EERA's position on the stakeholder consultation

Chemical, Product, Waste interface

This document outlines the perspective of the E-Waste Recyclers regarding EU action plan for the Circular Economy and in particular the interface between the EU chemicals, products and waste legislations.

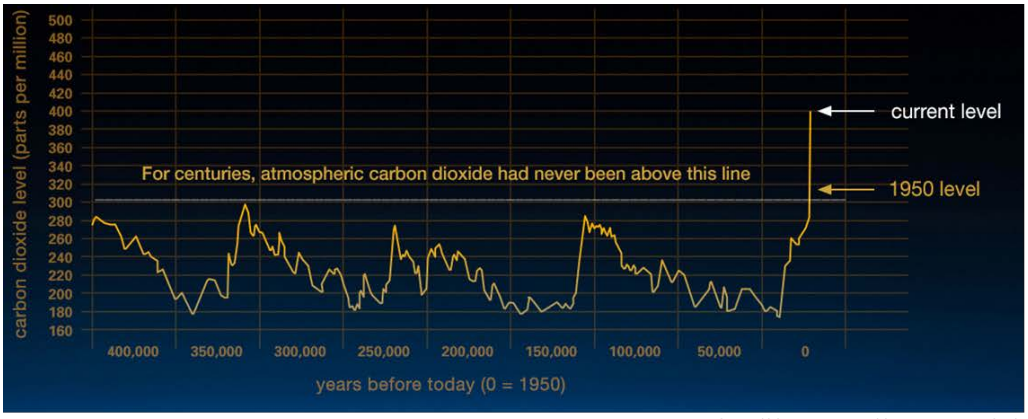
The consultation paper quite rightly identifies a number of barriers that need to be overcome to avoid too great a burden for recyclers, addressing the presence of substances of concern, facilitating traceability and risk management of chemicals in the recycling process. EERA proposes to develop a balanced approach between the challenges of global warming, depletion of resources and the perspective of a non-toxic world, whilst keeping in mind that recycling should be supported.

Balanced approach needed.

Two key environmental concerns are generally not considered when discussing a toxic-free environment.

CO2 concentration in the atmosphere

In the several 100-thousand years before the early 1950-ies, the CO_2 concentration in the atmosphere remained under the level of 300 ppm. As from the 1950-ies the CO_2 concentration quickly rose. The atmospheric concentration CO_2 that we have reached is well above 400 ppm. The last time that it was at this high level, there was hardly any ice on the planet, the global temperature was 6 degrees C higher, the sea level was 30 meters higher and there were no human beings.



https://climate.nasa.gov/climate_resources/24/

May 2017: 409,7 ppm CO_2

The CO_2 concentration is one of the key environmental threats that humanity is facing and yet the emission of CO_2 is free of charge and it is completely de-coupled from any discussion over chemicals and toxic substances. Yet E-Waste recycling business contributes enormously to the reduction of CO_2 emissions by preparing resources that have been used in electronics to be re-introduced in the Circular Economy.

Depletion

The economic depletion – even based on a static consumption assumption - of a number of metallic and fossil resources is less than a century away.

Metals and engineering plastics are of key importance in the manufacture of electronics and these resources are part of the challenge that the society is facing in its transition to a low carbon, resource efficient green economy.

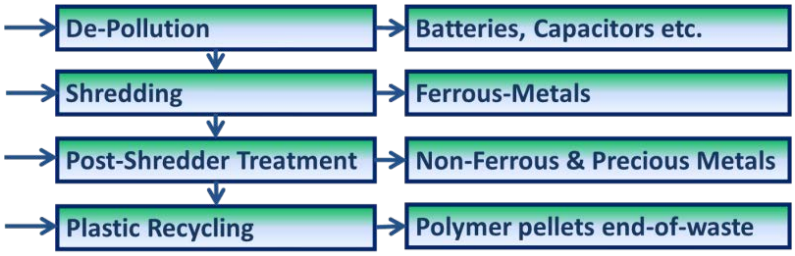
Metals and plastics from WEEE are finite resources, whose management, consumption and production call for a need to adopt a recycling economy. As the planet's mineral reserves are becoming less and less capable to respond to the exponential growth in demand, the legislative complexity for recycling seems to forget that improved rates of recycling are vitally important to a sustainable future; the recycling option should be recognized as an important strategy to keep a number of key resources in circulation.

