



European Union Network for the Implementation
and Enforcement of Environmental Law

WEEE Directive Implementation and Enforcement

Brominated Flame Retardants in WEEE plastic

Date of report:

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Introduction to IMPEL

The European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL) is an international non-profit association of the environmental authorities of the EU Member States, acceding and candidate countries of the European Union and EEA countries. The association is registered in Belgium and its legal seat is in Brussels, Belgium.

IMPEL was set up in 1992 as an informal Network of European regulators and authorities concerned with the implementation and enforcement of environmental law. The Network's objective is to create the necessary impetus in the European Community to make progress on ensuring a more effective application of environmental legislation. The core of the IMPEL activities concerns awareness raising, capacity building and exchange of information and experiences on implementation, enforcement and international enforcement collaboration as well as promoting and supporting the practicability and enforceability of European environmental legislation.

During the previous years IMPEL has developed into a considerable, widely known organisation, being mentioned in a number of EU legislative and policy documents, e.g. the 7th Environment Action Programme and the Recommendation on Minimum Criteria for Environmental Inspections.

The expertise and experience of the participants within IMPEL make the network uniquely qualified to work on both technical and regulatory aspects of EU environmental legislation.

Information on the IMPEL Network is also available through its website at: www.impel.eu



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<p>Project Manager/Authors:</p> <p>Walter Pirstinger (Austria)</p> <p>Marina de Gier (Netherlands)</p> <p>Participants see ToR Annex IV</p>	<p>Report adopted at IMPEL General Assembly Meeting:</p> <p>Total number of pages: 25</p> <p>Report: 15</p> <p>Annexes: 10</p>
<p>Executive Summary</p> <p>Waste of electrical and electronic equipment (WEEE) is one of the fastest growing waste streams in the EU, with some 12,3 Mt (16,6 kg/inh) generated in the EU 2016 (and 44,7 Mt worldwide), and expected to grow to more than 52,2 Mt in 2021 worldwide (The global E-waste Monitor UNU-IAS, 2017).</p> <p>WEEE contains a complex mixture of materials and components, which are partly hazardous. Not properly managed WEEE can cause major environmental and health problems. In addition, the production of electronics requires the use of scarce and expensive resources. The improvement of collection, treatment and recycling and avoiding illegal export (to countries with poor treatment facilities) of electronics at the end of their life is essential to contribute to a circular economy.</p> <p>For the year 2017 and 2018 is chosen to focus this project on brominated flame-retardants in WEEE plastic, on Annex VI of the WEEE Directive (minimum requirements for shipments) and the classification of WEEE.</p> <p>In 2017 two questionnaires have been send out to the participants, one on Annex VI and one on BFRs. In June 2017 a workshop was held in the Netherlands to discuss the outcome of the questionnaires and to present and discuss best practises. In 2018 another workshop was held, discussing BFRs in WEEE plastic, a draft guideline on the inspections of Annex VI of the WEEE Directive, and a draft document on the classification of WEEE.</p>	



In this report on 2018, we will focus on BFRs in WEEE plastic. There will be separate guidance documents on Annex VI and the classification of WEEE.

Conclusions and recommendations BFRs in 2018

In 2018, a workshop was held in which best practices for inspection, detection methods and thresholds for BFRs were discussed. For many countries inspection on BFRs in WEEE is very complicated and not often done.

To improve this situation the following steps could be considered:

- a common understanding on classification of BFR containing WEEE plastic;
- binding threshold for all BFRs (including DecaBDE);
- list of detections methods for BFRs for Bromine alternatively;
- new waste code for plastic containing BFRs;
- clear steps how plastics containing BFRs should be derived from waste stream at WEEE treatment operator or at subsequent steps (e.g. requirements in Austria);
- obligation for waste treatment companies to report the removal and the treatment of WEEE plastic containing BFRs.

Disclaimer

This report is the result of a project within the IMPEL network. The content does not necessarily represent the view of the national administrations or the Commission.



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Introduction

1.1 Background

Waste of electrical and electronic equipment (WEEE) is one of the fastest growing waste streams in the EU, with some 12,3 Mt (16,6 kg/inh) generated in the EU 2016 (and 44,7 Mt worldwide), and expected to grow to more than 52,2 Mt in 2021 worldwide (The global E-waste Monitor UNU-IAS, 2017).

