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Technical work: evaluation and review of brominated diphenyl ethers pursuant to paragraph 2 of parts IV and V of Annex A to the Stockholm Convention on Persistent Organic Pollutants

Draft report for the evaluation and review of brominated diphenyl ethers listed in Annex A to the Stockholm Convention

Note by the Secretariat

1. As is mentioned in the note by the Secretariat on the evaluation and review of brominated diphenyl ethers pursuant to paragraph 2 of parts IV and V of Annex A to the Stockholm Convention on Persistent Organic Pollutants (UNEP/POPS/POPRC.16/6), the annex to the present note sets out a draft report for the evaluation and review of brominated diphenyl ethers listed in Annex A to the Stockholm Convention, prepared by the Secretariat.

2. The draft report referred to above has been revised by the Secretariat, taking into account the comments received from the members and observers of the sixteenth meeting of the Persistent Organic Pollutants Review Committee, following the Committee's pre-meetings held from 1 to 3 December 2020. Revisions from the text set out in the document UNEP/POPS/POPRC.16/INF/11 have been tracked so that they can be easily identified.

3. The present note, including its annex, has not been formally edited.

* UNEP/POPS/POPRC.16/1.

Annex

Revised draft report for the evaluation and review of brominated diphenyl ethers listed in Annex A to the Stockholm Convention

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Abbreviations and acronyms

ABS	Acrylonitrile-butadiene-styrene
ASR	Automobile Shredder Residue
BAT	Best available techniques
BDE	Bromodiphenyl ether
BDE-40 to 81	TetraBDE congeners
BDE-82 to 127	PentaBDE congeners
BDE-128 to 169	HexaBDE congeners
BDE-170 to 193	HeptaBDE congeners
BDE-194 to 205	OctaBDE congeners
BDE-206 to 208	NonaBDE congeners
BDE-209	DecaDBE congener
BEP	Best environmental practices
BFR	Brominated flame retardant
Br	Bromine
c-octaBDE	Commercial octabromodiphenyl ether
COP	Conference of the Parties
c-pentaBDE	Commercial pentabromodiphenyl ether
CRT	Cathode ray tube
DBDPE	Decabromodiphenyl ethane, decaBDPE
DecaBDE	Decabromodiphenyl ether
EEE	Electric and electronic equipment
ELV	End-of-life vehicles
EPR	Extended producer responsibility
EU	European Union
FR	Flame retardants
GC-MS	Gas chromatography mass spectrometry
HBB	Hexabromobiphenyl
HBCD	Hexabromocyclododecane
HBCDD	Hexabromocyclododecane
HeptaBDE	Heptabromodiphenyl ether
HexaBDE	Hexabromodiphenyl ether
HFR	Halogenated flame retardant
Mt	Million metric tons
NIP	National implementation plan (Stockholm Convention)
OctaBDE	Octabromodiphenyl ether
PBDE	Polybrominated diphenyl ethers (may also contain BDE that are not listed in the Stockholm Convention)
PC	Personal computer

PE	Polyethylene
PentaBDE	Pentabromodiphenyl ether
PFOS	Perfluorooctane sulfonic acid
POP	Persistent organic pollutant
POP-BDEs	Brominated diphenyl-ethers listed in the Stockholm Convention in 2009 (tetra-BDE, penta-BDE, hexa-BDE, hepta-BDE)
PP	Polypropylene
PS	Polystyrene
PST	Post sorting treatment
~~PUF~~	~~Polyurethane foam~~
PUR	Polyurethane
PVC	Polyvinyl chloride
SHA	Small household appliances
TBBPA	Tetrabromobisphenol A
TetraBDE	Tetrabromodiphenyl ether
TV	Television
UK	United Kingdom of Great Britain and Northern Ireland
UNEP	United Nations Environment Programme
USA	United States of America
WEEE	Waste electric and electronic equipment
XRF	X-ray fluorescence

I. Introduction

1. At its fourth meeting in May 2009, the Conference of the Parties (COP) to the Stockholm Convention on Persistent Organic Pollutants (POPs) decided to amend Annex A of the Convention to add the following chemicals: hexabromodiphenyl ether and heptabromodiphenyl ether (by decision SC-4/14) and tetrabromodiphenyl ether and pentabromodiphenyl ether (by decision SC-4/18). The amendments included specific exemptions for the recycling of articles that contain or may contain these chemicals, and the use and final disposal of articles manufactured from recycled materials that contain or may contain these chemicals. Parties that wish to make use of these exemptions are to notify the Secretariat and meet the other conditions set out in parts IV (for hexabromodiphenyl ether and heptabromodiphenyl ether) and V (for tetrabromodiphenyl ether and pentabromodiphenyl ether) of Annex A to the Convention.

2. Paragraph 2 of parts IV and V of Annex A to the Convention provides that at its sixth ordinary meeting and at every second ordinary meeting thereafter the COP shall evaluate the progress that Parties have made towards achieving their ultimate objective of elimination of hexabromodiphenyl ether and heptabromodiphenyl ether and tetrabromodiphenyl ether and pentabromodiphenyl ether contained in articles and review the continued need for the specific exemptions for those chemicals. The specific exemptions shall in any case expire at the latest in 2030.

3. Hexabromodiphenyl ether (hexaBDE) and heptabromodiphenyl ether (heptaBDE) together make up 54% of the congeners contained in commercial octabromodiphenyl ether (c-octaBDE). Tetrabromodiphenyl ether (tetraBDE) and pentabromodiphenyl ether (pentaBDE) are the main congeners in commercial pentabromodiphenyl ether (c-pentaBDE). Throughout this report, POP-BDEs refer to the congeners of the polybrominated diphenyl ethers (PBDEs) listed under the Stockholm Convention in 2009.

A. Mandate

4. At its sixth meeting in May 2013, by decision SC-6/3, the Conference of the Parties adopted a process for the evaluation of the progress that parties have made towards achieving their ultimate objective of elimination of hexabromodiphenyl ether and heptabromodiphenyl ether and tetrabromodiphenyl ether and pentabromodiphenyl ether contained in articles and the review the continued need for the specific exemptions for those chemicals. By decision SC-8/4, the Conference of the Parties decided to undertake the evaluation and review of brominated diphenyl ethers at its tenth meeting in accordance with the schedule set out in the annex to that decision and the process set out in the annex to decision SC-6/3.

5. As part of the process, the Secretariat is to analyse the information submitted by Parties and any other pertinent and credible information available. Based on this analysis, the Secretariat, with advice from relevant experts such as the members of the Persistent Organic Pollutants Review Committee, is requested to prepare a report to assist the COP in undertaking the evaluation and review of POP-BDEs.

B. Sources of information

6. This report provides information that has become available since 2015 when the report for the evaluation and review of brominated diphenyl ethers listed in Annex A to the Stockholm Convention (UNEP/POPS/COP.8/INF/12) was prepared by the Secretariat to assist the COP in undertaking the evaluation and review of POP-BDEs at its eighth meeting. The main sources of information used in the preparation of this report are:

(a) The information provided by Parties[1] using the format for the submission of information for the evaluation and review of POP-BDEs pursuant to paragraph 2 of parts IV and V of Annex A to the Convention set out in the annex to decision SC-7/4 (referred to in this report as the BDEs questionnaire). As of 20 April 2020, 37 Parties and one observer[2] had provided a completed questionnaire to the Secretariat. The information submitted is compiled in appendix I to the present report;

(b) The fourth national reports submitted by Parties pursuant to Article 15 to the Convention. By 1 October 2020, 78 Parties had submitted their fourth national report[3]. Relevant information pertaining to POP-BDEs contained in the reports is summarized in appendix II to the present report;

(c) The national implementation plans (NIPs) submitted by Parties pursuant to Article 7 of the Convention. By 1 October 2020, 97 Parties had submitted NIPs that had been updated to reflect changes arising

[1] At 1 October 2020, 175 Parties had agreed to be bound by the 2009 amendments listed in decisions SC-4/14 and SC-4/18.

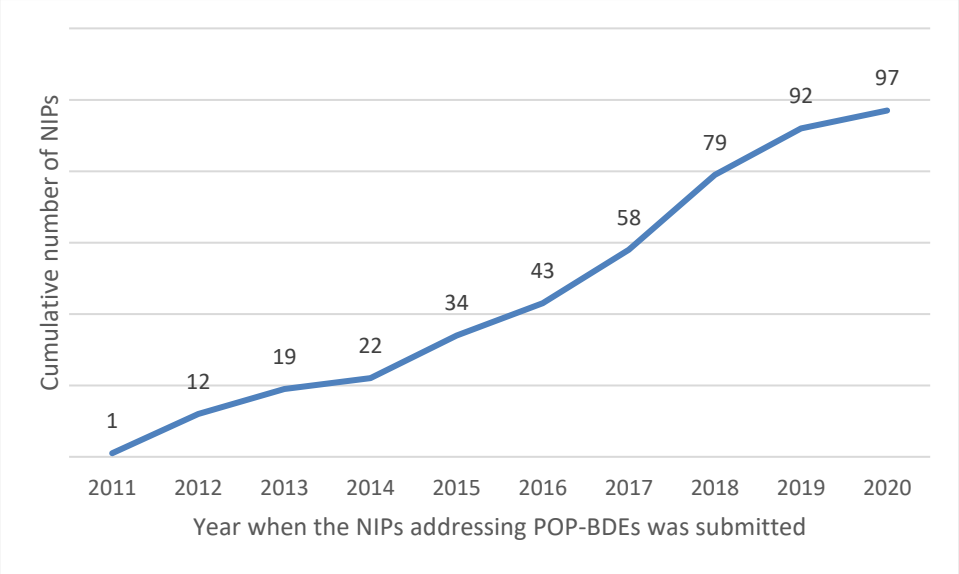
[2] Submissions were received from: Australia, Austria, Bosnia and Herzegovina, Bulgaria, Cameroon, Canada, Chile, Côte d'Ivoire, Estonia, Germany, Guyana, Hungary, Kyrgyzstan, Lebanon, Luxembourg, Maldives, Mauritius, Mexico, Monaco, Montenegro, New Zealand, Norway, Peru, Poland, Portugal, Romania, Russian Federation, Sao Tome and Principe, Serbia, Spain, Sri Lanka, Suriname, Switzerland, Thailand, Turkey, United Kingdom, Zimbabwe and United States (observer).

[3] http://chm.pops.int/Countries/NationalReports/FourthRoundPartyReports/tabid/6346/Default.aspx.

from the addition of POP-BDEs to Annex A of the Convention (figure 1), an increase of 57 NIPs since document UNEP/POPS/COP.8/INF/12 was prepared. Appendix III to the present report provides a summary of information extracted from submitted NIPs, including national POP-BDE inventories;

(d) Reports from the scientific and grey literature.

Figure 1. Cumulative number of NIP updates addressing POP-BDEs submitted to the Secretariat (as of 1 October 2020)



II. Measures to reduce or eliminate releases from intentional production and use (Article 3)

A. Regulatory actions to eliminate the use and production of POP-BDEs

7. According to the information submitted by Parties in their national reports, 65 Parties had prohibited and/or taken legal and administrative measures necessary to eliminate releases from intentional production and use of tetraBDE and pentaBDE and/or hexaBDE and heptaBDE (Figures 2a and 2b).

