take-back or similar systems in many of the cases.

Current legislative measures have already placed high targets on the percentage of end-of-life products that must be recycled or recovered.

The European ELV directive prescribes a total recovery rate of 95% of which 85% as (material) recycling rate and the European WEEE directive as varying recovery and recycling targets depending on the category of WEEE and these targets are growing over time. Consumer Electronics and IT currently have a recovery rate target of 80% with a (material) recycling rate of to 70% and Large Domestic Appliances 85% recovery and 80% (material) recycling rate.

This ‘arms-length’ approach to ‘responsibility for end-of-life’ has failed to create a circular flow of recycled materials back into new products. Most manufacturers have transferred their responsibilities for collection and treatment to take back schemes. The collection and treatment is considered a cost factor and therefore continuous price pressure on these services is eminent. Therewith the compliance with the Directives has become an annual accounting exercise. There is virtually no involvement by product designers, materials purchasers, marketing managers, production engineers in the process of satisfying end-of-life product responsibility. The disconnect between the return flow of materials – take-back, collection and recycling - and the design, procurement and sales of new durable products can be seen as the “missing link” in the Circular Economy.



Graph – Missing link in the Circular Economy.

The long lifetime of products in the vehicle and electrical goods markets (i.e. 2 years to 20 years) also means that there is a long delay between making a product and that item reaching its end-of-life stage, where the materials can be captured, separated and recovered for recycling or re-use. This increases the level of 'disconnect' between those people involved in design and development of new products and the growing industry involved in recycling of materials from old products (unlike packaging materials, where the working lifetime is measured in days or weeks and forward thinking businesses can get very rapid benefits by tapping into the readily available flow of plastics materials being recycled from household waste collections).

Manufacturing industries are to a great extent still operating a linear model for sourcing and use of raw materials to create a this growing volume of durable products.

This huge mountain of durable goods - destined to enter the waste stream at some stage in the future - represents a predictable, know composition urban mine of material that could and should enter into an efficient collection and recycling infrastructure that is laid out to deliver these materials back into manufacturers as a sustainable and stable flow of Post-Consumer Recycled secondary raw materials.

The plastics recycling industry for these complex raw materials is capable of producing products that comply with product legislation. However, the ever changing thresholds for an ever increasing amount of substances under REACH and POPS legislation form a considerable burden for this new industry with a risk that the investment levels will come to a halt. Legacy issues require a holistic approach starting at product design stage. Whilst the industry is capable of reducing the legacy of substances to the greatest possible extent, the recycling industry will not be able to eliminate all substances of concern completely. This must be recognized whilst setting new thresholds for raw materials, whereby it is important that there is an alignment of these thresholds for wastes and for products. For some substances reasonable exemptions for recycling might be required.

Continuously changing threshold values for ever more substances in the EU legislation impacts the development of a recycling industry infrastructure negatively and hence has a negative impact on the development of a recycling society and circular economy that the EU Commission is seeking. Today many of the valuable raw materials embedded in these durable goods are still exported out of Europe, often illegally. The European Waste Shipment Regulation's rules on notifications of "non-listed wastes" – many of the mixed materials from these durable goods are considered to be notifiable wastes – sets rules and procedures to the transboundary shipments of these raw materials that are often prohibitively complex, long and expensive. These rules and procedures for these raw materials are the same as what is required for most hazardous wastes. Much of this potential input for compliant European recyclers therefore leaves the European Union, as the enforcement of these rules for the export out of the EU is virtually non-existent.

While many innovative, entrepreneurial, technology leaders have taken the early-stage steps to invest in the new processing industry to recycle these durable end-of-life products, there is now a great opportunity to capitalize on the learnings and experience of those 'first-movers' and to help catalyse a transition across the sector to a much more circular material flow economic model.

Creating drivers for change

Speaking from the combined experience of over 25 years of actually operating within the EU and global recycling industry for these products, key players in the sector have shared the following points as a 'wish list' of principles that must be included in any new set of measures and legislative instruments put in place to help deliver a circular economy in the sector.

The Plastics Recycling Industry Wish-List

Procedures for the procurement and transboundary shipment of complex mixes of raw materials for the production of secondary raw materials by compliant recyclers within the EU should be made easier, quicker and cheaper. Pre-consented and verified facilities within the EU have a special status, which should be recognized by the competent authorities in country of despatch. A **FAST-TRACK NOTIFICATION** procedure should be developed to allow these compliant recyclers to get better access to these complex input materials from other countries within the EU.

The primary focus of any new measures should **AIM AT PULLING THE DEMAND FOR** Post-Consumer Recycled content in order to convert the linear supply chain to a circular material flow model. The industry already has high targets in place for the collection of end-of-life products and with high recovery and material recycling targets set in those regulations. The missing link in the Circular Economy is the communication between the recycling companies and the producers of durable products – the Circular Economy Package should encourage this by rewarding the incorporation and use of traceable Post-Consumer Recycled (PCR) content back into new products. This could take the form of:

- **Public Green Procurement** rules to enforce a change towards products that contain well-defined quantities of PCR content. This to cover durable product purchases, electrical and electronic goods, vehicles and construction materials in addition to the 'easy-wins' in short life consumables such as printing paper, packaging (Example – EPEAT in USA federal law).
- **Private sector** – drive Member states to implement positive, reward-based drivers to encourage product manufacturers to specify and use recycled materials (especially plastics). Measured and proven levels of PCR use should be encouraged by positive benefits accruing to those companies who make the changes (e.g. increased R&D and/or capital investment tax allowances linked to higher levels of traceable PCR content in new products).

Enabling this to happen in Europe

One key area that needs to be recognized during the envisaged 'transition period' from a linear manufacturing economy to one that embodies CIRCULARITY, is a pragmatic recognition that the huge urban mine of materials that is already in place will contain some materials and additives that are no longer seen as desirable in modern materials (i.e. at least 15 years of in-use cars or some electronic products to be processed when reaching end-of-life).

The legal situation that applies to the recycling industry with both waste and product legislations that apply (REACH, ROHS for products, POP, WSR, WFD for waste) is extremely complex. For example, the Waste Framework Directive does not allow any mixing of materials with the purpose to reduce the levels of these substances of concern.

Technology is available to produce secondary raw materials made from durable goods that meet current product legislations. However legal initiatives and thresholds for particular substances change continuously. There are pressures to define new thresholds for certain substances – such as some brominated flame retardants - to levels beyond those that can be measured reliably or to levels that can be reached technologically for secondary raw materials.

The recycling industry therefore calls for **realistic THRESHOLDS** for substances of concern and for a continuous exchange of views between the legislator and the recycling industry if changes are planned. In some cases, a solution can be found by creating exemptions for certain thresholds for PCR materials for well-defined periods of time. In other cases, the most desirable route forward is to re-incorporate the captured plastics containing such additives back into new long-life products (e.g. stabilizers in PVC window frames).

Therefore, a key addendum point in the industry wish-list is:

- Regulators across member states to take a pragmatic and balanced approach to the allowable levels of residual trace legacy additives remaining inside recycled plastics during the extended period of transition to a circular material flow. (maybe next 10 – 20 years)
- Set levels of allowable trace chemical additives that are realistic in terms of the risk posed and sensible in terms of actually being detected by laboratory instruments in general use.

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