The new WEEE Directive (2012/19/EU of the European Parliament and the Council of 4 July 2012 on waste electrical and electronic equipment) introduces a collection target of 45% of electronic equipment sold that will apply from 2016 and, as a second step from 2019, a target of 65% of equipment sold, or 85% of WEEE generated. The new collection targets agreed will ensure that around 10 million tons, or roughly 20kg per capita, will be separately collected from 2019 onwards. Article 11 (in combination with annex V) sets the recycling targets for the different product categories.

WEEE contains a complex mixture of materials and components, which are partly hazardous. Not properly managed WEEE can cause major environmental and health problems. In addition, the production of electronics requires the use of scarce and expensive resources.

The improvement of collection, treatment and recycling and avoiding illegal export (to countries with poor treatment facilities) of electronics at the end of their life is essential to contribute to a circular economy.

For the year 2017 and 2018 is chosen to focus this project on brominated flame-retardants in WEEE plastic, Annex VI of the WEEE Directive (minimum requirements for shipments) and classification of WEEE.

For Annex VI and classification separate guidance documents will be developed. This report is on BFRs in WEEE plastic. This report is follow up of the report of 2017.



1.2 Aims

This project has two main aims/parts:

1. Improving the enforcement of illegal shipments of WEEE to countries with poor treatment facilities (African and Asian countries) by creating a guideline for a more uniform interpretation and enforcement of Annex VI of the WEEE Directive.

Annex VI of the WEEE Directive gives Member States tools to fight illegal export of waste more effectively. Annex VI requires exporters to test and provide documents on the nature of their shipments when the shipments run the risk of being waste. Although Annex VI gives more tools, there are still elements which Member States can interpret (e.g. when is testing done properly, classification) and enforce differently. Different interpretation and enforcement will cause effects like port hopping and discussions on return shipments.

2. To prevent next generation of hazardous wastes by using waste plastics contaminated with PBDEs and PBBs for new plastic products (see requirements of the POP-Regulation and ROHS).

A desk study is necessary on the implementation of the WEEE Directive in national legislation concerning treatment of waste plastic containing brominated flame-retardants (BFR). Furthermore improving the monitoring of waste plastics of WEEE containing BFR, stimulate enforcement actions in this field by exchanging information, working methods, case studies. The main aim is to prevent next generation of hazardous wastes by using waste plastics contaminated with PBDEs and PBBs for new plastic products (see requirements of the POP-Regulation and ROHS).

Reading Guide

Chapter 2 is on the applicable legal requirements regarding BFRs in WEEE plastic. Chapter 3 contains the outcome of the workshop in 2018 and Chapter 4 contains the main conclusion and recommendations



Legal requirements

2.1. Introduction

WEEE contains a whole range of hazardous substances such as heavy metals and POPs (BFRs) in significant quantities. The uncontrolled release of those substances during disposal and recycling may cause risks to human health and environmental problems.

In the mid-1990s, about 150.000 tons of BFRs were produced annually. By the end of the 1990s the produced amount had almost doubled.

2.2. Legal requirements

Regarding BFRs in WEEE plastic, the following legislation is applicable:

DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS recast)

Restricted substances referred to in Article 4(1) and maximum concentration values tolerated by weight in homogeneous materials (ANNEX II)

- PBDE, PBB < 1.000mg/kg
- PBB < 50 mg/kg according to WSR/BC hazardous waste and subject to the procedure of prior written notification and consent, export prohibition to NON-OECD countries

DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE)

- annex VI: Minimum requirements for shipments
- plastic containing brominated flame retardants have to be removed from any separately collected WEEE
- these substances, mixtures and components shall be disposed of or recovered in compliance with Directive 2008/98/EC



COMMISSION REGULATION (EU) No 1342/2014 of 17 December 2014 amending Regulation (EC) No 850/2004 of the European Parliament and of the Council on persistent organic pollutants as regards Annexes IV and V (POP)

- annex IV: Hexabromobiphenyl – low POP limit: 50 mg/kg, sum of tetra-/penta-/hexa- and heptabromodiphenyl ether – low POP limit: 1.000 mg/kg

Art 7 (2): waste consisting of, containing or contaminated by any substance listed in Annex IV shall be disposed of or recovered, without undue delay and in accordance

- with Annex V, part 1 in such a way as to ensure that POP content is destroyed or irreversibly transformed so that the remaining waste and releases do not exhibit the characteristics of persistent organic pollutants.
- decabromodiphenyl ether (DecaBDE) is POP yet, but no limit value exists up to now

COMMISSION DECISION of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council

There is no reference to the low POP limit value for PBDEs (and some other newly listed POPs), except as regards hexabromobiphenyl, for the classification as hazardous waste.