Figure 2a. Cumulative number of Parties indicating that they have prohibited and/or taken legal and administrative measures necessary to eliminate releases from intentional production and use of hexaBDE and heptaBDE

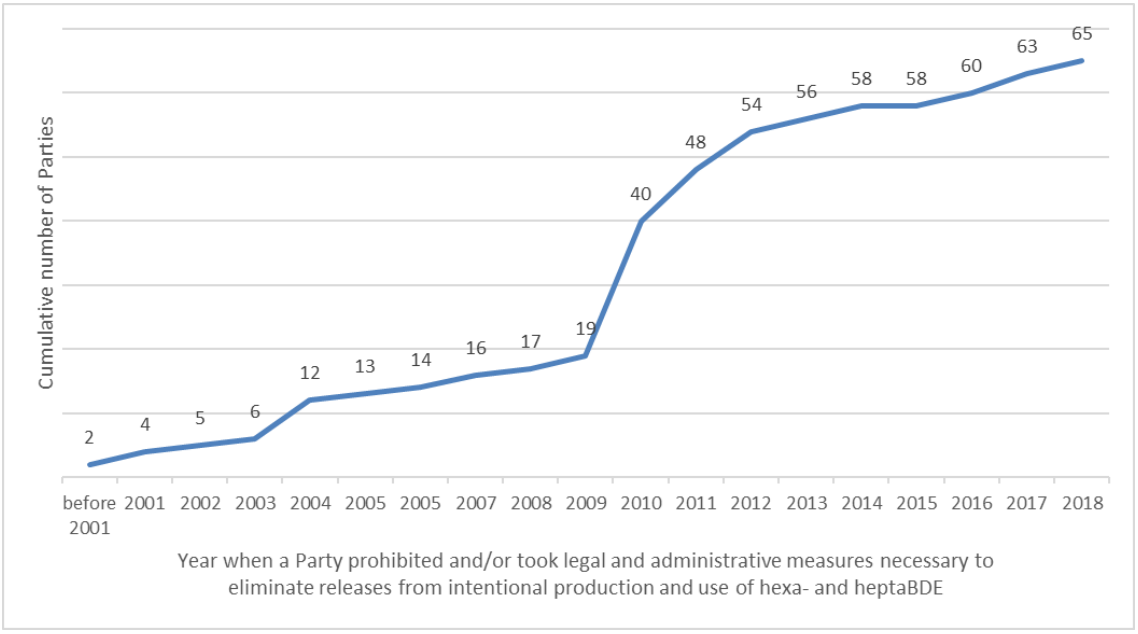
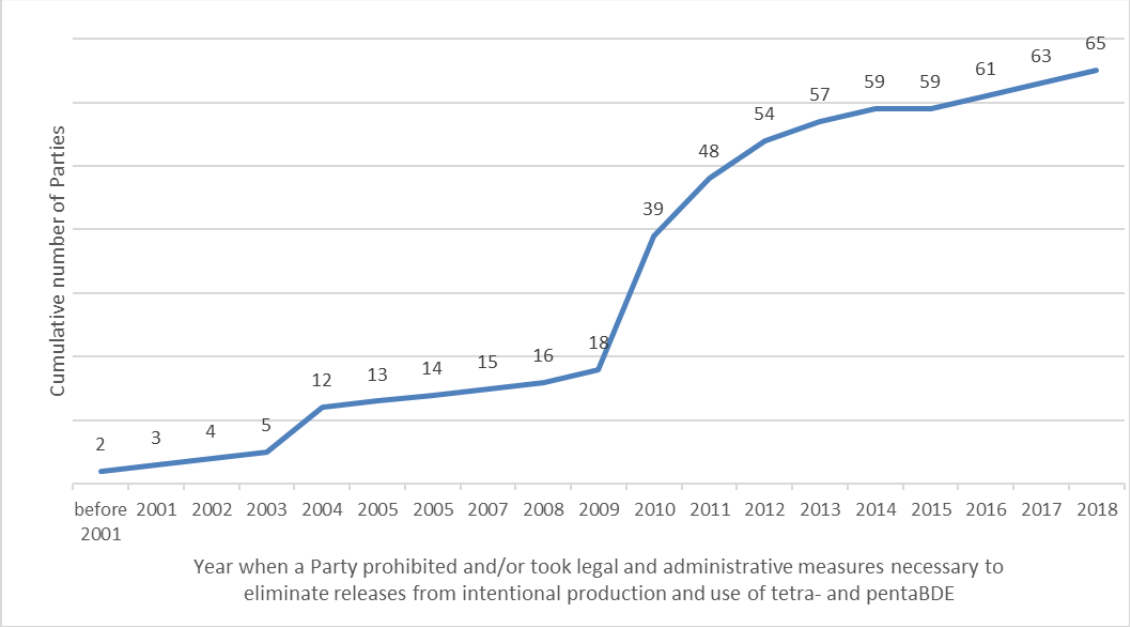


Figure 2b. Cumulative number of Parties indicating that they have prohibited and/or took legal and administrative measures necessary to eliminate releases from intentional production and use of tetraBDE and pentaBDE



8. Details about measures taken are provided in some cases in NIPs and/or through the BDEs questionnaire submitted by Parties (appendix I). For example, Parties that are members of the European Union (EU) implement a number of legislative instruments to regulate POP-BDEs throughout their life-cycle (European Commission, 2019). The main instrument, Regulation (EC) No 850/2004, contains provisions regarding the production, placing on the market and use of POP-BDEs and the management of stockpiles and wastes consisting of or containing POP-BDEs. The regulation prohibits the production, placing on the market and use of hexaBDE, heptaBDE, tetraBDE and pentaBDE, whether on their own, in preparations or as constituents of articles above a limit of 0.001 % by weight; a derogation applies to articles and preparations containing concentrations below 0.1 % by weight of these substances when produced partially or fully from recycled materials or materials from waste prepared for re-use and to electrical and electronic equipment within the scope of Directive 2002/95/EC (recast as Directive 2011/65/EU). The latter prohibits the placing on the market of electrical and electronic equipment that contains more than 0.1% by weight of polybrominated diphenyl ethers in homogeneous materials. Other legislative instruments of particular relevance for the management of POP-BDEs include the WEEE Directive (Directive 2012/19/EU) and the ELV Directive (Directive 2000/53/EC) that mandates the removal and proper treatment of components containing POP-BDEs from waste electrical and electronic equipment (WEEE) and end-of-life vehicles (ELV), respectively.

B. Production of POP-BDEs

9. As summarised in document UNEP/POPS/COP.8/INF/12, c-pentaBDE has been produced in Israel, Japan, the United States of America (USA) and European Union (EU); production ended in Europe in 1997 and in the USA in 2004. C-octaBDE has been produced in the Netherlands, France, USA, Japan, UK and Israel, but since 2004, it is no longer produced in the EU, USA and the Pacific Rim. Some c-pentaBDE but no c-octaBDE has been produced in China. The estimated total production from 1970 to 2005 is between 91,000 and 105,000 tons for c-pentaBDE and 102,700 and 118,500 tons for c-octaBDE. Given the lack of demand resulting from regulatory action to phase-out the use of c-pentaBDE and c-octaBDE in many countries, it is likely that there is no longer any significant global production of these chemicals. No new information on production of POP-BDEs was identified.

C. Use of POP-BDEs

10. The largest proportion of c-pentaBDE has been used in the treatment of polyurethane (PUR) foam ~~(PUR)~~, mainly in the USA and to some extent in Europe. It is estimated that about 36% of c-pentaBDE produced has been used in automotive applications (cars) and 60% in upholstery applications (UNEP, 2010). The largest use of c-octaBDE has been for the treatment of acrylonitrile-butadiene-styrene (ABS) plastics which was typically used in electrical and electronic equipment (EEE), particularly for cathode ray tube (CRT) housings of televisions and computer monitors and office equipment such as copying machines and business printers. It is estimated that the majority of articles containing c-octaBDE would have been used in North America and Europe.

11. The lifespan of articles is a determinant of the quantities of articles containing POP-BDEs that remain in use in a given country and the time at which these enter the waste stream. Taking into account the phase-out dates of POP-BDEs in developed countries where they were most heavily used and the lifespan of articles containing POP-BDEs, it is expected that in these countries, a large share of such articles would already have reached their end-of-life and entered the waste stream. The use of c-pentaBDE and c-octaBDE were banned in the EU in 2004. Assuming a lifespan of 10 years for upholstery applications and 16 years for automotive applications, the majority of articles containing c-pentaBDE would reach their end-of-life at the latest by 2020. In the case of articles treated with c-octaBDE, assuming a lifespan of 10 years for electronic and electrical equipment, the majority would have reached their end-of-life by 2014 (European Commission, 2019). The lifespan of articles containing POP-BDEs is likely to be longer in some developing countries where re-use and repair of electronic equipment and cars are common. For example in Mexico, the lifespan of televisions is estimated to be between 10-18 years (appendix I). See Section III below for information on POP-BDEs in the waste stream.

1. Notifications of articles in use

12. Pursuant to note (ii) to part I of Annexes A and B of the Convention, the Secretariat receives from Parties notifications of chemicals occurring as constituents of articles manufactured or already in use before or on the date of entry into force of the obligations under the Convention applicable to those chemicals. As of 1 October 2020, notifications pertaining to tetraBDE and pentaBDE and hexaBDE and heptaBDE had been received from four Parties and three Parties, respectively. The information concerning these notifications is reproduced in tables 1a and 1b.

Table 1a. Notifications of articles in use for tetraBDE and pentaBDE

Party	Article in use	Date of notification	Any comments linked to actual notification
Cambodia	Cars with PUR foam in car seats contaminated with TetraBDE and PentaBDE remain in use within the country.	20/01/2016	
Canada	Textile and foam-based products such as mattresses, furniture and carpet backing	21/12/2010	While manufacture, import and use of C-PentaBDE commercial mixtures are prohibited, some articles containing this commercial mixture could still be in use in Canada
New Zealand	PentaBDE was used as a flame retardant in a wide range of consumer products including textile and foam-based products such as mattresses, furniture and carpet backing. Its main use was in polyurethane foam.	20/12/2016	Manufacture, import and use of pentaBDE has been prohibited in New Zealand since August 2011. However, it is likely that there are some articles containing pentaBDE remaining in use.
Norway	Norwegian authorities have no information to indicate that pentaBDE is a constituent of articles in use. In the case that such use still occurs it must be anticipated that it relates to products that were on the marked before the ban entered into force in 2004, and that have not yet been phased out.	06/04/2011	Production, import, export and placing on the market of all formulations, products, and parts of products containing greater than or equal to 0.1% by weight of pentaBDE is in Norway prohibited through §2-20 of the Product Regulations. This ban entered into force on 1 July 2004, and as lain down in the Waste Regulation also extends to waste. As of 1 January 2004 waste containing more than 0.25% of pentaBDE is defined as hazardous waste and has to be treated according to regulations on hazardous waste. Permissions to export hazardous waste for recycling are not granted. Historically, the main use of pentaBDE in Norway related to products. Use of pentaBDE as a flame retardant in electrical and electronic equipment, polyurethane foam, textiles and in means of transportation was been identified. However, import, export and use of pentaBDE for all these purposes ceased when the final regulatory action of pentaBDE entered into force in 2004. Available numbers from the textile industry in Norway, suggest that the total

			use of penta- and octaBDE for textile production, previous to the ban, in the period 1997-2003, was 75 kg/year. This use ceased with the ban in 2004.

