February 2018

QUESTIONNAIRE

"*Study to Support the Review of Waste-related issues in Annexes IV and V of Regulation (EC) 850/2004*"[1]

1) Aim of the questionnaire

The following questionnaire has been prepared by BiPRO GmbH (part of Ramboll)[2] in close coordination with the European Commission. The questionnaire aims at gathering up-to-date information and quantitative data on Persistent Organic Pollutants (POPs) and more specifically on waste related issues of certain "new POPs", "candidate POPs" and "already listed POPs". The information will provide the EU Commission with the necessary scientific basis to propose amendments to the POP Regulation (EC) 850/2004 (hereafter called "POP Regulation"), due to the listing of new substances and to the review of concentration limits for substances already listed. In addition, the study shall provide guidance on how wastes containing the new POPs may be managed.

2) Background information

POPs are a group of organic compounds that possess toxic properties, persist in the environment, bioaccumulate through the food web and pose a risk to human health and the environment. POPs are transported across international boundaries far from their sources through air, water and migratory species.

The "Protocol to the regional UNECE Convention on Long-Range Transboundary Air Pollution" (CLRTAP) and the Global "Stockholm Convention" on POPs are international, legally binding instruments aiming to reduce and eliminate the production, use and releases of POPs in the territories of all participating parties. Both contain provisions on the environmentally sound management of wastes consisting of, containing or contaminated by POPs (hereafter called "POP waste").

Although substantial progress has been achieved in limiting the use and application of POPs and reduce their emission into the environment, there are ongoing releases into the environment as well as a constant cycling of substances released in the past. For an optimised approach to elimination, all sectors in the life cycle of a product and of anthropogenic emission sources need to be considered. In this framework, proper waste management can contribute substantially to the reduction of POP releases into the environment, and a comprehensive legislation on POP waste is a necessary pre-requisite.

The Stockholm Convention was implemented into EU Community law in 2004 by the POP Regulation. It foresees an obligation to generally destroy or irreversible transform the POP content

[1] Information related to this project on behalf of the European Commission is provided on a dedicated project website at http://pops-and-waste.bipro.de.

[2] BiPRO GmbH (part of Ramboll), Munich, Germany (www.bipro.de), has been contracted by the European Commission to carry out the "Study to support the review of waste-related issues in Annexes IV and V of Regulation (EC) 850/2004"

of waste above certain concentration limits (the 'low POP content'). In addition, in exceptional cases, waste above the limits may be otherwise managed with defined operations for specified waste types if destruction or irreversible transformation do not represent the environmentally preferable option and the concentration in such wastes are below another threshold (the 'high POP content').[3]

In 2017, the Conference of the Parties of the Stockholm Convention (SC) decided to add three new substances to the relevant Annexes. Every time a substance is listed as a POP by the SC, the parties have to reflect the listing in domestic legislation. The EU as a party to the Convention is requested to amend the POP Regulation by May 2018 to include these 'new POPs'.

In addition, three substances are currently under review procedures and are likely to be added to the list of POPs under the SC in the next years (the so- called “candidate POPs”). For the new POPs and the candidate POPs, there is a need to improve the knowledge basis regarding quantities that were used in the past, their concentrations and sources, as well as regarding aspects related to waste management in terms of disposal and recycling paths. This information is needed to assess possible disposal options and to establish concentration limits for waste[4]. Consequently, further analysis is needed for the following substances:

- **“new POPs”:** Decabromodiphenylether (decaBDE), short-chain chlorinated paraffins (SCCPs) and Hexachlorobutadiene (HCBD)
- **“candidate POPs”:** Dicofol, Pentadecafluorooctanoic acid (PFOA, perfluorooctanoic acid) and its salts and PFOA-related compounds, Perfluorohexanoic acid (PFHxS) and its salts and PFHxS-related compounds

Furthermore, new scientific information on three substances already listed in the annexes of the SC has raised the necessity of reviewing already established concentration limits. Therefore, the following substances require renewed analysis and, potentially adjustment of the concentration limits:

- **“already listed POPs”:** Hexabromocyclododecane (HBCD), Polychlorinated Biphenyls (PCB), Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF)

4) Instructions on using the questionnaire

Please note that some of the relevant questions might have already been addressed in requests for information under the SC or the Basel Convention (BC). Submissions from EU member states related to these requests for information will be reviewed and considered as appropriate for the purpose of the actual study.

The present questionnaire is provided as an MS-Word-file and it would be much appreciated to receive your responses using this electronic version. All questions are numbered and highlighted

[3] Article 7 of Regulation EC (No) 850/2004

[4] Note that for SCCPs and HCBD concentration limits are already established in the Annexes IV and V of the POP Regulation. Only for decaBDE new concentration limits need to be established.

in grey. All fields where input is desired are blue.