Member States shall specify limit values for classification as hazardous waste at national level. In case of PBDEs, some MS either refer to the low POP-limit values, others to the chemical characteristics of the specific POP, triggering a hazardous property in the meaning of Regulation No. 1357/2014.

In Finland's view, it is not possible to specify limit values for hazardous waste at national level as they are set down by EU legislation.



Outcome workshop 2018

3.1 Problems identifying BFRs

Each year some 3 million tons of plastics are used in new Electric and Electronic Equipment (EEE) in Europe. In the separately collected Waste of Electric and Electronic Equipment (WEEE) many different types of plastics can be found.

The most common are HIPS, ABS, PP and PC-ABS. These plastics may contain Brominated Flame Retardants (BFRs) and several of the BFRs are restricted according to international and national legal requirements.

Plastics with BFRs are typically used in appliances that generate heat such as CRT televisions and monitors, printed circuit boards in IT equipment, printers and cables and connectors.

Although all of the MS have implemented the legal requirements to national law there are considerable differences in classification of BFR-containing WEEE plastic e.g. not listed, Annex IV, Annex III, hazardous or not hazardous waste. There is lack of common understanding how regulators should implement technical requirements of Annex VII of WEEE Directive (e.g. in permits or national legislation concerning BFRs plastics separation). This creates an obstacle both for operators and authorities (and thus for inspections). Furthermore there is no common understanding on the threshold of restricted BFRs and on the best method(s) to detect BFRs in WEEE plastics.

The basic cause of differences seems to be due to the European legislation itself – different Regulations (POPS, REACH) and Directives (RoHS) or conventions (Stockholm) regulate POPs and BFRs. It is difficult to orientate in the diversity of different legislation.

It is also fact that competent authorities do not prioritize enforcement and inspections to detect illegal treatment/shipments of WEEE plastics containing BFRs and in consequence of the competent authorities have only minor experience on how to inspect BFRs in WEEE plastic.

The lack of own waste codes for waste plastics containing BFRs and the unclear situation in classification whether or not waste plastics containing BFRs are to be classified as hazardous waste are reasonable factors that the data about produced, treated or shipped amounts of BFR-containing WEEE plastic are poor or even do not exist.



3.2 Some best practices

Detection methods

Because the identification of PBDE congeners using gas chromatography combined with mass spectrometry (GC/MS) is time consuming and rather expensive X-ray fluorescence (XRF) may help to overcome this obstacle.

By using XRF (also XRF handheld devices) the content of Bromine in WEEE plastics can be determined with sufficient precision as well as accuracy.

Threshold for BFRs/Br

EN standard CLC/TS 50625-1 on collection, logistics & treatment requirements for WEEE - Part 1 sets a threshold value for total elemental Bromine - Br of 2.000 ppm for the check if there are BFRs in plastics.

WEEE plastics containing a total bromine content below 2000 ppm Br are classified as POP free according to this standard. On the other hand, if the content of Bromine exceeds 2000 ppm, it is assumed that restricted BFRs are present and a separation and a further treatment (e.g. incineration) is required.

In the near future, the limit of 2000 ppm Br will require an adjustment when a POP-limit for DecaBDE will be set.

It has been suggested that either the limit for Deca-BDE would be 10 ppm or the total limit for tetra-, penta-, heksa-, hepta and deca-BDE would be 500 ppm.

This means that the CENELEC BFR-standard has to be revised in both cases.

Legal adjustments

Germany prepares an ordinance for the treatment of WEEE. By this ordinance the existing treatment requirements for WEEE according to the national ElektroG will be concretized and developed further also in the field of the treatment of BFRs containing WEEE plastics.