The development of the WEEE recycling industry in Europe

After the introduction of the first WEEE directive in 2004, the recycling industry has shown to be very innovative in dealing with the challenges and targets set. The European WEEE recycling industry has been built upon an interesting and well considered guidance that was set by the Technical Adaptation Committee TAC (Annex II and article 6.1 of 2002/96):

"Substances, preparations and components may be removed manually, mechanically or chemically, metallurgically with the result that hazardous substances, preparations, and components and those mentioned in Annex II are contained as an identifiable stream or identifiable part of a stream at the end of the treatment process. A substance, preparation or component is identifiable if it can be (is) monitored to prove environmentally safe treatment."

The WEEE recycling industry developed on the basis of this definition and became a true "Urban Mining" industry in which economies of scale were needed to justify the major investments made to extract the mineral and plastic resources from the E-Waste.



The first step in the recycling process of the majority of WEEE is a de-pollution step in which a number of components are removed such as batteries, toner cartridges,large capacitors, mercury containing components, oils and ozone depleting gasses. After the de-pollution step the WEEE material is either manually dismantled or shredded in order recover the ferrous metals and to liberate the individual metal and plastic resources from the WEEE. When

shredded an ever increasing and innovative range of post-shredder technologies follows liberating ferrous and non-ferrous metals, including precious metals and rare earths, as well as plastics. All metal fractions are delivered to mainly large final-processing facilities, in which metallurgic and chemical processes are used to recover the ferrous and non-ferrous metallic resources. The plastics fraction is delivered to specialized WEEE plastic recycling facilities that separate the wide range of polymers into pure plastic flakes of recyclable plastics that subsequently are extruded (and compounded) to become 'end-of-waste' plastics. The non-recyclable plastics (incl. those with substances of concern such as Cadmium or Brominated Flame Retardants) are incinerated in appropriate incineration facilities to recover the energy. Depending on the type of E-Waste, like solar panels, also the glass is recovered.

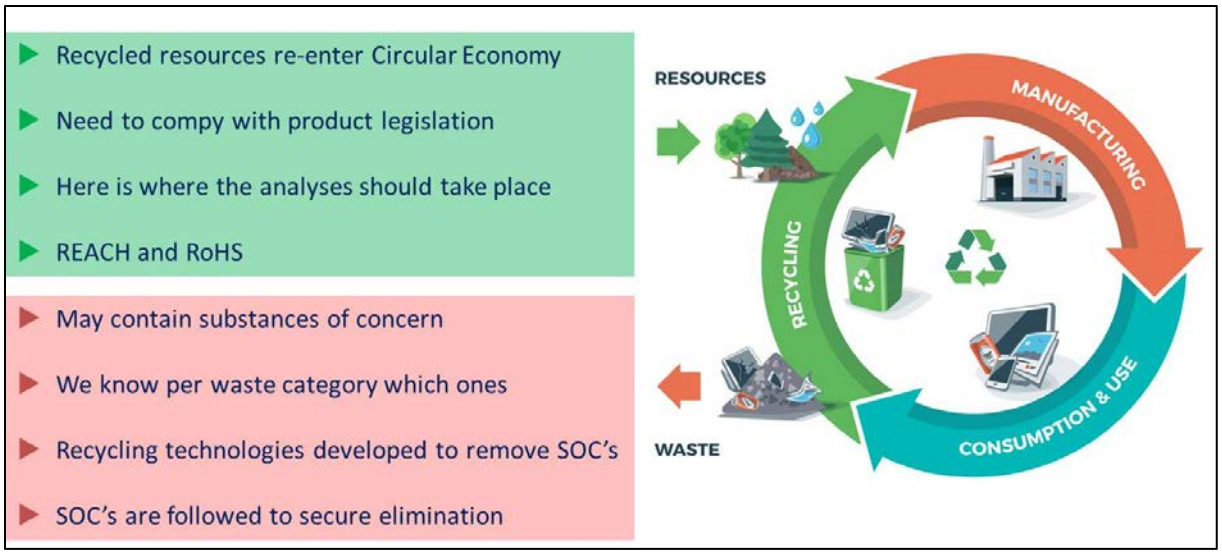
The recycling industry is regulated by a complex waste legislation and is faced with a large number of legal and permitting requirements to mitigate any environmental and health- and occupational safety risks. The presence of substances of concern within the various E-Waste products is well known. However the whereabouts of such products within a bulk E-waste stream, as it is now-a-days delivered to recyclers, is time consuming and pre-sorting of such products is practically impossible as this short film shows (click link).