The questionnaire is structured in three main sections.

- **Section I – "new POPs":** decaBDE, SCCPs and HCBD
- **Section II – "candidate POPs":** dicofol, PFOA and PFHxS
- **Section III – "already listed POPs":** HBCD, PCB and PCDD/PCDF

Please only fill in the sections that you consider relevant and where you can provide specific information. Please provide specific references wherever possible and do not hesitate to also send us additional background information in form of documents, reports, data sets or as links to websites.

We recommend to quickly screen all questions of a section before starting to fill in the information. If a question is unclear or if you desire to discuss a certain aspect, please do not hesitate to contact one of the following contact persons of the project team:

Contact person	E-mail address	Telephone
Mr Alexander Potrykus	apot@ramboll.com	+49 89 978970-100
Mr Milos Milunov	mo@ramboll.com	

All information provided will be used in a transparent and traceable way for the present study. Provided that your agreement is expressed below, submitted non-confidential information will be published on the dedicated project related website[5]. If you wish to submit information on a confidential basis, please indicate this in your response. Any confidential information will only be used in anonymous or aggregated form.

Please indicate in the following table whether you agree with the publication of your answers to the Questionnaires:

Section		Y/N
I.I	Occurrence of "new POPs" decaBDE, SCCPs and HCBD	
I.II	Recycling Operations/Waste Management Options for "new POPs"	
I.III	Concentration Limits for decaBDE, SCCPs and HCBD	
II.I	Occurrence of "candidate POPs" Dicofol, PFOA and PFHxS	
II.II	Recycling Operations/Waste Management Options for "candidate POPs"	
II.III.	Concentration Limits for dicofol, PFOA and PFHxS	

[5] http://pops-and-waste.bipro.de

III	Already listed POPs	

Please return the completed questionnaire and any related documents to popwaste2018@ramboll.com before 29 March 2018.

In case you are rather interested to discuss with us by telephone, please let us know when we could reach you.

Name of Institution: European HBCD Industry Group & EUMEPS
Country: _____
City/ CIP Code: _____
Street: _____
Contact person: Dr. Smadar Admon, Chair of the European HBCD Industry Group
E-mail: smadar.admon@icl-group.com
Phone: +972-4-846-9302

Remark: The HBCD Industry Group & EUMEPS are available to discuss by phone the low POP limits for HBCD

The European HBCD Industry Group gathers HBCD producers and users in the polystyrene insulation foam sector, the major application of HBCD. The HBCD producers are represented by BSEF (the International Bromine Council) and the HBCD users in the polystyrene insulation industry are members of PlasticsEurope (for expandable polystyrene) and Exiba (for extruded polystyrene).

The European Manufacturers of Expanded Polystyrene (EUMEPS) is an association which supports and promotes the European EPS industry through National Associations. It is divided into two interest groups, reflecting the main applications for Expanded PolyStyrene (EPS): Packaging and Building & Construction. Membership of EUMEPS is open to the National Associations, raw material producers and multinational converters of EPS.

Section I – "new POPs"

Decabromodiphenylether (decaBDE); short-chain chlorinated paraffins (SCCPs); Hexachlorobutadiene (HCBD)

I. Occurrence of "new POPs" decaBDE, SCCPs and HCBD (articles in use, waste, recycled articles as well as (production) processes and unintentional releases)

1. *a) Please indicate whether your country /company has* ***stockpiles of decaBDE, SCCPs or HCBD.***

b) ***If yes,*** *please provide information on types, quantity, concentrations, etc.*

a)

b)

2. *Please indicate any known* ***occurrence and concentration of the "new POPs" decaBDE****,* ***SCCPs and HCBD*** *in different* ***articles in use, waste*** *categories* ***and recycled articles****.*

decaBDE	Specification of waste/article	Concentration [mg/kg]
Articles in use		
Wastes		
Recycled articles		
SCCPs	Specification of waste/article	Concentration [mg/kg]
Articles in use		
Wastes		
Recycled articles		
HCBD	Specification of waste/article	Concentration [mg/kg]
Articles in use		
Wastes		
Recycled articles		

Remarks:

3. *Please provide i**nformation on quantities of waste containing "new POPs" that are currently generated, then disposed of or recycled***

"new POPs"	Specification of waste	Waste generated (in kt)	Waste disposed of (in kt)	Waste recycled (in kt)
decaBDE				
SCCPs				
HCBD				