Table 1b. Notifications of articles in use for hexaBDE and heptaBDE

Party	Article in use	Date of notification	Any comments linked to actual notification
Canada	Products containing acrylonitrile butadiene styrene (ABS) plastics such as electronic equipment	21/12/2010	While manufacture, import and use of C-octaBDE commercial mixtures are prohibited, some articles containing this commercial mixture could still be in use in Canada
New Zealand	OctaBDE was used as a flame retardant in a number of types of plastics, primarily in electrical and electronic equipment.	20/12/2016	Manufacture, import and use of octaBDE has been prohibited in New Zealand since August 2011. However, it is likely that there are some articles containing octaBDE remaining in use.
Norway	Norwegian authorities have no information to indicate that octaBDE is a constituent of articles in use. In the case that such use still occurs it must be anticipated that it relates to products that were on the marked before the ban entered into force in 2004.	06/04/2011	Production, import, export and placing on the market of all formulations, products, and parts of products containing greater than or equal to 0.1 % by weight of commercial octaBDE is in Norway prohibited through §2-20 of the Product Regulations. This ban entered into force on 1 July 2004, and also extends to waste. As of 1 January 2004, and as lain down in the Waste Regulation, waste containing more than 0.25% of octaBDE is defined as hazardous waste and has to be treated according to regulations on hazardous waste. Permissions to export hazardous waste for recycling are not granted. Historically, the main use of octaBDE in Norway was related to products. Identified uses include the application of octaBDE as a flame retardant in polymers, high impact polystyrene and in electrical and electronic equipment. However, import, export and use of octaBDE for all these purposes ceased when the final regulatory action of octaBDE entered into force in 2004. Available numbers from the textile industry in Norway, suggest that the total use of penta- and octaBDE for textile production, previous to the ban, in the period 1997-2003, was 75 kg/year. This use ceased with the ban in 2004.

2. Presence of POP-BDEs in articles in use

13. In decision SC-8/4, the Conference to the Parties encouraged Parties to collect information on the types and quantities of brominated diphenyl ethers in articles in use and in the waste and recycling stream and on measures taken to ensure their environmentally sound management pursuant to Article 6 of the Convention and, where appropriate, parts IV and V of Annex A to the Convention and to make that information available to the Secretariat.

14. Document UNEP/POPS/COP.8/INF/12 reported that only few studies had been conducted to assess the levels of POP-BDEs in articles placed on the market and highlighted the results of several of these studies. For example, by 2008, in Switzerland, levels of POP-BDEs in articles placed on the market had decreased to below the limits set by regulations on the use of these chemicals. In Australia, levels of c-octaBDE detected in articles were below those typically used to comply with flammability requirements, suggesting that c-octaBDE may have unintentionally been introduced into these articles through the recycling process. Information from preliminary inventories of POP-BDEs undertaken as part of NIP updates indicates that there are substantial quantities of articles containing POP-BDEs that could be present in articles in use or stockpiled in developing countries and countries with economies in transition (appendix III).

15. Since document UNEP/POPS/COP.8/INF/12 was prepared, a few additional studies have been published that provide information on the types and quantities of brominated diphenyl ethers in articles in use.

16. Abbasi and colleagues (2019) have estimated that from the 180 kt of PBDEs (congeners 28, 47, 99, 153, 183) produced, 25 kt were still present in articles in use in 2018. All of this remaining stock is expected to be disposed of by 2030. Without improved waste management measures, it is estimated that 5 kt of these PBDEs could end up in recycling processes and reappear in plastic articles.

17. A recent study attempted to synthesise about 1,000 published data from 40 references of brominated flame retardants (BFRs) concentrations, among which POP-BDEs and decaBDE, in plastics of electrical and electronic equipment, vehicles, textiles and construction products (Hennebert, 2018; INERIS, 2018). The report discusses the pitfalls of comparing data across studies undertaken using different sampling methods, including methods for extracting BFRs from analytical samples. Reported concentrations are heterogeneous and no information is provided as to when the samples analysed were collected. Mean concentrations of PBDE in EEE and WEEE were calculated to be 4,023 mg/kg, with a reported range of 0-154,000 mg/kg (Table 2). The same study also compiled information on concentration of BFR in vehicles parts and end-of-life vehicles (ELV). The mean concentration in was calculated at 1,725 mg/kg with a range of 0-85,000 mg/kg (Table 2). The mean PBDE concentration in various car parts was calculated at 2,467 mg/kg (111 data points). Data on PBDE concentrations in textiles are scarce. The unweighted mean of all BDE groups was calculated at 24,000 mg/kg with a reported concentration range from 0 to 120,000 mg/kg (Hennebert, 2018). Data on plastics from construction are even ~~more scarce~~scarcer, but shows potential for very high concentrations with a reported mean of 123,000 mg/kg PBDE (Table 2).

18. The concentration of PBDE is bimodal as illustrated by the difference between the mean and median values of concentrations: for example, mean 4,023 mg/kg and median of 50 mg/kg of PBDE in EEE/WEEE (Hennebert 2018) (Table 2). About 20%, 10%, 70% and 90% of plastics from EEE/WEEE, vehicles/ELV, textiles and construction plastics, respectively, could contain PBDEs or decaBDE at concentrations above 1,000 mg/kg which is the regulatory concentration limit for products (and recyclates) in the EU.

19. Six daily use consumer items obtained on the market in China were analysed. Concentration of total PBDEs (15 congeners including decabromodiphenyl ether (decaBDE)) ranged between 0.17 and 9.64 mg/kg, or 1-3 orders of magnitude lower than found in e-waste and recycled plastic materials (Li et al, 2019; see also Table 5).

Table 2. Mean PBDE concentration (mg/kg) in articles from various use categories (Hennebert, 2018)

Source of plastic	No. of data points	Mean concentration (mg/kg)	Median concentration (mg/kg)	Range (mg/kg)	% above 1,000 mg/kg
EEE/WEEE	530	4,023	50	0-154,000	19
Vehicle/ELV, including ASR and PST	183	1,725	10	0-85,000	8
Textiles, furniture, upholstery	23	2,4293	15,500	0-120,000	70
Construction	10	122,580	100,000	0-300,000	90

20. A study in France analysed the concentrations of BFR including PBDEs in new EEE obtained between 2009 and 2013 inclusive (Hennebert and Filella, 2018; INERIS, 2017). The analysis showed that 52 of 347 (15%) articles did not contain bromine, while 158 (46%) had at least one part that contained bromine and a large proportion had several brominated parts (137 or 39%). Bromine was detected in more than 70% of large household appliances, toys and tools, over 50% of small household appliances and lighting fixtures, and in approximated 25% of audio-visual, information and telecommunications equipment. The bromine concentration is very heterogeneous with tools, lighting and large household appliances having an average bromine content exceeding 2,000 mg/kg. PBDEs were among the most commonly detected brominated constituent, primarily as decaBDE. Table 3 provides a summary of the concentrations of PBDEs found in the 22 EEE items analysed.

Table 3. Average concentration of PBDEs (mg/kg) in new EEE collected in France between 2009 and 2013 (Hennebert and Filella, 2018).

		HexaBDE	HeptaBDE	OctaBDE	NonaBDE	DecaBDE*
EEE (32 parts of 22 items)	Min	5	10	21	24	54
	Mean	9	40	21	60	223
	Max	13	91	21	112	991

* TetraBDE and pentaBDE congeners were below the level of quantification.

21. POP-BDEs have also been detected in articles, including plastic toys, where they would not have been added to meet flammability requirements (Table 4). The low levels of POP-BDEs in these articles suggest that their presence is not the result of intentional use but likely the result of recycling of plastics that contain POP-BDEs.

22. Results from a recent study in the UK (see section III.A) indicate that articles which were previously considered to be ~~POPs~~ POPs-free do contain PBDEs and are now required to be dealt with according to EU regulations on POPs. The results from the study indicate varying levels of PBDEs in some articles in use in the UK, including some lower levels which can indicate that those articles are made from recycled materials which contained traces of PBDEs (appendix I).

23. Recycled plastic samples were obtained from the Chinese market and analysed for halogenated flame retardants (HFRs), including 8 PBDEs. BDE 209 (deca-BDE) and decabromodiphenyl ethane (DBDPE) were the most abundant HFRs. BDE congeners (excluding decaBDE) accounted for up to 16.0% of total HFR, with concentrations of 3.54 ± 3.38 mg/kg (Table 4). Concentrations in ABS plastics were much higher than in the other types of plastics analysed (Polyethylene, polystyrene, polypropylene and polyvinyl chloride (PVC)) (Cao et al., 2019).

24. Thirty-five samples of processed plastics obtained from China, Denmark, Germany, and the Netherlands were analysed for presence of POP-BDEs. These were found to be present in both virgin and recycled plastics (Pivnenko et al, 2017). POP-BDEs were most often detected in polystyrene and polyolefin~~s~~ resins with BDE-99 being the most commonly identified congener present (Table 4). The authors suggest that the presence of PBDEs could be attributed to contamination through recycling.

25. The European Commission (2019) notes that goods made of recycled plastic imported into Europe can also be a source of articles containing POP-BDEs, such as children toys (Chen et al., 2009), household goods (Chen et al., 2010) and video tapes (Hirai and Sakai, 2007). Global supply chains and flows of material are not well tracked which makes the identification of PBDE contaminated material difficult.

Table 4. Levels of various PBDE congeners in articles potentially produced from recycled plastics

Article	Manufacturing countries	Manufacturing year	Number of samples	PBDE congeners mg/kg	Reference
Recycled plastic pellets	China	--	23 Samples	3.54 ±3.38	Cao et al., 2019
Recycled plastic pellets	On the market in the Netherlands	On the market in 2013	5 samples	<0.7–67	Leslie et al, 2016
Insulation/carpet padding	On the market in the Netherlands	On the market in 2013	3 samples	<0.001–0.04	Leslie et al, 2016
Office and kitchen products	On the market in the Netherlands	On the market in 2013	4 samples all below the level of detection	<0.005	Leslie et al, 2016
Processed plastics (virgin and recycled)	China, Denmark, Germany, and the Netherlands	On the market 2013	35	Frequency of detection BDE-47: 29 % BDE-85: 0 % BDE-99: 37 % BDE-100: 11 % BDE-153: 9 % BDE-154: 6 %	Pivenko et al, 2017
Toys	On the EU market	On the market 2016 (assumed)	11 items, 9 below level of detection	HeptaBDE <1– 20	Guzzonato et al, 2017
Thermal cup	On the EU market	On the market 2016 (assumed)	2 items	HeptaBDE <1	Guzzonato et al, 2017
EEE	On the EU market	On the market 2016 (assumed)	1	HeptaBDE <1	Guzzonato et al, 2017

Toy - Rubik's cubes and other consumer items (thermo cup, hair clips, combs, headdresses, and children's toys)	On the market in 26 countries	On the market in 2018	95 Rubik's cubes and 16 other items 100 samples (90% contained octaBDE; 39% octaBDE > 50 mg/kg)	OctaBDE 1–1,174	Straková et al., 2018
Toys, hair accessories, kitchen utensils and other consumer Products	On the EU market	On the market in 2018	50 samples (46% with octaBDE >10 mg/kg)	OctaBDE >10	Straková et al., 2018
Toys, hair accessories, kitchen utensils and other consumer products	On the EU market	On the market in 2018	94 samples (86% contained octaBDE)	OctaBDE 1–161	Straková et al., 2018
Toy guitar	On the Portuguese market	On the market 2018	1	PBDEs 3,318 mg/kg	Straková et al., 2018

3. Register of specific exemptions

26. Parties that have the intention to make use of the specific exemption for the use of BDEs should notify the Secretariat accordingly, pursuant to parts IV and V of Annex A to the Convention. The information contained in the registers of specific exemption for these chemicals is reproduced in appendix IV of the present report. As of 1 October 2020, four Parties were registered for specific exemptions for the use of tetraBDE and pentaBDE and five Parties were registered for specific exemptions for the use of hexaBDE and heptaBDE[4]. Since the COP last undertook the evaluation and review of POP-BDEs at its eighth meeting, one party (Republic of Korea) has registered for specific exemptions for POP-BDEs and two Parties (Canada and EU) have withdrawn their registrations for such exemptions.