The circular economy.

The stakeholder consultation starts with a clear description of the context of the Circular Economy Action plan (***Circular Economy Action Plan***: *"The promotion of non-toxic material cycles and better tracking of chemicals of concern in products will facilitate recycling and improve the uptake of secondary raw materials. The interaction of legislations on waste, products and chemicals must be assessed in the context of a circular economy in order to decide the right course of action at EU level to address the presence of substances of concern, limit unnecessary burden for recyclers and facilitate the traceability and risk management of chemicals in the recycling process. The Commission will therefore develop its analysis and propose options for action to overcome unnecessary barriers while preserving the high level of protection of human health and the environment. This work will feed into the future EU strategy for a non-toxic environment*).

Following the logic of the definition of the TAC meeting on how substances of concern that need to be removed and managed for *environmentally safe treatment*, it is clear that materials entering the recycling process can and will contain substances of concern.

Per WEEE category there is a thorough knowledge as to where these substances can be found and how they need to be removed. The recycling standards (WEEELabex and the Cenelec EN/TS 50625 standards) describe in detail how to deal with these substances and what limit values need to be achieved.



The scope of product and waste legislation in the circular economy.

After the recycling processes, which can be performed by a chain of individual companies and for which the recyclable materials might need to cross borders, the materials become either:

- secondary resources that are compliant with the product legislations or
- input material for thermal treatment such as incineration for energy or
- waste material to be discarded properly (incineration for organic content or landfill for mineral content)

In Europe consumer-relevant articles and products are covered by a wide range of regulatory requirements addressing the use of chemical substances in both production, thresholds of chemical substances in them, and the release of chemical substances from such articles and products. As a logical consequence any secondary raw materials that re-enter the Circular Economy need to be analysed to determine as to whether the material is compliant with these regulatory requirements.

The point of re-insertion of the secondary raw materials into the Circular Economy therefore is the only logic point where analyses are needed.

As to authorized substances, it will be impossible for recyclers to identify these in the incoming stream and to de-pollute the E-Waste of these authorized substances in a first step only approach, as outlined before.

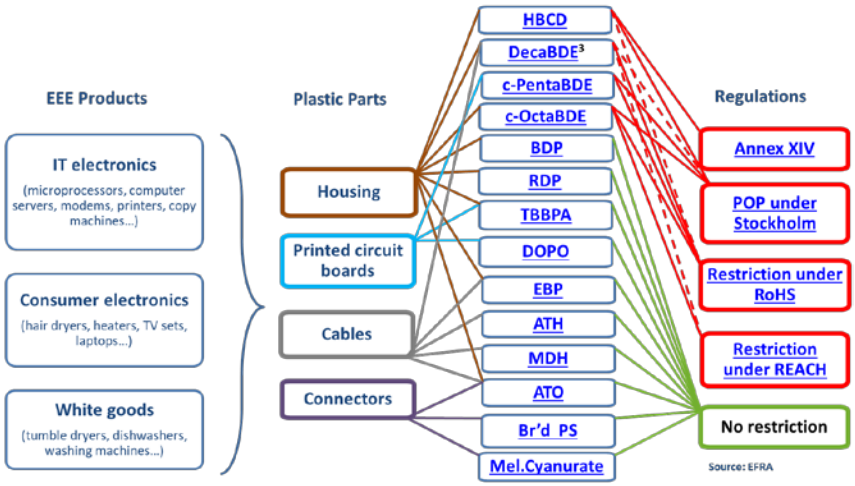
In summary it means that product legislation should not apply to waste stream but only on materials that result from recycling and that are being applied in new products.