4. *Please provide i**nformation on wastes containing "new POPs" that are currently recycled** (now or in the near future) and on the extent of recycling. If possible, please specify the types of new articles produced from the recycled material.*

"new POPs"	Types of waste recycled	Recycling rate [%]	New articles produced from recycled material
decaBDE			
SCCPs			
HCBD			

Remarks:

5. *Please indicate up-to-date (reference) **measurement (analytical) methods** for identifying the presence and levels of the listed "new POPs" in waste.*

6. *Please indicate known inexpensive **screening methods** for identifying wastes containing "new POPs"*

7. *Please indicate any known **(production) processes using decaBDE, SCCPs and HCBD** as well as options for the environmental management of their operation and potential related **unintentional releases of these POPs** into the environment.*

II. Waste Management Options/Recycling Operations for "new POPs"

8. *Waste separation for decaBDE, SCCPs and/or HCBD containing wastes:*
*a) How can be **distinguished** between **contaminated and non-contaminated waste**?*
*b) Which **separation operations** should preferably be used **in practice to separate** contaminated from non-contaminated waste (please provide further details if available)?*
*c) What should be the preferred **waste management options for the contaminated waste fraction** (please provide justification and further details if available e.g. related costs)?*

a)

b)

Preferable separation operations	Relevant waste / new POP	Possible health risks for workers during separation of waste	Separation costs / ton of waste	Explanation / further information
1.				
2.				
3.				

Remarks:

c)

Preferable waste management operations	Relevant waste / new POP	Possible health risks for workers during waste management (e.g. recycling)	Management costs / ton of waste	Explanation / further information
1.				
2.				
3.				

Remarks:

III. Concentration Limits for decaBDE, SCCPs and HCBD

9. *Are you aware of* ***any existing concentration limits for decaBDE in waste?***

10. *Which* ***concentration limits for decaBDE in*** *waste according to the POP Regulation would you recommend? Please justify.*

11. *At which lower concentration limits for decaBDE in waste would you* ***expect relevant impacts*** *(e.g. on recycling industry)? Please justify.*

12. *Is there a* ***continued need for the derogation provided for POP-PBDEs in articles*** *produced from recycled materials in the POPs Regulation (i.e. level of 1,000 mg/kg or 0.1% by weight) of POP-PBDEs allowed in articles produced partially or fully from recycled materials?*[6] *Please justify.*

[6] See Annex I Regulation (EC) No 850/2004

13. *Is an* ***adjustment of existing POP limit values for SCCPs[7] and HCBD[8], as specified in Annex IV and V of the EU POP Regulation,*** *and/or* ***additional measures required*** *(e.g. due to any notable developments)? Please justify.*

14. *Please indicate if, beyond the EU POP Regulation, there are any adjustments to EU legislation needed, resulting from the listing of the "new POPs" decaBDE, SCCPs and HCBD under the Stockholm Convention.*

15. *Can you provide any other information or information sources relevant to Section I of this questionnaire on the "new POPs"?*

[7] Regulation (EC) 850/2004, Annex IV, concentration limit referred to in Article 7(4)(a): 10 000 mg/kg; Maximum concentration limits of substance listed in Annex IV: 10 000 mg/kg

[8] Regulation (EC) 850/2004, Annex IV, concentration limit referred to in Article 7(4)(a): 100 mg/kg; Maximum concentration limits of substance listed in Annex IV: 1000 mg/kg

Section II – "candidate POPs"

Dicofol, Pentadecafluorooctanoic acid (PFOA, perfluorooctanoic acid), its salts and PFOA-related compounds, Perfluorohexanoic acid (PFHxS), its salts and PFHxS-related compounds

I. Occurrence of "candidate POPs" Dicofol, PFOA and PFHxS (articles in use, waste, recycled articles as well as production processes and unintentional releases)

16. *a) Please indicate whether your country /company has* ***stockpiles*** *of "candidate POPs" listed.*

b) If ***yes****, please provide information on types, quantity, concentrations, etc.*

a)

b)

17. *Please indicate any known* ***occurrence and concentration of the "candidate POPs****", in different* ***articles in use, waste*** *categories* ***and recycled articles****.*

a) Dicofol	Specification of waste/article	Concentration [mg/kg]
Articles in use		
Wastes		
Recycled articles		
b) PFOA, its salts and PFOA-related compounds	Specification of waste/article	Concentration [mg/kg]
Articles in use		
Wastes		
Recycled articles		
c) PFHxS, its salts and PFHxS-related compounds	Specification of waste/article	Concentration [mg/kg]
Articles in use		
Wastes		
Recycled articles		

Remarks:

18. *Please provide* ***information on quantities of waste containing "candidate POPs" that are currently generated, then disposed of or recycled***