In Austria, the national Waste Treatment Obligations Ordinance was amended recently. By this ordinance, the following provisions are laid down:

- WEEE plastics destined for material recycling which are not doubtless free of BFRs (**Br < 2000 ppm**) have to be separated. The separation must be ensured by means of a **quality assurance system** and



- if other validated methods do not ensure that the plastic fractions are free of BFRs a **continuous measurement** of total bromine content must be made (including a continuous recording of the analysis results);
- no analysis of the total bromine content of WEEE plastics is needed if the **entire plastic fraction will incinerated** or the BFRs will be demonstrably separated quantitatively (e.g. by floating-sink procedure in combination with near infrared (NIR) and X-ray transmission technology) before their destruction.

Finland: A survey of BFRs in WEEE and waste vehicles will be performed. The focus will be on how the restrictions have been implemented.

Netherlands: Set up an enforcement plan on BFR in which NL set out how they could enforce. However, there is no validated method to analyze the few specific BFR limit values of POP.

Inspections

In Austria, trained experts sometimes do spot checks of bromine content of WEEE plastics with XRF ("handheld"). In Czech Republic trained experts has the possibility to carry out spot checks on Br content. Due to unclear legal context the checks on Br have not been carried out at WEEE operators.

Austria: During road/company inspections, only trained experts take samples in compliance with EN standards for sampling.

Austria: Some inspections at WEEE plastics treatment facilities (Producer of high-grade plastic granulates and flakes). Waste samples (shredded WEEE plastics classified as green listed waste) from loads of just incoming trucks from abroad were taken by trained experts. Results of analysis showed Bromine contents > 2000 ppm for all samples. Wastes have to classify as not listed waste (notification). Consignees and senders were reported for illegal shipments of waste to the administrative and criminal court respectively. Up to now one final sentence was imposed.

Leaflet/Awareness raising

European Electronics Recyclers Association (EERA) published a brochure which describes how WEEE recyclers treat mixed plastics with Best Available Technology in compliance with WEEE and POP regulation.

Leaflet includes also:

- facts and figures about BFRs containing plastics;
- treatment scheme how to detect, separate and treat WEEE plastics containing BFRs
- EN Standard 50625-1 on collection, logistics & treatment requirements for WEEE – general treatment requirements in case total Bromine content > 2000ppm;
- Br > 2000ppm: further separation by specialized recycling facilities and incineration of this fraction.



Conclusions and recommendations

In 2018 a workshop was held in which best practices for inspection, detection methods and thresholds for BFRs were discussed. For many countries inspection on BFRs in WEEE is very complicated and not often done.

To improve this situation the following steps could be considered:

- a common understanding on classification of BFR containing WEEE plastic;
- binding threshold for all BFRs (including DecaBDE);
- list of detections methods for BFRs for Bromine alternatively;
- new waste code for plastic containing BFRs;
- clear steps how plastics containing BFRs should be derived from waste stream at WEEE treatment operator or at subsequent steps (e.g. requirements in Austria);
- obligation for waste treatment companies to report the removal and the treatment of WEEE plastic containing BFRs.



Annexes



Annex I Terms of Reference

TOR Reference No.:	Author(s): Marina de Gier/Walter Pirstinger
Version: 1	Date: 2 november 2017
TERMS OF REFERENCE FOR WORK UNDER THE AUSPICES OF IMPEL	

1. Work type and title

1.1 Identify which Expert Team this needs to go to for initial consideration	
Industry	<input type="checkbox"/>
Waste and TFS	<input checked="" type="checkbox"/>
Water and land	<input type="checkbox"/>
Nature protection	<input type="checkbox"/>
Cross-cutting – tools and approaches -	<input type="checkbox"/>
1.2 Type of work you need funding for	
Exchange visits	<input type="checkbox"/>
Peer reviews (e.g. IRI)	<input type="checkbox"/>
Conference	<input type="checkbox"/>
Development of tools/guidance	<input checked="" type="checkbox"/>
Comparison studies	<input checked="" type="checkbox"/>
Assessing legislation (checklist)	<input checked="" type="checkbox"/>
Other (please describe):	<input type="checkbox"/>
Sharing best practises and giving feed back to the Commission regarding implementation and enforcement difficulties	<input checked="" type="checkbox"/>
1.3 Full name of work (enough to fully describe what the work area is)	
<p>Improving the implementation and enforcement of the WEEE-Directive. The focus of this project will be on:</p> <ul style="list-style-type: none"> • Annex VI of the WEEE Directive, developing an uniform enforcement strategy; • To share knowledge on how to deal with the hazardous substances (BFRs) in WEEE in relation to recycling with a focus on the role and possibilities for enforcement authorities; • Classification of E-Waste, making an overview how WEEE is classified and developing an uniform guideline on classification. 	