27. Out of 24 Parties that indicated that they were not registered for specific exemptions through the BDEs questionnaire (excluding those had withdrawn from the register), 58% indicated that such exemptions were not needed, 21% indicated that they had assessed their need for exemptions but lacked capacity and/or resources for further action and 21% indicated that they had not assessed their need exemptions for lack of capacity and/or resources (appendix I).

III. Measures to reduce or eliminate releases from stockpiles and wastes (Article 6)

A. Measures to identify products and articles in use and wastes containing POP-BDEs

28. Pursuant to Article 6 of the Stockholm Convention, Parties are to develop strategies for identifying products and articles in use and wastes consisting of, containing or contaminated with POP-BDEs. The difficulty of identifying articles containing POP-BDEs in importations and in the waste stream is one of the main challenges encountered by Parties in implementing the recommendations set out in the annex to decisions POPRC-6/2[5].

29. Fourteen Parties have indicated in their fourth national reports that they have developed such strategies with regard to POP-BDEs (appendix II). For the most part, details about the strategies developed are not available.

30. It is estimated that 155 of the 180 kt of PBDEs produced globally (congener 28, 47, 99, 153, 183) have entered the waste stream by 2018 (Abbasi et al. 2019). About 70% of PBDEs, including decaBDE, in waste have

[4] http://chm.pops.int/Implementation/Exemptions/SpecificExemptions/tabid/1133/Default.aspx.

[5] POPRC-6/2: Work programmes on new persistent organic pollutants (UNEP-POPS-POPRC.6-POPRC-6-2.English).

been disposed of in controlled landfills and another 10% in dumpsites and simple landfills. Another 5% have been destroyed through incineration and 4% have ended up in wastewater treatment systems. Approximately 6% of the total waste was treated inappropriately and 5% recycled inadvertently. Remaining stocks are expected to be disposed by 2030. However, PBDEs will likely continue to be emitted to the environment until 2050. ~~Approximately 2.6 million tons of WEEE plastics are currently generated annually in Europe (Haarman et al., 2020). About 9% of this waste contains BFRs, with restricted BFRs such as octa-BDE and deca-BDE) representing a small and decreasing fraction of these. About half of the WEEE is collected through official channels and sent to specialised WEEE plastics recycling facilities or for thermal destruction. The remainder ends up in the general waste collection.~~

31. Table 5 presents data on concentration of PBDEs in various waste streams from recent studies. Several of these studies examine levels of various congeners of BDEs, including decaBDE. A study conducted in 2011 examined current concentrations and flows for a variety of substances found in waste electronic and electrical equipment (WEEE) in Switzerland, and compared them with the levels recorded in 2003 (FOE, 2017). Among the substances examined were PBDEs including pentaBDE, octaBDE and decaBDE. The halogenated flame retardant that was most frequently found was tetrabromobisphenol A (TBBPA), followed by decaBDE. The average concentrations of pentaBDE in the waste decreased by 93% between 2003 and 2011, and of octaBDE by 77%. Due to increase in waste flows the decrease in total mass was smaller, 91% for pentaBDE and 70% for octaBDE. The total mass of penta- and octaBDE in waste was estimated to be 29.8 t in 2003. By 2011, the annual amount of POP-BDE waste generated had decreased to 8.56 t per year.

32. DecaBDE was the prevalent PBDE congener identified in plastics collected from recycling facilities in the Netherlands. POP-BDEs were commonly found with levels as high as 330 mg/kg reported in shredder material; lower concentrations were found in plastics of mixed origin and shredded automotive plastic. Higher density WEEE plastic fractions had higher POP-BDE concentrations, with less than an order of magnitude between high- and low-density plastic fractions. Compared to polystyrene (PS) pellets, BDE concentrations were considerably higher in purified ABS. The authors conclude that current state-of-the-art separation techniques in WEEE treatment does not remove all POP-BDEs from the recycling stream (Leslie et al 2016).

33. The amount of POP-BDE in waste in the Netherlands was estimated to be 7.0 t/year in WEEE and 0.20 t/year in automotive waste. The annual plastics flow in WEEE was around 72,000 t, and that of ELVs about 20,000 t. Average POP-BDE concentrations in shredded ELV plastics flows is estimated at tens of mg/kg; those in shredded WEEE plastics are about 10 times higher. The mass flow analysis showed that 22% of POP-BDE in WEEE and 14% in ELV shredder waste likely ends up in recycled plastics; 19% of POP-BDE end in end up in used parts. Carpeting and insulation made from recycled materials that were analysed in this study contained either decaBDE at concentrations of up to 0.8 mg/kg) or a combination of both decaBDE and POP-BDEs (up to 0.4 mg/kg). A quarter of the toys sampled contained flame retardants including POP-BDEs (up to 44 mg/kg) and decaBDE (up to 800 mg/kg) (Leslie et al., 2016).

34. The amount of plastic being recycled in China is increasing – 104 kt were recycled in 2012 and 403 kt 2017 (Li et al., 2019). It is estimated that these recycled plastics contained 202.56 t of PBDEs (including decaBDE) in 2012 increasing to 687.81 t in 2017.

35. ELV shredder residues from two samples taken in 2014 in Ireland were analysed for POPs (European Commission, 2019). POP-BDEs were present at concentrations between 103 and 197 µg/kg (sum of tetra-, penta-, hexa- and hepta- congeners). The samples contained shredder waste from ELVs between 10 and 26 years old (average 15 years). ELVs contributed about 105 t/year of tetraBDE and about 200 t/y of pentaBDE to the waste stream. However, Drage and colleagues (2018) estimated a smaller amount was being generated – 121 kg/year of POP-BDE.

36. In a study undertaken for the Norwegian Environment Agency, 21 of 49 samples of WEEE and ELVs, including a reference sample, had bromine levels above 500 mg/kg. Twenty two of the 24 samples analysed by mass spectrometry contained BDE-209 (decaBDE) with the highest concentration measured as 900 mg/kg in the unseparated reference sample. The highest measured concentration of BDE-209 in materials that had gone through a separation process was 280 mg/kg from small domestic appliances. Of the 24 waste samples analysed, 5 contained measurable amounts of POP-BDEs. The highest concentration measured was 16 mg/kg (Stråât and Nilsson, 2018). Waste collected in 2013 and 2014 from three waste facilities in Norway was analysed for PBDEs. The plastic from WEEE and vehicles contained the largest amount of flame retardants with concentration of the sum of 10 BDE congener, was between 45-210 mg/kg. DecaBDE was the predominant congener (about 65%) (Morin et al. 2017).

37. In a study done on behalf of the Swedish Environmental Protection Agency the content of legacy chemicals in recycled plastics that have been processed in a recycling facility were assessed. The plastics originated from WEEE and ELVs and have been gathered from recyclers across Europe. In total 54 samples of ABS, PE, PP, and PS plastics collected in 2017 and 2018 were analysed. PBDEs were found in 15 samples, 14

of which contained decaBDE and three contained some combination of nona-, octa- and decaBDE (Andersson et al, 2019; see Table 5).

38. In cooperation with the UK Environment Agency, the Industry Council for Electronic Equipment Recycling (ICER) investigated the presence of PBDES in WEEE. The predominant congener present was decaBDE. Concentrations of the five POP PBDEs, were found above the maximum contaminant level of 1,000 mg/kg in TVs industrial IT equipment, printed circuit boards and thus these items would need to be treated as POP waste (see Keeley-Lopez et al, 2020 in Table 5). In a few cases, while an item as whole did not exceed this threshold, some of their components did. The study concluded that various WEEE streams are likely to be contaminated with PBDEs at levels higher than those permitted in Regulation (EU) 2019/1021 on POPs. These include waste articles ~~which~~ that had previously been considered to be ~~POPs~~ POPs-free and may have been recycled. Similar articles are expected to still be in use and will need to be dealt with at end of life (appendix I). In addition, the UK has developed a waste tool that has assessed legacy BDE articles and when they are likely to appear as waste.[6] This includes materials for automobiles, aircraft, building and construction. Further work will be undertaken to improve this waste tool and better understand articles in use.

39. A 2014 and 2015 survey of WEEE in France analysed the concentrations of BFR including PBDEs in WEEE (Hennebert and Filella, 2018). DecaBDE was the ~~more~~ most prevalent PBDE. Concentrations in WEEE were higher than those found in new EEE collected between 2009 and 2013 (Table 3 above), which is likely due to the waste stream containing older equipment. The high-bromine fraction of waste had the highest concentrations of PBDEs. “High Br High density” CRTs and “High Br” CRTs exceeded the maximum concentration limits of the EU POP regulation for the sum of POP-BDEs (Table 6).

Table 5. Summary of concentration of PBDE in various waste streams.