The dynamic character of the Circular Economy

Plastics are on the list of priorities within the Circular Economy and the WEEE recycling industry is faced with frequent discussions around the group of brominated flame retardants. Brominated Flame Retardants (BFR's) are a large group of substances with a huge legal complexity.

Flame retardants have been used (and still are used) to reduce fire hazards in products that have internal heat sources, often prescribed by law or product standards.

Flame retardants can be found in various categories of electric and electronic products and within these categories they can be used in different parts of these products.



There are many types of flame retardant substances and each of these substances are either not restricted or in case that they are, they can be regulated differently as the graph shows. It is understandable that this complexity results in simplifications by authorities that have to deal with the enforcement of these restrictions. This often results in approaches like "all brominated flame retardants are bad", despite the fact that the many of the BFR substances in use are not restricted. The increasing tendency by authorities to apply product legislation on waste streams, like plastics containing BFR's, makes it necessary to sample WEEE streams that might contain such plastics. Analysing the individual brominated flame retardant substances or congeners takes time and is very expensive. The impossibility to take a representative sample from a mixed E-Waste bulk stream to get reliable data should be taken into account.

Furthermore competent authorities dealing with the transboundary shipments of wastes often make different own interpretations on what is required with respect to waste streams of EEE.

Here are three recent concrete cases:

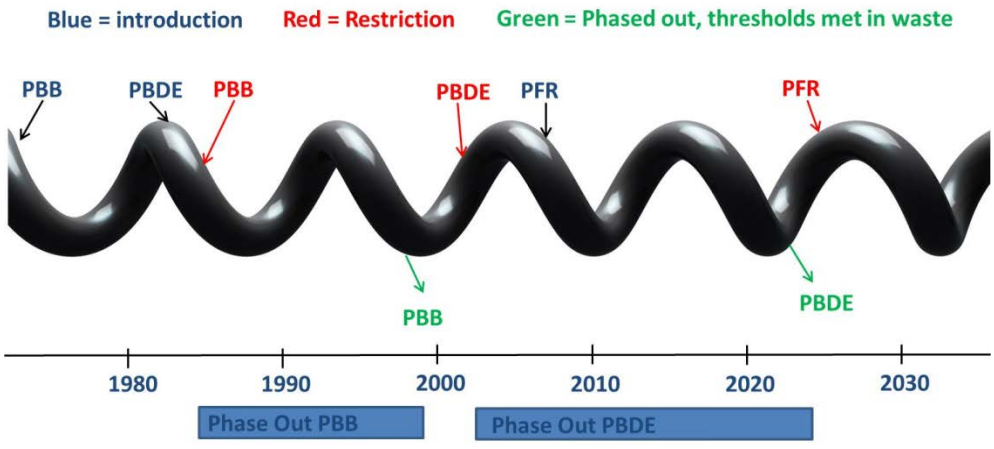
> **Case 1**: Since the last COP 2017 meeting in Geneva, in which Deca-BDE was listed as POP, we have been faced with a number of competent authorities, particularly Germany, that suddenly define plastics with risks to contain Deca-BDE as "hazardous waste". Interestingly most plastics recycling plants do not have permits to accept hazardous wastes. And this means that WEEE plastics from these regions cannot be recycled by these compliant European facilities. As consequence these plastics will almost certainly be traded for export out of Europe.