1.4 Abbreviated name of work or project

WEEE implementation and enforcement

2. Outline business case (why this piece of work?)

2.1 Name the legislative driver(s) where they exist (name the Directive, Regulation, etc.)

European Waste Shipment Regulation (EC) No 1013/2006

- *The enforcement activities are based on the EC Regulation (EC) No 1013/2006 on the supervision and control of shipments of waste within, into and out of the European Community. This is directly applicable in all Member States of the EU. Article 50 requires Member States to enforce the regulation and to check shipments and to cooperate bilaterally or multilaterally with one another in order to facilitate the prevention and detection of illegal shipments. The “revised burden of proof” has been laid down.*
- *According to the Regulation (EU)660/2014 from 16 May 2014 amending WSR 1013/2006 member states shall cooperate bilaterally and multilaterally in one another to facilitate the prevention and detection of illegal shipments.*

Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

- *The available evidence indicates that measures on the collection, treatment, recycling and disposal of waste electrical and electronic equipment (WEEE) as set out in Directive 2002/96/EC of 27 January 2003 of the European Parliament and of the Council on waste electrical and electronic equipment (6) are necessary to reduce the waste management problems linked to the heavy metals concerned and the flame retardants concerned. In spite of those measures, however, significant parts of WEEE will continue to be found in the current disposal routes. Even if WEEE were collected separately and submitted to recycling processes, its content of mercury, cadmium, lead, chromium VI, PBB and PBDE would be likely to pose risks to health or the environment.*

DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS recast)

- *Restricted substances referred to in Article 4(1) and maximum concentration values tolerated by weight in homogeneous materials (ANNEX II)*



Polybrominated biphenyls (PBB) (0,1%)

Polybrominated diphenyl ethers (PBDE) (0,1%)

Remark: According to European Waste Shipment Regulation (EC) No 1013/2006 and Basel Convention respectively wastes, substances and articles containing, consisting of or contaminated with polychlorinated biphenyl (PCB), polychlorinated terphenyl (PCT), polychlorinated naphthalene (PCN) or **polybrominated biphenyl (PBB)**, or any other polybrominated analogues of these compounds, at a **concentration level of 50 mg/kg or more** are classified as hazardous wastes (subject to the procedure of prior written notification and consent, export prohibition to NON-OECD countries).

DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE)

- *Annex VI: Minimum requirements for shipments*
- **plastic containing brominated flame retardants have to be removed from any separately collected WEEE**
- *These substances, mixtures and components shall be disposed of or recovered in compliance with Directive 2008/98/EC*

COMMISSION REGULATION (EU) No 1342/2014 of 17 December 2014 amending Regulation (EC) No 850/2004 of the European Parliament and of the Council on persistent organic pollutants as regards Annexes IV and V (POP)

- *Annex IV: **Hexabromobipheny – low pop limit: 50 mg/kg, sum of tetrabromodiphenyl ether, pentabromodiphenyl ether, hexabromodiphenyl ether and heptabromodiphenyl ether – low POP limit: 1000 mg/kg***

*Art 7 (2): waste consisting of, containing or contaminated by any substance listed in Annex IV **shall be disposed of or recovered, without undue delay** and in accordance*

- *with Annex V, part 1 in such a way as to ensure that **the persistent organic pollutant content is destroyed or irreversibly transformed** so that the remaining waste and releases do not exhibit the characteristics of persistent organic pollutants.*

Remark: Up to now **decabromodiphenyl ether** is no POP yet, but is already mentioned on a candidate list for "new" POPs under the Stockholm Convention.