	Country	Collection/Sampling date	Concentrations mg/kg	n	Reference
WEEE (small and large household (cool and heat) equipment, TV, screens, IT equipment, wires, white plastics)	Not specified	--	PBDEs mean 4,023; median 50	530	Hennebert, 2018
Automobile parts (printed circuit boards; interior parts, seats, etc.)	Various	Various	Mean PBDEs 2,467 2 – 48,058	111	Hennebert, 2018
ELV (Automotive shredder residues)	Various	Various	176 16 - 5,842	52	Hennebert, 2018
ELV and WEEE (Post-shredder treatment)	Various	Various	44 1 – 1,091	33	Hennebert, 2018
WEEE	Switzerland	2003	pentaBDE: 34 octaBDE: 530	-	FOE 2017
WEEE	Switzerland	2011	pentaBDE: 2.4 +/- 0.69 octaBDE: 120 +/- 33	-	FOE, 2017
WEEE - TVs	United Kingdom	2012 (assumed)	Sum POP-BDEs Mean: 5,746 Total PBDEs Mean: 90,777	-	Cited in Keeley-Lopez et al, 2020
WEEE - Industrial IT equipment	United Kingdom	2012 (assumed)	Sum POP-BDEs Mean: 4,610 Total PBDEs	-	Cited in Keeley-Lopez et al, 2020

[6] https://www.gov.uk/government/publications/isitwaste-tool-for-advice-on-the-by-products-and-end-of-waste-tests/isitwaste-tool-user-guide

	Country	Collection/Sampling date	Concentrations mg/kg	n	Reference
			Mean: 29,073		
WEEE - Printed circuit boards	United Kingdom	2012 (assumed)	Sum POP-BDEs Mean: 4,473 Total PBDEs Mean: 26,943	-	Cited in Keeley-Lopez et al, 2020
WEEE - Digiboxes	United Kingdom	2012 (assumed)	Sum POP-BDEs Mean: 858 Total PBDEs Mean: 5,825	-	Cited in Keeley-Lopez et al, 2020
WEEE - Large household appliances	United Kingdom	2012 (assumed)	Sum POP-BDEs Mean: 512 Total PBDEs Mean: 1,951	-	Keeley-Lopez et al, 2020
Small household appliances	United Kingdom	2012 (assumed)	Sum POP-BDEs Mean: 57 Total PBDEs Mean: 847	-	Cited in Keeley-Lopez et al, 2020
Fridges	United Kingdom	2012 (assumed)	Sum POP-BDEs Mean: 39 Total PBDEs Mean: 182	-	Cited in Keeley-Lopez et al, 2020
PC monitors	United Kingdom	2012 (assumed)	Sum POP-BDEs Mean: 14 Total PBDEs Mean: 12,353	-	Cited in Keeley-Lopez et al, 2020
WEEE items	Netherlands	2013 (assumed)	<0.5–800		Leslie et al, 2016
Shredded car plastic	Netherlands	2013 (assumed)	<0.1–11		Leslie et al, 2016
Shredded car and WEEE plastic (mixed)	Netherlands	2013 (assumed)	<1–280		Leslie et al, 2016
Shredded WEEE plastic	Netherlands	2013 (assumed)	<2–330		Leslie et al, 2016
Household waste plastics	Denmark	2013	POP-BDEs Frequency of detection BDE-47: 5% BDE-85: 5% BDE-99: 10% BDE-100: 5% BDE-153: 5% BDE-154: 0%	20 (100 households)	Pivnenko et al., 2017
ELV and WEEE (plastic fraction)	Norway	2013, 2014	Σ_{10}PBDE 45-210	15	Morin et al., 2017
WEEE	France	2014	TetraBDE: 7 PentaBDE: 8 HexaBDE: 84 HeptaBDE: 405	33	Hennebert and Filella, 2018
WEEE	France	2015	TetraBDE: 11 PentaBDE: 13 HexaBDE: 162 HeptaBDE: 908	32	Hennebert and Filella, 2018
ELV (automotive shredder residues)	Ireland	2014	Sum POP-BDEs 0.103 – 0.197	2	As cited in European Commission, 2019

	Country	Collection/Sampling date	Concentrations mg/kg	n	Reference
Construction and demolition waste	Ireland	2015-16	Σ_9PBDEs 8.1 (mean) Range <0.0003 – 1,400 (detected in 56 %)	62	Drage et al., 2018
ELV (fabrics and PUR ~~F~~foam)	Ireland	2015-16	Σ_9PBDEs 0.09 (median) Range: <0.0008 – 740 (detected in 98 out of 119 samples)	135	Drage et al., 2018
Soft furnishings	Ireland	2015-16	Σ_9PBDEs 0.058 (median) Range: <0.0003 – 160 (93 out of 122 soft furnishing samples)	123	Drage et al., 2018
WEEE	Ireland	2015-16	Σ_9PBDE <0.0003 (median) Range: <0.0003 – 1400 (detected in 110 out of 237 samples)	239	Drage et al., 2018
ELV and WEEE	Europe: Austria, France, Germany, Norway, France, Slovakia, Spain, Sweden, United Kingdom	2017	POP-BDEs <5-16	50	Stråat and Nilsson, 2018
ELV and WEEE	Europe: Austria, France, Germany, Netherlands, Norway, Slovakia, Sweden, United Kingdom	2017-2018	HeptaBDE <5-58 NonaBDE: <5-163	54	Andersson et al., 2019
WEEE plastic TV housings	China	2018?	Σ_{15}PBDE 19.03 (mean)		Li et al. 2019
WEEE plastic PC housings	China	2018?	Σ_{15}PBDE 2.99 (mean)		Li et al. 2019
WEEE plastic washing machine housings	China	2018?	Σ_{15}PBDE 4.09 (mean)		Li et al. 2019
WEEE plastic	China	2018?	Σ_{15}PBDE 39.87 (mean)		Li et al. 2019
WEEE - Interior cables	England and Wales	2019	5 POP-PBDEs 14 - 26,020 2 items 1,000 ≤ DecaBDE: 14 - 23,333	7	Keeley-Lopez et al, 2020
WEEE - Exterior cables	England and Wales	2019	5 POP-PBDEs 0 – 1,456	13	Keeley-Lopez et al, 2020

	Country	Collection/Sampling date	Concentrations mg/kg	n	Reference
			1 item 1,000 ≤ DecaBDE: 0 - 1,453		
WEEE - Printed circuit boards	England and Wales	2019	5 POP-PBDEs 0 - 880 DecaBDE: 0 - 754	20	Keeley-Lopez et al, 2020
WEEE - CRT	England and Wales	2019	5 POP-PBDEs 1 - 112,633 9 samples 1000 ≤ DecaBDE: 0 - 8,703	16 and 2 blended	Keeley-Lopez et al, 2020
WEEE - Flat panel displays	England and Wales	2019	5 POP-PBDEs 1- 6,963 3 items 1000 ≤ DecaBDE: 0 - 4,779	28	Keeley-Lopez et al, 2020
WEEE - Fridge components	England and Wales	2019	5 POP-PBDEs 1- 58,671 9 components 1000 ≤ DecaBDE: 0 - 56,690	31	Keeley-Lopez et al, 2020
WEEE - Large domestic appliances	England and Wales	2019	5 POP-PBDEs 0 – 13,446 4 components: 1000 ≤ DecaBDE: 0 - 10,347	32 components	Keeley-Lopez et al, 2020
Small mixed WEEE	England and Wales	2019	5 POP-PBDEs 2 - 23,883 Blended sample: 2510 5 components and blended sample 1000 ≤ DecaBDE: 0 - 21,255	25 components and one blended sample	Keeley-Lopez et al, 2020
Office equipment	England and Wales	2019	5 POP-PBDEs 0 – 273 DecaBDE: <1 - 255	25 components	Keeley-Lopez et al, 2020

Table 6. Sum POP-BDEs (mg/kg) in various fractions of WEEE collected in France in 2014 and 2015 (Hennebert and Filella, 2019)

Inflow			Fines	Low Br			High Br Low density		High Br High Density		High Br		
SHA	CRT	Flat screens	SHA	SHA	CRT	Flat screens	SHA	CRT	SHA	CRT	SHA	CRT	screens
Year: 2014													
28	139	12	82	9	14	4	30	114	248	2500	810	2009	33
Year: 2015													
58	456	10	--	25	113	6	237	696	250	10362	547	1829	59

SHA = Small household appliances; CRT = cathode ray tubes; Br = bromine

40. The results of these studies are indicative of a continued decrease of POP-BDEs in the waste stream in European countries. Conclusions about trends in different countries or different regions need to be drawn with caution given the limited number of data points available.

B. Measures to dispose of waste articles containing POP-BDEs

41. As outlined above, the bulk of articles containing POP-BDEs in countries where they have mainly been manufactured and used is predicted to have entered the waste stream. Article 6 of the Stockholm Convention provides that articles containing POP-BDEs, upon becoming wastes, are to be managed by Parties in a manner protective of human health and the environment.

42. With regard to POP-BDEs, 12 Parties specified in their fourth national report that they had taken measures to manage wastes, including products and articles upon becoming wastes, in accordance with paragraph 1(d) of Article 6 of the Convention (appendix II).

1. Management of waste articles containing c-octaBDE

43. The major use of c-octaBDE has been in the manufacture of EEE, namely in the plastic casings of televisions and computer monitors. In 2019, the global amount of WEEE generated was 53.6 Mt or 7.3 kg/person, and increase of over 20 % since 2014 (Forti et al. 2020). This amount is projected to continue to grow to 74.7 Mt by 2030. About 17.4% of this waste or 9.3 Mt was collected and recycled properly in 2019 leaving 82.6 % or 44.3 Mt undocumented. Europe was the continent with the highest collection and recycling rate (42.5 %) and Africa the lowest (0.9 %) (Table 7). In high-income countries, an estimated 8 % WEEE is discarded in waste bins.

Table 7. Amount of WEEE generated and documented to be collected and properly recycled in 2019 by continent (Forti et al., 2020)

	Africa	**Americas**	**Asia**	**Europe**	**Oceania**
Amount of WEEE generated	2.9 Mt 2.5 kg/person	13.1 Mt 13.3 kg/person	24.9 Mt 5.6 kg/person	12 Mt 16.2 kg/person	0.7 Mt 16.1 kg/person
Amount of WEEE documented to be collected and properly recycled (percent)	0.03 Mt (0.9 %)	1.2 Mt (9.4 %)	2.9 Mt (11.7 %)	5.1 Mt (42.5 %)	0.06 Mt (8.8 %)
Number of countries with national WEEE legislation/ policy or regulation in place	13	10	17	37	1

44. In Europe, the majority of e-waste is regulated by the WEEE Directive (2012/19/EU) in force in the European Union and in Norway. Other countries such as Switzerland, Serbia and Bosnia and Herzegovina have similar laws. In Belarus, WEEE is managed within an extended producer responsibility (EPR) framework. In Moldova, an EPR on e-waste was approved in 2018 under the national strategy on waste. Russia introduced an EPR mandate for electrical and electronic scrap in 2017, and the Ukraine is developing an EPR system based on the EU WEEE Directive (Forti et al., 2020). An update of the Dutch WEEE Flows (Baldé et al., 2020) found that, in the Netherlands, WEEE generated increased from 324 kt in 2010 to 366 kt in 2018. In 2018, half of that WEEE was recycled in compliance with regulations; about one quarter recycled, but not in compliance and the other quarter disposed of in waste bins or exported for reuse, or could not be documented.

45. The federal government of Canada does not have jurisdiction over WEEE. Twelve of the 13 provinces/territories have regulations in place, many of which include EPR requirements (Forti et al., 2020).

46. While there has been progress, only a few countries in Latin America have WEEE laws in place (Forti et al, 2020). Several countries are currently developing EPR schemes applicable to WEEE or extending the scope of existing ones. For example, Chile is developing WEEE regulations under its “Framework Law on Waste Management, Extended Producer Responsibility, and Promotion of Recycling”.

47. WEEE management in Africa is dominated by the informal sector with minimal government oversight. No organized take-back systems nor license provisions for sorting and dismantling e-waste exist. There are formal recycling facilities in place in a few countries, such as South Africa, Morocco, Egypt, Namibia, and Rwanda. However, they co-exist with of a large informal sector (Forti et al., 2020).