Case 2: Also in Germany several competent authorities requested E-Waste recyclers to submit a RoHS analysis of the plastic rich fraction of the E-Waste to check on its hazardousness. RoHS is a product-legislation and not a waste legislation. As a consequence the waste was classified as hazardous (>1000 ppm led) as the analysis understandably showed a non-RoHS compliant material. No export was possible to a plastic recycling plant without permit to take in hazardous waste and the result is the same as in case 1.

Case 3: In France the minister of environment requested to be very stringent about plastics that might contain POP listed brominated flame retardants. The French proposal insists on the incineration of all WEEE plastics that might contain POP brominated flame retardants (see Annex 1). This case shows that it is assumed that plastics recycling facilities cannot separate plastics with brominated flame retardants from those without, which clearly is a mistake. A similar argumentation is noted to come from some authorities in Germany. Especially Germany will remember the recent case of HBCDD in EPS foams that has resulted in some serious market disturbances, as suddenly large volumes of high calorific material needed to be incinerated. The incineration of plastics has its own market dynamics. The high caloric value of plastics imposes constraints on the throughput and capacity of incinerators resulting in 1,5 – 2 x, if not higher costs for incineration compared to normal waste streams. Incineration capacities might therefore not even suffice for this extra volume of high calorific input.

As a consequence of the differing interpretations of the EU legislations, the cross border traffic with WEEE plastics fractions is extremely difficult and in some cases even impossible. Compliant EU WEEE plastics recyclers, able to remove substances of concern such as brominated flame retardants, thus have difficulties in sourcing material for recycling and consequently illegal export of these fractions to locations outside the EU is stimulated and for this reason investors hesitate to build more recycling capacities in the European Union. This clearly counteracts the development of a Circular Economy and implies serious risks with regards to reaching the recycling targets set for WEEE.

Another element is that the legislation with regards to substances of concern is changing over time. The Circular Economy is not a static circle in which



materials flow, but it is much more like a spiralling economy in which new substances are phased in, become replaced or restricted, after which they need to be phased out and so forth.

The history shows that it is possible to completely phase out substances of concern. One of the best examples in the area of brominated flame retardants is the group of the PBB's (Polybrominated Biphenyls with 11 species/CAS numbers). This group of brominated flame retardants cannot be found in E-Waste material anymore and therefore has successfully been phased out.

PBB's were replaced by the group of the Polybrominated Diphenyl-Ethers, which substance group initially was banned, at least for electronics in Europe, with the first version of the RoHS directive. The recycling industry is capable of producing RoHS compliant plastics with PBDE levels of max 1000 ppm from WEEE plastics, thereby reducing the original concentration in plastics with more than 90 %.

Deca-BDE was given an exemption for the use in automotive spare parts and EERA is of the opinion that as long as this kind of exemptions are made for the use of substances like Deca-BDE, there should at least be similar exemptions for recycling.

With the ban on a large number of halogenated flame retardants, EERA now sees a development towards phosphoric based flame retardants. Today there is very little experience with these substances at the end-of-life of electronics, but it is not excluded that this group of substances will equally get restricted at some moment in time in the future.

In other words, the Circular Economy is not static and this time perspective will need to be considered when interfacing chemistry, product and waste legislation.

Clear views on End-of-Waste criteria for PCR WEEE plastics are missing.

There are no clear views about the end-of-waste status of recycled materials and more particularly about recycled plastics. Recyclers consider the recycled plastics to have reached end-of-waste status if the material is RoHS (for use in electronics) and/or REACH compliant (for use in other - non-food contact and non-toy - applications) in terms of defined legacy substances.

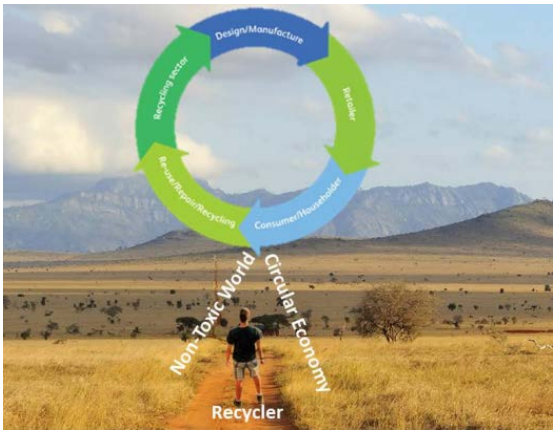
OEM Producers of Electronic products cannot procure waste products as they are not permitted as waste treatment companies.