CENELEC - CLC/TS 50625-3-1

COLLECTION, LOGISTICS & TREATMENT REQUIREMENTS FOR WEEE - PART 3-1: SPECIFICATION FOR DE-POLLUTION - GENERAL

For the plastics fractions the substances to be investigated and the limits are one of the following according to the treatments performed on plastics:

- *plastics fractions declared as without BFR: **2000 ppm of Bromine** (Annexes C and D);*
- *BFRs in plastic fractions without restricted BFRs: **1000 ppm of restricted BFRs** (Annexes C and D);*

It is assumed that plastics from WEEE containing less than 2000 ppm of Bromine do not contain POP-PBDEs. Nevertheless, they may contain Deca-BDE, which is no POP yet.

COMMISSION DECISION of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council

Wastes containing polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF), DDT (1,1,1-trichloro-2,2-bis (4-chlorophenyl)ethane), chlordane, hexachlorocyclohexanes (including lindane), dieldrin, endrin, heptachlor, hexachlorobenzene, chlordane, aldrin, pentachlorobenzene, mirex, toxaphene, **hexabromobiphenyl** and/or PCB exceeding the concentration limits indicated in Annex IV to Regulation (EC) No 850/2004 of the European Parliament and of the Council (1) shall be classified as hazardous.

Note: **There is no reference to the low POP limit value for PBDEs** (and some other newly listed POPs), except as regards hexabromobiphenyl, for the classification as hazardous waste. Member States shall specify limit values for classification as hazardous waste at national level. In case of PBDEs some EU Member States either refer to the low POP-limit values, others to the chemical characteristics of the specific POP, **triggering a hazardous property in the meaning of Regulation No. 1357/2014.**

The Basel Convention and in particular: The draft technical guidelines on transboundary movements of electrical and electronic waste and used electrical and electronic equipment, in particular regarding the distinction between waste and non-waste under the Basel Convention

2.2 Link to IMPEL MASP priority work areas

1. Assist members to implement new legislation	<input checked="" type="checkbox"/>
2. Build capacity in member organisations through the IMPEL Review Initiatives	<input type="checkbox"/>
3. Work on 'problem areas' of implementation indentified by IMPEL and the European Commission	<input checked="" type="checkbox"/>

2.3 Why is this work needed? (background, motivations, aims, etc.)

Background



1. Waste of electrical and electronic equipment (WEEE) is one of the fastest growing waste streams in the EU, with some 9 million tons generated in 2005, and expected to grow to more than 12 million tons by 2020.
2. WEEE contains a complex mixture of materials and components, which are partly hazardous. Not properly managed WEEE can cause major environmental and health problems. In addition, the production of electronics requires the use of scarce and expensive resources. Regarding hazardous substances in WEEE:
 - WEEE contains a whole range of hazardous substances such as heavy metals and POPs (BFRs) in significant quantities. The uncontrolled release of those substances during disposal and recycling may cause risks to human health and environmental problems.
 - In the mid-1990s, about 150.000 tons of BFRs were produced annually. By the end of the 1990s, the produced amount had almost doubled.
 - In order to limit the impact of hazardous substances to next generations of WEEE, legislative measures were taken within EU. RoHS (2002/95/EC) defines threshold values and stipulates the substitution for the use of some heavy metals and PBDEs and PBBs in new EEE produced for the EU market after July 1st 2006.
 - Maximum tolerable mass fractions for PBDEs and PBBs in (waste) plastics are 0.1 wt% (PBB <50mg/kg).
 - “Monitoring of WEEE plastics in regards to brominated flame retardants using handheld XRF” (Aldrian, Ledersteiger, Pomberger; Waste Management 36 (2015) 297-304) According to this study 3.000 pieces of black (TV) and 1.600 pieces of grey (PC) plastic waste were analysed with handheld XRF technique. The high percentage of pieces exceeding the legal limit values for PBDEs (15% for TV and 47% for PC waste plastics) emphasises the importance of constant monitoring of this waste stream to ensure compliance with legal provisions. The limit value for PBB (50 ppm) was never reached due the fact that these flame-retardants were not used for years.
 - Due to the extensive usage of BFRs in the recent decades the monitoring of waste plastics in WEEE or separated from WEEE (which are destined for recovery within EU/OECD and in NON-OECD countries) is obligatory.
3. The new Directive introduces a collection target of 45% of electronic equipment sold that will apply from 2016 and, as a second step from 2019, a target of 65% of equipment sold, or 85% of WEEE generated. The new collection targets agreed will ensure that around 10 million tons, or roughly 20kg per capita, will be separately collected from 2019 onwards. Article 11 (in combination with annex V) sets the recycling targets for the different product categories.
4. The improvement of collection, treatment and recycling and avoiding illegal export (to countries with poor treatment facilities) of electronics at the end of their life is essential to contribute to a circular economy.