48. The e-waste management systems found in Asia are very varied with some countries such as Japan and South Korea, having advanced e-waste regulations and infrastructure, China with both a growing formal system alongside an informal one, and other countries where the informal sector dominates. China has national legislation in force that regulates the collection and treatment of fourteen types of e-waste. India adopted laws to manage e-waste in 2011 requiring e-waste to be collected by authorised dismantlers and recyclers (Forti et al., 2020). In Sri Lanka, it is scheduled to introduce EPR to assure environmentally friendly management of WEEE (appendix I). Most countries of Southeast Asia have a regulatory framework in place. In Central Asia, most of e-waste generated ends up in landfills or dumped illegally and in Western Asia, the e-waste management system is mostly informal (Forti et al., 2020).

49. In Australia, the National Television and Computer Recycling Scheme (NTCRS) was implemented under the Product Stewardship Act 2011. During the 2017-2018 financial year, the plan recycled approximately 58 kt of e-waste, equating to a recovery rate greater than 93%. New Zealand has no formalized system for WEEE management and more than 98% of generated household e-waste ends up in landfills. A mandatory plan for WEEE is under consideration. The Pacific Islands region, which consists of 22 countries and territories, faces unique challenges due to geography and limited waste management capacity (Forti et al., 2020).

2. Management of waste articles containing c-pentaBDE

50. The main use of c-pentaBDE has been in PUR foams for the manufacture of furniture (in North America) and seats of vehicles. As noted in UNEP/POPS/COP.8/INF/12, the disposal and recycling of ELV is well regulated in many countries in Europe, Japan and the Republic of Korea (BiPRO, 2016). In these and other developed countries, the typical ELV treatment consists of a dismantling and depollution phase after which the car hulk is processed through shredders. PUR foam that may contain POP-BDEs ends up in the shredder outputs, the so-called automotive shredder residue (ASR). In the majority of developing countries, the disposal of ELV is unregulated and undertaken by the informal sector.

51. In Europe the accumulated amount of c-pentaBDE in upholstery applications was estimated to have been 321 t in 2010 and 0 in 2014. By 2014, all c-pentaBDE in upholstery applications in Europe should have already entered the waste stream. Of the 91.3 t of c-pentaBDE used in upholstery that entered in the waste stream in 2010, about 67% was landfilled, 20% incinerated without energy recovery and 13% incinerated with energy recovery (European Commission, 2019).

52. Given that the use of c-pentaBDE in Europe ceased in 2000 and that the lifespan of a vehicle is about 12 years, the majority of c-pentaBDE in automotive applications is expected to have already entered the waste stream in Europe (European Commission, 2019). There may be some variability across Europe – for example, in Bulgaria, over 57% of cars are over 15 years old. Of the 243.3 t of c-pentaBDE present in automotive waste in 2010, about 40% of c-pentaBDE in automotive waste was landfilled, 40% incinerated without energy recovery, 7% incinerated with energy recovery and about 12% recycled.

53. As indicated in document UNEP/POPS/COP.8/INF/12, for the most part, the disposal of ELV and their contents in developing countries is characterized by a lack of appropriate regulation, enforcement and infrastructure (BiPRO, 2016). For example, in Brazil (Brazil, 2015), following dismantling of ELV to recover valuable parts in the informal sector, the remaining car hulks including the car seats, are abandoned in junkyards for long periods of time. In Senegal, the PUR foam from disposed cars are recovered and reused/recycled into furniture and in cold-storage (Senegal, 2016). In Nigeria, much of the foam from discarded cars are likely to be disposed of by open burning (Babayemi et al., 2016). The lack of avenues for the environmentally sound disposal of ELV in developing countries is supported by the information provided by several countries in the BDEs questionnaire (appendix I).

3. Environmentally sound methods for the disposal of waste articles containing POP-BDEs

54. Article 6 of the Stockholm Convention provides that the COP shall cooperate with the appropriate bodies of the Basel Convention to determine what they consider to be the methods that constitute environmentally sound disposal. At its twelfth meeting, the COP of the Basel Convention adopted the Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with hexabromodiphenyl ether and heptabromodiphenyl ether, or tetrabromodiphenyl ether and pentabromodiphenyl ether (UNEP, 2015b). Updated guidelines were adopted by the Basel Convention COP in 2019 (UNEP, 2019a). The following three methods are listed in the guidelines for the destruction and irreversible transformation of wastes with a PBDE content above 50 mg/kg or 1000 mg/kg as a sum of hexaBDE, heptaBDE, pentaBDE and tetraBDE: hazardous waste incineration, cement kiln co-incineration, and thermal and metallurgical production

of metals. When neither destruction nor irreversible transformation is the environmentally preferable option, specially engineered landfills may be used.

55. According to the General technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with POPs (UNEP, 2019b), the application of these technologies should meet the requirements described in the Guidelines on best available techniques (BAT) and provisional guidance on best environmental practices (BEP) relevant to Article 5 and Annex C of the Stockholm Convention (UNEP, 2007).

56. As noted in document UNEP/POPS/COP.8/INF/12, while the number of waste incinerators is increasing globally, including in developing countries (ISWA, 2013), these may not meet the BAT requirements for the destruction of wastes containing POP-BDEs. For example, there are many facilities that incinerate hazardous wastes, including cement kilns, in China (PRC, 2007) and India (2011) but the majority have not adopted BAT/BEP technologies. Cement kilns are prevalent in developing countries and are being used increasingly for the co-combustion of hazardous wastes (UNEP, 2015a). However, their design and operation may not meet the standards for the environmentally sound destruction of POPs (UNEP, 2017). For these reasons, cement kilns in Ethiopia and neighbouring countries were not considered appropriate for the final disposal of plastics from WEEE (Manhart et al, 2013). The establishment of state-of-the-art metal smelters with stringent pollution control technologies is very expensive and only a few such plants are in operation worldwide in developed countries (UNEP, 2017). The landfills/dumpsites that are commonly used in developing countries to dispose of plastics and foam that may contain POP-BDEs are often not equipped with the safeguards necessary to prevent releases of POP-BDEs to the environment (Kwan et al., 2013; Olukunle et al., 2015).There are reports of projects to pilot test the co-processing of waste containing flame retardants (SRI, 2016) and other POPs wastes in cement kilns (UNIDO, 2018).

4. Measures to prevent the recycling of articles containing POP-BDEs

57. A number of technologies have been identified that could potentially separate plastic fractions containing POP-BDEs from WEEE to prevent the recycling of these chemicals (UNEP, 2017). As summarized in UNEP/POPS/COP.8/INF/12 the separation of fractions containing POP-BDEs specifically is considered too complex and costly to be used at an industrial scale. Instead, in Europe, screening is undertaken for bromine, to identify and segregate fractions containing all BFRs. For that purpose, the following methods are used in the Swedish recycling industry (Retegan et al., 2010): written instructions/guidelines for the operators at the pre-treatment plant; worker training and experience for manual sorting of WEEE; density-dependent separation (sink-float); regular monitoring of BFR levels using handheld X-ray fluorescence (XRF) apparatus. In Norway, some waste treatment plants use sensor-based technology to detect bromine content and to sort the plastic in bromine- and non-bromine containing fractions. The bromine containing plastic is incinerated as hazardous waste. The non-bromine containing plastics is recycled. The technology does not differentiate between different brominated substances (appendix I). In the UK, various techniques are used to identify and separate waste articles containing waste articles containing PBDEs ~~in the UK~~. These include, but are not limited to, visual, intelligence-based identification and manual separation; and separation via sink-float density technology (appendix I).

58. As indicated in UNEP/POPS/COP.8/INF/12, off-the-shelf technologies are currently commercially available for the separation of plastics containing BFRs (Baxter et al., 2014). Harmann et al. (2020) recently undertook an assessment of various technologies for separating plastics containing BFR, as summarized in table 8.

~~Factors that impede the wide adoption of separation technologies include the high cost of capital or operation and insufficient economic incentives (Baxter et al., 2015). A few large facilities capable of separating plastics containing BFRs are operational in EU member countries including Austria, the United Kingdom, France and Germany. It is unclear whether the capacity of WEEE recycling plants for separating plastics containing BFRs is sufficient to process all potentially impacted WEEE plastic in the EU and it would appear that not all European WEEE recycling plants have bought appropriate equipment to identify and separate BFR containing plastic waste from other plastic waste (European commission, 2019). In Norway, waste treatment plants without the appropriate sorting technologies in place must, based on an assessment of risk, destroy any fractions that contain POP-BDEs (appendix I).~~ ~~Table 8 summarizes methods that are potentially effective to separate plastics that contain BFRs.~~

Table 8. Overview of BFR plastic sorting technologies (Haarman et al., 2020)

Method		Based on	Effectiveness	Selectivity	TRL*	Cost
ISO markings	Manual	FR content according to ISO markings	– –	+	+ +	– –.
Source segregation	Manual	Knowledge of BFR hotspots	– –	+	+ +	– –

Sink/Float	On-line	Density of flakes	+ +	– –	+ +	+ +
X-ray transmission (XRT)	On-line	Atomic composition	+	–	+ +	+
Laser-Induced Breakdown Spectroscopy (LIBS)	Manual		?	?	+	?
	Online		?	?	–	?
X-ray fluorescence (XRF)	Manual	Atomic composition	+ +	+ +	+ +	– –
	On-line		+ +	+ +	+	–

* Technology readiness level

~~58.~~59. XRF has been found to be a robust tool for high-throughput non-destructive identification of consumer products containing BFRs (estimated 92% accuracy). If there is a need to identify specific BFRs, it is possible to combine XRF with a surface wipe method to provide an initial estimate of the concentration of specific BFRs, such as c-octaBDE, in plastic products with an estimated 81% accuracy (Gallen et al., 2014). A survey of plastic wastes undertaken in 2014 and 2015 validated the use of XRF as a method to sort WEEE (Hennebert and Filella, 2018).

60. While a handheld XRF cannot identify the specific brominated substances in plastics it can quickly give information about metal and bromine content to around 10 - 50 ppm. As long as the measured bromine concentration is below 1,000 ppm, the total amount of PBDEs will be lower than 160 ppm (Andersson et al., 2019). Expressing limit values for BFRs in waste materials in terms of Br rather than BFR concentration (based on a conservative assumption about the BFR present) could provide an accurate, yet rapid and inexpensive technique capable of monitoring compliance with limit values on site (Guzzonato, et al., 2016).

61. Density sorting is an effective way to separate WEEE and create a fraction that contains less than 1,000 ppm PBDEs. The high-density fraction which contains more than 95% of the original BFR content, including PBDEs, can then be appropriately disposed of. ~~Given the decreasing share of restricted BFRs to total Br content in Europe, it is expected that waste containing as much 6,000 ppm BR would contain less than 1,000 ppm PBDEs~~ (Haarman et al., 2020).

62. Factors that impede the wide adoption of separation technologies include the high cost of capital or operation and insufficient economic incentives (Baxter et al., 2015). A few large facilities capable of separating plastics containing BFRs are operational in EU member countries including Austria, the United Kingdom, France and Germany. It is unclear whether the capacity of WEEE recycling plants for separating plastics containing BFRs is sufficient to process all potentially impacted WEEE plastic in the EU and it would appear that not all European WEEE recycling plants have bought appropriate equipment to identify and separate BFR containing plastic waste from other plastic waste (European commission, 2019). In Norway, waste treatment plants without the appropriate sorting technologies in place must, based on an assessment of risk, destroy any fractions that contain POP-BDEs (appendix I).