"candidate POPs"	Specification of waste	Waste generated (in kt)	Waste disposed of (in kt)	Waste recycled (in kt)
Dicofol				
PFOA, its salts and PFOA-related compounds				
PFHxS, its salts and PFHxS-related compounds				

19. *Please provide* ***information on wastes containing "candidate POPs" that are currently recycled*** *(or possibly in the future) and the extent of recycling. If possible, please specify the types of new articles produced from the recycled material?*

"candidate POPs"	Types of waste recycled currently (or in the future)	Recycling rate [%]	New articles produced from recycled material
Dicofol			
PFOA, its salts and PFOA-related compounds			
PFHxS, its salts and PFHxS-related compounds			

Remarks:

20. *Please indicate up-to-date (reference)* ***measurement (analytical) methods*** *for identifying the presence and levels of the listed "candidate POPs" in waste.*

21. *Please indicate known inexpensive screening methods for identifying waste to be classified as POPs wastes due to their content of the listed "candidate POPs".*

22. *Please indicate any known* ***(production) processes using dicofol, PFOA and PFHxS*** *as well as options for the environmental management of their operation and potential related* ***unintentional releases of these POPs*** *into the environment.*

II. Waste Management Options/Recycling Operations/for "candidate POPs"

23. *Waste separation for dicofol, PFOA and PFHxS containing waste:*
a) How can be ***distinguished*** *between* ***contaminated and non-contaminated waste?***
b) Which ***separation operations*** *should preferably be used* ***in practice to separate*** *contaminated from non-contaminated waste (please provide further details if available)?*
c) What should be the preferred ***waste management option for the contaminated waste fraction*** *(please provide justification and further details if available e.g. related costs)?*

a)

b)

Preferable separation operation	Relevant waste/candidate POP	Possible health risks for workers during separation of waste	Separation costs /ton of waste	Explanation / further information
1.				
2.				
3.				

Remarks:

c)

Preferable waste management operation	Relevant waste/candidate POP	Possible health risks for workers during waste management (e.g. recycling)	Management costs / ton of waste	Explanation / further information
1.				

2.				
3.				

Remarks:

III. Concentration Limits for dicofol, PFOA and PFHxS

24. *Are you aware of* ***any existing concentration limits for dicofol, PFOA and PFHxS in waste****? (please list limits individually)*

25. *Which* ***concentration limits for dicofol, PFOA and PFHxS in waste*** *according to the POP Regulation would you recommend? Please justify.*

26. *At which lower concentration limits* ***for dicofol, PFOA and PFHxS*** *in waste would you* ***expect relevant impacts*** *(e.g. on recycling industry)? Please justify.*

27. *Please indicate if, beyond the EU POP Regulation, there are any adjustments to EU legislation needed, resulting from the listing of the candidate POPs under the Stockholm Convention.*

28. *Can you provide any other information or information sources relevant to Section II of this questionnaire on the "candidate POPs"?*

Section III – "already listed POPs"

Hexabromocyclododecane (HBCD), Polychlorinated Biphenyls (PCB), Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF)

29. *Are the existing concentration limits in Annex IV and V of the EU POP Regulation* ***for HBCD, PCB and PCDD/F*** *appropriate to ensure a sufficient level of environmental and health protection or is it necessary to adjust* ***them*** *(e.g. due to any notable developments such as new scientific data and technical progress, etc.)? Please justify.*

The European HBCD Industry Group and EUMEPS are of the strong opinion that for HBCD the most appropriate low POP content limit ought to be 1000 mg/kg. A low POP limit of 1000 mg/kg is practical, pragmatic and environmentally sound. It will ensure both the protection of human health and of the environment. It can be implemented by the stakeholders in the waste management sector easily and effectively enforced by EU member states.

- A low POP content of 1000 mg/kg for HBCD captures all flame retarded polystyrene foam wastes from demolition[1], since such foams contain HBCD above 5000 mg/kg (EPS contains on average 5000-10000 mg/kg HBCD and XPS contains on average 8000-25000 mg/kg HBCD). A limit of 1000 mg/kg would therefore allow the destruction of HBCD incorporated in such flame retarded polystyrene foams.

- At present no robust analytical method for HBCD exists to provide satisfactory reproducible results at levels below 1000 mg/kg. A low POP limit any lower than 1000 mg/kg would make the analysis of the substance in polystyrene foam waste unnecessarily challenging, time consuming and costly, due to adequate sample preparation and extraction. Specifying a POP limit level below 1000 mg/kg cannot be easily enforced, controlled and reported.