This project has three main aims/parts:



1. Improving the enforcement of illegal shipments of WEEE to countries with poor treatment facilities (African countries) by creating a guideline for a more uniform interpretation and enforcement of Annex VI of the WEEE Directive.

Annex VI of the WEEE Directive gives Member States tools to fight illegal export of waste more effectively. Annex VI requires exporters to test and provide documents on the nature of their shipments when the shipments run the risk of being waste. Although Annex VI gives more tools, there are still elements which Member States can interpret (e.g. when is testing done properly, classification) and enforce differently. Different interpretation and enforcement will cause effects like port hopping and discussions on return shipments.

2. To carry out a desk study on the implementation of the WEEE Directive in national legislation concerning treatment of waste plastic containing brominated flame-retardants (BFR). Furthermore improving the monitoring of waste plastics of WEEE containing BFR, stimulate enforcement actions in this field by exchanging information, working methods, case studies. The main aim is to prevent next generation of hazardous wastes by using waste plastics contaminated with PBDEs and PBBs for new plastic products (see requirements of the POP-Regulation and ROHS).

Because the WEEE Directive is a Directive, the implementation in national regulation can differ among Member States. The Commission itself is already taking action to work on a uniform way of reporting. In this part of the project, we will share experience, best practices and the possibilities and impossibilities on how enforcement can benefit a more accurate reporting but also a positive contribution to more and better collection and recycling of WEEE. In this part of the project, we will also discuss the classification problems of WEEE and work on a more uniform interpretation. In addition, knowledge will be shared on how to deal with the hazardous substances in WEEE.

2.4 Desired outcome of the work (what do you want to achieve? What will be better / done differently as a result of this project?)

1. To work towards an adequate level of inspections in all Member States and a consistent level of enforcement regarding Annex VI of the WEEE Directive;
2. To work towards an adequate level of inspections in all Member States and a consistent level of enforcement regarding hazardous substances (BFR) in WEEE ;
3. Providing feedback to the Commission on the difficulties regarding implementation and enforcement difficulties;
4. More uniform system of classification.

2.5 Does this project link to any previous or current IMPEL projects. (state which projects and how they are related)

No (indirect to NCP Days and Enforcement Actions and the WEEE project 4 years ago)



3. Structure of the proposed activity

3.1 Describe the activities of the proposal (what are you going to do and how?)
<p>The scope of this project is quite broad. This project will take 2 or 3 years. In 2017, the focus was on Annex VI and BFR in WEEE plastic. The project in 2017 resulted in the next recommendations for the ToR 2018:</p> <ul style="list-style-type: none">• to develop a guideline on the testing of second hand electronic;• to develop an inspection plan regarding BFR in WEEE plastic and how WEEE is treated in the recovery facilities in different MS (WEEELABEX, CENELEC);• the classification of which electronic devices should be classified as hazardous or non-hazardous (and the codes which have to be used eg GC 010, GC 020 or A1180). <p>Activities 2018:</p> <ul style="list-style-type: none">• developing a guideline on Annex VI (testing requirements);• developing a first draft inspection plan on BFR in WEEE plastic: to be able to draft an inspection plan we first need a common understanding on the threshold for BFRs, detections methods for BFRs, responsible persons for removing/treating BFRs plastics etc.;• developing a guideline on the classification of WEEE.
3.2 Describe the products of the proposal (what are you going to produce in terms of output / outcome?)
<ul style="list-style-type: none">• Guideline Annex VI• Draft inspection plan on BFR in WEEE waste plastic• Guideline classification of WEEE• Report
3.3 Describe the milestones of this proposal (how will you know if you are on track to complete the work on time?)
<p>See under 3.2 the products.</p>
3.4 Risks (what are the potential risks for this project and what actions will be put in place to mitigate these?)
<p>The subject is quite broad, the implementation of the WEEE Directive differs among MS, also a lack of experience on how WEEE is treated in recover facilities in MS. To mitigate this risks the discussed topics will be focussed on specific issues.</p>