~~59.~~63. Separation of plastics containing BFRs is not a priority for the informal WEEE and plastic recycling sector in developing countries but a study shows that a combination of worker experience and density-dependent separation method can be used to achieve high separation efficiency in the informal plastic recycling sector in India (Haarman, 2016). Another study found a combination heat treatment and froth flotation technique to be a simple, effective, economic method to remove ABS plastic wastes containing BFRs from other heavy plastic materials (Truc et al., 2015).

5. Transport of waste articles containing POP-BDEs across international boundaries

~~60.~~64. As noted in document UNEP/POPS/COP.8/INF/12, for the majority of developing countries imports have constituted the main source of articles containing POP-BDEs. In addition to new articles, developing countries also received articles that may contain POP-BDEs in the form of second-hand/used goods and as wastes, originating mainly from developed countries. Inventories of POP-BDEs and WEEE conducted in several countries attest to the presence of articles that may contain POP-BDEs, either in stockpiles or as waste (Babayemi et al, 2015; see also appendix III).

~~61.~~65. As noted in document UNEP/POPS/COP.8/INF/12, a significant portion of WEEE generated in developed countries are exported, sometimes illegally, to developing countries. Accurate information about the magnitude of such export is difficult to obtain, partly because the exported items are collected outside of the official collection channels and therefore not subject to statistical reporting (Baldé et al, 2015). There continues to be concern over the transboundary flows of WEEE, but limited data available on imports and exports of such waste make it difficult to fully assess the situation. Available information suggests that the transboundary movements of used EEE or WEEE is in the range of 7-20% of EEE waste generated (Forti et al., 2020). A study estimated that of the 9.5 Mt of WEEE generated in 2012 in the EU, 15.8 % (1.5 Mt) was exported and 1.3 Mt departed the EU in undocumented exports (Forti et al, 2020). A large amount of used and end-of-life EEE

declared as still functioning EEE is thought to be illegally exported to countries outside the EU (European Commission, 2019).

~~62.~~66. Despite declining levels of POP-BDEs in articles put on the market in developed countries, POP-BDEs may still be~~ing~~ imported into developing countries in used articles. -In the USA it was estimated that 8.5% of the used EEE products generated in 2010 were exported. Another study using 2011 data suggests that 7% of used EEE were exported. A 2013 study estimated that about 15% of used EEE was exported for reuse from the EU. About 30% of the EEE exported for reuse is thought to be waste (Forti et al., 2020). A study conducted in Nigeria shows that approximately 60,000-71,000 t of used EEE were imported annually into Nigeria through the two main ports in Lagos in 2015 and 2016. It was found that most of the imports was shipped from developed countries such as Germany, UK, Belgium, USA. Additionally, a basic functionality test showed that, on average, at least 19% of devices were non-functional (Odeyingbo et al., 2017).

~~63.~~67. The three largest exporters of used vehicles, the EU (54%), Japan (27%), and the USA (18%), exported a total of 14 million used light duty vehicles between 2015 and 2018 according to the Global trade in used vehicles report (UNEP, 2020). It found that only 66 of 146 countries studied included a limit on the age of imported vehicles, which varied between 3 to 15 years. Most of vehicles exported from the Netherlands in 2017 and 2018 were between 16 and 20 years old, which would imply that they could still contain parts containing POP-BDEs.

IV. Conclusions

~~64.~~68. This report provides information that has become available since 2015 when the report for the evaluation and review of brominated diphenyl ethers listed in Annex A to the Stockholm Convention (UNEP/POPS/COP.8/INF/12) was prepared by the Secretariat to assist the COP in undertaking the evaluation and review of POP-BDEs at its eighth meeting. Decision SC-8/4 on evaluation and review of brominated diphenyl ethers pursuant to paragraph 2 of parts IV and V of Annex A to the Stockholm Convention took note of the report and urged Parties to undertake a number of measures.

~~65.~~69. In decision SC-8/4, the COP encouraged Parties to collect information on the types and quantities of brominated diphenyl ethers in articles in use and in the waste and recycling stream and on measures taken to ensure their environmentally sound management pursuant to Article 6 of the Convention and, where appropriate, parts IV and V of Annex A to the Convention and to make that information available to the Secretariat.

~~66.~~70. As of 1 October 2020, 78 Parties had submitted their fourth national report. Information from these reports indicates that 65 Parties have prohibited and/or taken legal and administrative measures necessary to eliminate releases from intentional production and use of POP-BDEs. Taking into account both the phase-out dates of POP-BDEs in developed countries where POP-BDEs were the most heavily used and the measures taken by many Parties to eliminate releases from intentional production and use of POP-BDEs, it could be expected that articles entering the market in recent years would not contain POP-BDEs. Taking into account the lifespan of articles in which POP-BDEs had historically been incorporated, it could be expected that a large share of such articles would already have reached their end-of-life and entered the waste stream in developed countries.

~~67.~~71. A few Parties referred the Secretariat to studies undertaken in their country but overall little specific information on levels of PBDEs in articles was provided through the BDEs questionnaire (appendix I). A few studies have become available in the scientific literature on levels POP-BDEs in articles and in the waste stream since 2016 (section II.C and III.A, respectively). While the information available from these sources is fragmented and does not provide a comprehensive picture, it suggests that that levels of POP-BDEs in articles on the market in developed countries (namely Europe) have decreased to quite low levels. This decrease is mirrored by a decrease in levels of POP-BDEs in the waste stream. While, when detected, levels of POP-BDES in articles are generally below 100 mg/kg, there are instances where levels are above 1,000 mg/kg. A recent study in the UK detected unexpectedly high levels of POP-BDEs in EEE and WEEE, which could be the result of recycling of plastic waste containing POP-BDEs.

~~68.~~72. Inventories of POP-BDEs undertaken in developing countries point to significant stocks of POP-BDEs in articles in use or stockpiled and significant amounts of POP-BDEs in the waste stream (appendix III). For the majority of developing countries past imports have constituted the main source of articles containing POP-BDEs. While the import of new articles containing POP-BDEs may be less a concern in recent years, developing countries continue to receive articles that may contain POP-BDEs in the form of second-hand/used goods and as wastes.

~~69.~~73. The major use of c-octaBDE has been in the manufacture of EEE, namely in the plastic casings of televisions and computer monitors. A recent study estimates that globally about 17.4% of WEEE was collected and recycled properly in 2019 leaving 82.6 % undocumented. Formal systems to collect and dispose of WEEE, including through recycling, are more prevalent in developed countries and are gradually being introduced or

strengthened in developing countries. The main use of c-pentaBDE has been in PUR foams for the manufacture of furniture (in North America) and seats of vehicles. The disposal and recycling of ELV is well regulated in many developed countries where PUR foam that may contain POP-BDEs ends up in automotive shredder residue, which is further incinerated or ~~land-filled~~landfilled. In the majority of developing countries, the disposal of ELV is unregulated and undertaken by the informal sector. Given the presence of significant stocks of POP-BDEs estimated to exist in articles in use and in the waste stream in developing countries, the lack of capacity to ensure the environmentally sound management of waste that may contain POP-BDEs remain a major impediment to progress in their elimination.

~~70.~~74. Decision SC-8/4, recalling decision SC-5/5, urged Parties and other relevant stakeholders to implement where appropriate, taking into account national circumstances, the recommendations set out in the annex to decision POPRC-6/2 on the elimination from the waste stream of brominated diphenyl ethers. Various methods are available for identifying waste that contain bromine and allow the screening of fractions that may contain POP-BDEs. Various methods to segregate fractions containing bromine, such as visual, intelligence-based identification, manual separation, sink-float density technology and sensor-based methods are available and applied at commercial scale in waste management facilities in Europe. The widespread application of such methods may be hampered by economic considerations. In some countries such as Norway, waste treatment plants without the appropriate sorting technologies in place must, based on an assessment of risk, destroy any fractions that may contain POP-BDEs.

~~71.~~75. Decision SC-8/4 noted from document UNEP/POPS/COP.8/INF/12 that brominated diphenyl ethers have been detected in a range of articles in use, including plastic toys that are not subject to flammability requirements, which suggests that their presence is unintentional and possibly a consequence of the recycling of plastics containing brominated diphenyl ethers and urged Parties to take determined steps to ensure that POP-BDEs are not introduced into articles in which their presence would pose a risk of human exposure, in particular consumer products such as children's toys. A few recent studies reveal the presence of low but detectable levels of POP-BDEs in toys placed on the European market. A recent modelling study estimated that from the 180 kt of PBDEs produced, 25 kt were still present in articles in use in 2018. Without improved waste management measures, it is estimated that 5 kt of these PBDEs could end up in recycling processes and reappear in plastic articles.

~~72.~~76. Since the COP last undertook the evaluation and review of POP-BDEs at its eighth meeting, one party has registered for specific exemptions for POP-BDEs and two Parties have withdrawn their registrations for such exemptions. Since then, there have been a significant increase in the number of Parties submitting updated NIPs suggesting that many Parties from developing countries have only recently taken stock of their situation regarding the presence of POP-BDEs and may be in the process of taking measures to address them. While many of these countries do not yet have the capacity to collect and treat waste that may contain POP-BDEs, there are efforts and progress towards strengthening these capacities, in order to enhance the environmentally sound management of waste streams such as WEEE and as part of growing initiatives for achieving a circular economy. Unless waste containing POP-BDEs are effectively removed from the recycling stream, increasing recycling rates could result in a continued flow of POP-BDEs into new articles in these countries and countries to which such articles are exported.

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Appendix I

Compilation of submissions by Parties of information for the evaluation and review of brominated diphenyl ethers pursuant to paragraph 2 of parts IV and V of Annex A to the Stockholm Convention. (The information is presented as submitted by Parties and received by the Secretariat before 20 April 2020 and has not been edited).

Question 1: Please indicate whether your country is registered for a specific exemption related to brominated diphenyl ethers in accordance with part IV and/or part V of Annex A to the Stockholm Convention.

~~Party~~Respondent	Response	If Yes, information on whether your country has undertaken any review of its continuing need for registration of the continued need for a specific exemption.	If No, reasons provided.
Australia	No		Not needed
Austria	Yes for hexaBDE and heptaBDE. Yes for tetraBDE and pentaBDE	The Regulation implementing the Stockholm Convention in the European Union was recently recast as Regulation (EU) 2019/1021. In this Regulation the unintentional trace contaminant Limit value for the sum of BDEs in mixtures or articles was set at 500 mg/kg. This value has to be reviewed by the European Commission till 16 June 2021.	
Bosnia and Herzegovina	No	.	Assessed but lack of technical capacity, lack of financial capacity, lack of human resources.
Bulgaria	No		Not needed
Cameroon	No		Assessed but lack of technical capacity, lack of financial capacity, lack of human resources.
Canada	No		Not needed
Chile	No		Chile no produce estos productos químicos, sin embargo, no contamos con información que descarte la presencia en el país de artículos que puedan contener estos compuestos, debido a la falta de capacidad técnica, recursos financieros y humanos para tales efectos.
Côte d'Ivoire	Not answered		
Estonia	No		Information on specific exemptions to the Secretariat has been communicated through European Union.