This results in an incoherent and confusing situation with regards to the end-of-waste status, particularly of the produced Post-Consumer-Recycled WEEE plastics and EERA calls for clearer and simpler rules for End-of-Waste status.

Conclusions.

EERA of course supports the concept of removing hazardous substances from the WEEE waste stream and the WEEE recycling industry lives this concept since the introduction of the first WEEE Directive, based upon a clever and practical definition as to how recyclers have to deal with the substances of concern.

Technology is available to produce secondary raw materials made from WEEE that meet current product legislations.



However legal initiatives and thresholds for particular substances change continuously. If product legislation is going to define threshold levels that are going to be lowered to levels that the recycling industry cannot match, particularly plastics from WEEE might become unrecyclable and need to be discarded as a whole as a consequence.

This would make it impossible for the recycling industry to match the recycling and recovery targets set for WEEE in Europe, it would be in complete contradiction with the objectives of the development of a Circular Economy and it would result in immensely increased energy consumption and much higher CO_2 emissions, and would make the depletion moment of many mineral resources come faster.

The current legislative framework for waste is very complex already; overlaying the legislative waste framework with product legislation would make recycling practically unworkable.

Product legislation should apply for articles and substances that are inserted into the Circular Economy, including secondary raw materials. In some cases exemptions will need to be formulated, particularly in cases where substances are authorized by REACH for use in primary materials, articles and substances.

EERA thus calls for an interaction of legislations on waste, products and chemicals that creates a balance between Climate Change, Depletion and Non-Toxics considerations that stimulates the recycling industry as major contributor in the development of a true Circular Economy.

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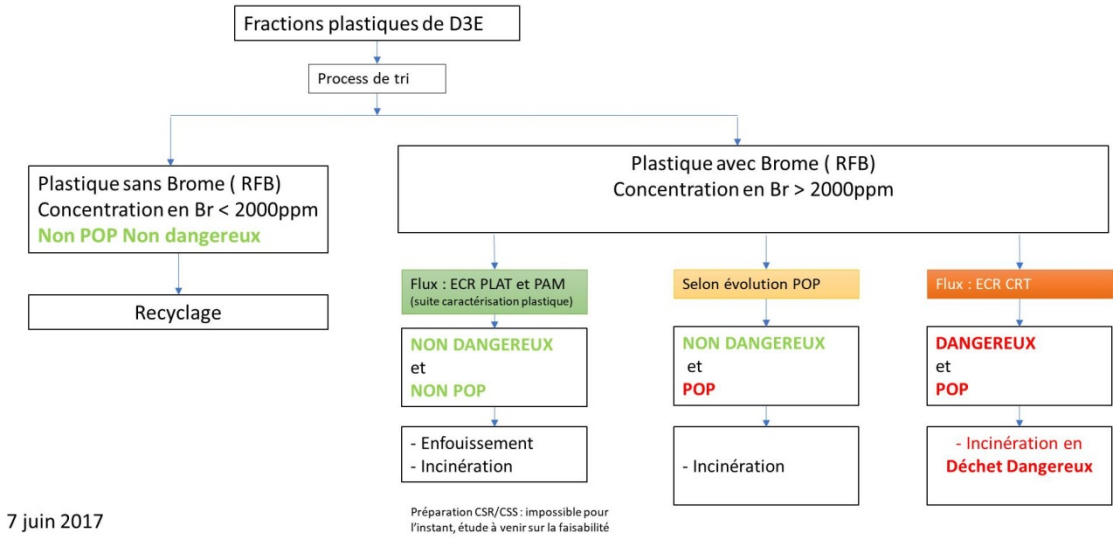
Annex 1 - French proposal to deal with WEEE plastics with BFR's



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