4. Organisation of the work

4.1 Lead (who will lead the work: name, organisation and country) – this must be confirmed prior to submission of the TOR to the General Assembly)
Co-lead By Austria and The Netherlands (Walter Pirstinger and Marina de Gier)
4.2 Project team (who will take part: name, organisation and country)
Austria: Walter Pirstinger Belgium: An van Steenbergem Croatia: Branimur Fuk Czech Republic: Martin Zemek Estonia: Rene Rajasalu Finland: Hannele Nikander Germany: Katherina Aiblinger-Madersbacher Iceland: Hólmfríður Þorsteinsdóttir Latvia: Inga Senavska Malta: Daniella Sammut Netherlands: Marina de Gier Norway: Beate Langset Poland: Gabriela Palian Portugal: Marta Ramos Romania: Stefan Koxsis Ludovic Slovenia: Ema Starbek Gregoric Spain: Manuel Salgado United Kingdom: Chris Garvie and Chris Grove
4.3 Other IMPEL participants (name, organisation and country)
4.4. Other non-IMPEL participants (name, organisation and country)

5. High level budget projection of the proposal. In case this is a multi-year project, identify future requirements as much as possible

	Year 1 (exact)	Year 2	Year 3	Year 4
How much money do you require from IMPEL?	13.460			
How much money is to be co-financed	1.000 (venue/lunch)			
Total budget				

6. Detailed event costs of the work for year 1



	Travel € (max €360 per return journey)	Hotel € (max €90 per night)	Catering € (max €25 per day)	Total costs €
Event 1	1800 (5x360)	900(5x2x90)		2700
<i>Projectteam (5 persons)</i>				
<i>March</i>				
<i>tbd</i>				
<i>6</i>				
<i>2</i>				
Event 2	20 x 360 7200	20x2x90 3600		10760
<i>workshop</i>				
<i>Oktober</i>				
<i>tbd</i>				
<i>20</i>				
<i>2</i>				
Event 3				
<i><Type of event></i>				
<i><Data of event></i>				
<i><Location></i>				
<i><No. of participants></i>				
<i><No. of days/nights></i>				
Event 4				
<i><Type of event></i>				
<i><Data of event></i>				
<i><Location></i>				
<i><No. of participants></i>				
<i><No. of days/nights></i>				
Total costs for all events				13460

7. Detailed other costs of the work for year 1

7.1 Are you using a consultant?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
7.2 What are the total costs for the consultant?	
7.3 Who is paying for the consultant?	



7.4. What will the consultant do?	
7.5 Are there any additional costs?	<input type="checkbox"/> Yes <input type="checkbox"/> No Namely:
7.6 What are the additional costs for?	
7.7 Who is paying for the additional costs?	
7.8. Are you seeking other funding sources?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Namely:
7.9 Do you need budget for communications around the project? If so, describe what type of activities and the related costs	<input type="checkbox"/> Yes <input type="checkbox"/> No Namely:

8. Communication and follow-up (checklist)

	What		By when
8.1 Indicate which communication materials will be developed throughout the project and when <i>(all to be sent to the communications officer at the IMPEL secretariat)</i>	TOR ✓ * Interim report ✓ * Project report ✓ * Progress report(s) ✓ Press releases News items for the website ✓ * News items for the e-newsletter Project abstract ✓ * IMPEL at a Glance ✓ Other, (give details):	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
8.2 Milestones / Scheduled meetings (for the website diary)			
8.3 Images for the IMPEL image bank	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		



8.4 Indicate which materials will be translated and into which languages	
8.5 Indicate if web-based tools will be developed and if hosting by IMPEL is required	
8.6 Identify which groups/institutions will be targeted and how	European Commission and Member States
8.7 Identify parallel developments / events by other organisations, where the project can be promoted	

^) Templates are available and should be used. *) Obligatory

9. Remarks

Is there anything else you would like to add to the Terms of Reference that has not been covered above?

*In case of doubts or questions please contact the
IMPEL Secretariat.*

*Draft and final versions need to be sent to the
IMPEL Secretariat in word format, not in PDF.*

Thank you.