- HBCD, being firmly incorporated in the stable polystyrene matrix, is not readily released from PS foam waste (containing HBCD) to the environment, be it to air, water or soil, and hence the environmental impact is minimal[2]. Therefore, the dismantling, transport or disposal of the waste foams do not have negative impacts for the environment. For example, this was also confirmed by the implementation of the German POP Waste Monitoring Ordinance (POP-Abfall-Überwachungs Verordnung) that entered into force on 1 August 2017[3]. It guarantees that specifically PS foam waste containing HBCD and other waste containing POPs are permanently disposed of in a way that is safe for the environment. No additional safety measures were pronounced. The industry's 7-year environmental monitoring programme has provided further evidence for a trend of decreasing levels of HBCD found in the environment in support of the minimal environmental impact of PS foams containing HBCD[4].

[1] For Parties that have registered to make use of the exemption, the same would apply for HBCD-containing waste from construction.
[2] ECHA 'Data on Manufacture, Import, Export, Uses and Release of HBCDD as well as information on potential alternatives to its use'. 2009 https://echa.europa.eu/documents/10162/13640/tech_rep_hbcdd_en.pdf; PlasticsEurope, Exiba, EFRA, CEFIC: 'HBCDD Hexabromocyclododecane in Polystyrene Foams Product Safety Assessment' 2016 (submitted to UNEP Secretariat together with this paper).
[3] Available at: https://www.gesetze-im-internet.de/pop-abfall-_berwv/BJNR264410017.html.
[4] H. Rüdel et al Rüdel, J. Müller, M. Quack, R. Klein, 2012: *Monitoring of hexabromocyclododecane diastereomers in fish from European freshwaters and estuaries*. Environ. Sci. Pollut. Res. 19, 772-783; and Rüdel H, Nowak J, Müller J, Ricking M, Quack M, Klein R: 'HBCD diastereomer levels in fish and suspended particulate matter from European freshwater and estuary sites - environmental quality standard compliance.

and trend monitoring', presentation at SETAC 2014 (A final publication summarising all the data from the environmental monitoring programme is expected to be published soon).

- A 1000 mg/kg limit would allow for the recycling of polystyrene foams which are not expected to contain HBCD. Packaging polystyrene foams typically do not contain HBCD, as flame retarded properties are generally not required in these applications. Levels of HBCD in such waste streams, due to possible contamination, are expected to be far less than 1000 mg/kg. Combined with the cost of analysis, a low POP limit of 1000 mg/kg will therefore contribute in maintaining the economic viability of recycling of polystyrene foams.

- A 1000 mg/kg limit ensures alignment with the limit values deemed safe in national or international regulations, such as EU REACH which defines a level of 0.1% w/w for articles containing substances of very high concern (SVHC). Other EU legislation, such as the EU RoHS and WEEE Directives, also set an allowed threshold limit of 1,000 mg/kg for the sum of PBDEs.

Hence, a POP limit of 1000 mg/kg provides for the necessary margin of safety and can be regarded as appropriate for meeting environmental and health concerns. A low POP limit value of 1000 mg/kg will suffice to maintain the downward trend of HBCD in the environment, given that following the listing of HBCD under the Stockholm Convention and the EU POPs Regulation, the use of HBCD in products is being discontinued worldwide.

30. *If the existing limit values need to be adjusted, which* ***concentration limits for HBCD, PCB and PCDD/F in waste*** *would you recommend and why?*

The European HBCD Industry Group and EUMEPS are of the strong opinion that the current limit should not be adjusted, for the reasons mentioned in the response to question 1.

31. *What would be the* ***major impacts from a possible adjustment of existing limit values of Annex IV or V of the EU POP Regulation****? Please justify.*

A low POP level of 1000 mg/kg represents a solid basis to ensure that all PS foam waste from demolition containing HBCD is channelled to destruction, providing for a sound and responsible end of life management of the HBCD-containing PS foam waste.

Considering circular economy aspirations, the low POP content limit ought to be such that it allows for the recovery and recycling of PS foams which do not contain HBCD. Even though investigations have shown that waste fractions of EPS packaging can contain HBCD, levels of contamination are comparatively low.

Considering the effectiveness, the cost and the logistics of analysis, a low POP limit of 1000 mg/kg allows for a manageable recycling of PS foams which are not meant to contain HBCD. A level lower than 1000 mg/kg is likely to bring such recycling operations economically off balance whilst endangering their compliance obligations. Furthermore, additional costs will result from an increase of the amounts of PS foams that would have to be incinerated, including also valuable foams that do not contain any HBCD. Therefore, lower levels than 1000 mg/kg are likely to hinder the achievement of recycling targets and the transition to a circular economy.