~~Party~~Respondent	Response	If Yes, information on whether your country has undertaken any review of its continuing need for registration of the continued need for a specific exemption.	If No, reasons provided.
Germany	No		In the European Union, both the EU and the Member States are Parties to the Stockholm Convention. Thus, not the individual member states but the EU registers for specific exemptions or acceptable purposes. The EU has registered for specific exemptions for hexa- and heptaBDE as well as for tetra- and pentaBDE.
Guyana	No		Not needed
Hungary	No		Assessed but lack of technical capacity, financial capacity, human resources
Kyrgyzstan	No		Not assessed due to lack of financial resources and technical capacity.
Lebanon	Not answered		
Luxembourg	No		Not needed
Maldives	No		Not needed
Mauritius	No		Not needed
Mexico	No		Assessed but lack of financial capacity.
Monaco	No		Not needed
Montenegro	No		Not needed
New Zealand	No		Not needed
Norway	No		Not needed
Peru	No		Not assessed due to lack of technical capacity.
Poland	No		Not needed
Portugal	No		Not needed
Romania	No		Assessed but lack of technical capacity and/or lack of financial capacity and/or lack of human resources.

~~Party~~Respondent	Response	If Yes, information on whether your country has undertaken any review of its continuing need for registration of the continued need for a specific exemption.	If No, reasons provided.
Russian Federation[1]	No		Assessed but lack of technical capacity and financial capacity.
Sao Tome and Principe	No		Not assessed due to a lack of financial resources and technical capacity.
Serbia	No		Not needed
Spain	Not answered		
Sri Lanka	No		Preliminary inventory of PBDEs was developed within the process of revising NIP. Sri Lanka does not produce PBDE. However environmentally sound management of PBDE is necessary.
Suriname	No		Not needed
Switzerland	No		Not needed
Thailand	No		Not assessed due to a lack of technical capacity.
Turkey	Yes for hexaBDE and heptaBDE. Yes for tetraBDE and pentaBDE	There is still need for further assessment of inventories as well as consultation with industry.	
United Kingdom	No		Not needed
United States	Not answered		
Zimbabwe	No		Not assessed due to a lack of financial resources and a lack of technical capacity.

[1] All information presented is from an informal translation from Russian.

Question 2: Has your country taken any actions or control measures to eliminate brominated diphenyl ethers contained in articles?

~~Party~~Respondent	Response	HexaBDE and heptaBDE – actions/control measures and year	TetraBDE and pentaBDE – actions/control measures and year	If No, reasons provided
Australia	Yes	OctaBDE was removed from the Australian Inventory of Chemical Substances (AICS)in 2007. The manufacture of the chemical in Australia and the importation into the country are not permitted, except as a laboratory standard for analytical determination.	OctaBDE was removed from the Australian Inventory of Chemical Substances (AICS)in 2007. The manufacture of the chemical in Australia and the importation into the country are not permitted, except as a laboratory standard for analytical determination.	
Austria	Yes	2006: Placing on the market and use of pentabromodiphenyl ether and octabromodiphenyl ether have been restricted in the Union by virtue of Annex XVII to Regulation (EC) No 1907/2006 with a maximum concentration limit of 0,1 % by weight below which it is not considered restricted. 2010: By Commission Regulation 757/2010 (a Regulation amending the POP Regulation 850/2004) the maximum concentration Limit of 0,1% by weight was restricted further to recycled articles. Otherwise an Unitentional trace contamination limit value of below 10 mg/kg (0,001 % by weight) applied when it occured in substances, preparations, articles or as constituents of the flame-retarded parts of articles. 2019: the unintentional trace contaminant Limit value for the sum of all BDEs (tetra to deca BDE) in mixtures or articles was set at 500 mg/kg (0,05%). This value has to be reviewed by the European Commission till 16 June 2021.	2006: Placing on the market and use of pentabromodiphenyl ether and octabromodiphenyl ether have been restricted in the Union by virtue of Annex XVII to Regulation (EC) No 1907/2006 with a maximum concentration limit of 0,1 % by weight below which it is not considered restricted. 2010: By Commission Regulation 757/2010 (a Regulation amending the POP Regulation 850/2004) the maximum concentration Limit of 0,1% by weight was restricted further to recycled articles. Otherwise an Unitentional trace contamination limit value of below 10 mg/kg (0,001 % by weight) applied when it occured in substances, preparations, articles or as constituents of the flame-retarded parts of articles. 2019: the unintentional trace contaminant Limit value for the sum of all BDEs (tetra to deca BDE) in mixtures or articles was set at 500 mg/kg (0,05%). This value has to be reviewed by the European Commission till 16 June 2021.	
Bosnia and Herzegovina	Yes	Not answered	Not answered	
Bulgaria	Currently being developed			
Cameroon	No			Lack of financial resources. Lack of technical capacity.
Canada	Yes	The manufacture, use, sale, offer for sale and import of hexabromodiphenyl ether and heptabromodiphenyl ether are prohibited in	The manufacture, use, sale, offer for sale and import of tetrabromodiphenyl ether and pentabromodiphenyl ether are prohibited in Canada	

~~Party~~Respondent	Response	HexaBDE and heptaBDE – actions/control measures and year	TetraBDE and pentaBDE – actions/control measures and year	If No, reasons provided
		Canada by the Prohibition of Certain Toxic Substances Regulations, 2012 with a limited number of exemptions	by the Prohibition of Certain Toxic Substances Regulations, 2012 with a limited number of exemptions.	
Chile	Currently being developed			
Côte d'Ivoire	Not answered			
Estonia	Yes	There are regulations in place regarding the manufacturing, placing on the market, use, stockpiles and waste handling of persistent organic pollutants. There is also chemical legislation and product specific regulation in place, e.g. for electric and electronic equipment.	There are regulations in place regarding the manufacturing, placing on the market, use, stockpiles and waste handling of persistent organic pollutants. There is also chemical legislation and product specific regulation in place, e.g. for electric and electronic equipment.	
Germany	Yes	will be filled in later	will be filled in later	
Guyana	No			Lack of financial resources. Lack of technical capacity.
Hungary	Currently being developed			
Kyrgyzstan	No			Lack of financial resources. Lack of technical capacity.
Lebanon	Not answered			
Luxembourg	Yes	2004: Interdiction de la mise sur le marché et de l'utilisation. Règlement grand-ducal du 30 avril 2004 portant quinzième modification de l'annexe 1 de la loi modifiée du 11 mars 1981 portant réglementation de la mise sur le marché et de l'emploi de certaines substances et préparations dangereuses. 2006: Limitation d'utilisation dans les équipements électriques et électroniques.	2004: Interdiction de la mise sur le marché et de l'utilisation. Règlement grand-ducal du 30 avril 2004 portant quinzième modification de l'annexe 1 de la loi modifiée du 11 mars 1981 portant réglementation de la mise sur le marché et de l'emploi de certaines substances et préparations dangereuses. 2006: Limitation d'utilisation dans les équipements électriques et électroniques. Règlement grand-ducal du 18 janvier 2005 relatif	

~~Party~~Respondent	Response	HexaBDE and heptaBDE – actions/control measures and year	TetraBDE and pentaBDE – actions/control measures and year	If No, reasons provided
		Règlement grand-ducal du 18 janvier 2005 relatif aux déchets des équipements électriques et électroniques ainsi qu'à la limitation d'emploi de certains de leurs composants dangereux. 2010: Interdiction de la production, de la détention, de la mise sur le marché et de l'utilisation. Convention de Stockholm sur les polluants organiques persistants, faite à Stockholm, le 22 mai 2001. – Adoption et entrée en vigueur d'amendements aux annexes A, B et C. Règlement (CE) n°850/2004, repealed by Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants	aux déchets des équipements électriques et électroniques ainsi qu'à la limitation d'emploi de certains de leurs composants dangereux. 2010: Interdiction de la production, de la détention, de la mise sur le marché et de l'utilisation. Convention de Stockholm sur les polluants organiques persistants, faite à Stockholm, le 22 mai 2001. – Adoption et entrée en vigueur d'amendements aux annexes A, B et C. Règlement (CE) n°850/2004, repealed by Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants	
Maldives	No			there are no productions of POPs PDBEs and articles containing POPs PDBEs
Mauritius	No			Inventory of products at national level that may contain brominated diphenyl ethers has not been carried out. However, there are no local manufacturing industries and/or using brominated diphenyl ethers. Moreover, importation of these products/POPs are administratively prohibited under the Dangerous Chemicals Control Act.
Mexico	No			Lack of financial resources. Lack of technical capacity.
Monaco	No			Substances ni produite ni utilisée à Monaco
Montenegro	Yes	The Government of Montenegro updated National implementation plan for Stockholm Convention in july 2019. according to that NIP the measures for Hexabromodiphenyl ether and heptabromodiphenyl ether are defined and will be implemented in the future period.	Not answered	

~~Party~~Respondent	Response	HexaBDE and heptaBDE – actions/control measures and year	TetraBDE and pentaBDE – actions/control measures and year	If No, reasons provided
		Capacity building for the purpose of supplementing inventory of PBDEs; Regular reporting on identified products which contain PBDEs;Raising awareness and familiarising operators/owners (legal persons) with the risks posed by handling products containing PBDEs etc.		
New Zealand	Yes	Hexa/heptaBDEs are listed as a POP under the Hazardous Substances and New Organisms Act 1996 which implements prohibitions on import, manufacture, storage and use of POPs, which includes manufactured articles containing POPs.	Tetra/pentaBDEs are listed as a POP under the Hazardous Substances and New Organisms Act 1996 which implements prohibitions on import, manufacture, storage and use of POPs, which includes manufactured articles containing POPs.	
Norway	Yes	Production, import, export, sale and use of octabromodiphenyl ether (CAS No. 32536-52-0) in pure form, in preparations, in products, and in parts of products containing greater than or equal to 0,1 % of octabromodiphenyl ether by weight was first regulated in Norway in June 2004 by the Regulations relating to restrictions on the manufacture, import, export, sale and use of chemicals and other products hazardous to health and the environment (Product Regulations), Act no. 922 of 1 June 2004. The Product Regulations also specifies that it is prohibited to produce, import, export and make available on the market EEE in which the content of lead, mercury, hexavalent chromium, polybrominated biphenyls (PBBs) or polybrominated diphenyl ethers (PBDEs) in homogeneous materials exceeds 0.1 per cent by weight or of cadmium exceeds 0.01 per cent by weight. Homogeneous material means one material of uniform composition throughout or a material, consisting of a combination of materials that cannot be disjointed or separated into different materials by mechanical actions such as unscrewing, cutting, crushing, grinding and	Production, import, export, sale and use of (CAS No. 32534-81-9) in pure form, in preparations, in products, and in parts of products containing greater than or equal to 0,1 % pentabromodiphenyl ether by weight was first regulated in Norway in June 2004 by the Regulations relating to restrictions on the manufacture, import, export, sale and use of chemicals and other products hazardous to health and the environment (Product Regulations), Act no. 922 of 1 June 2004. The Product Regulations also specifies that it is prohibited to produce, import, export and make available on the market EEE in which the content of lead, mercury, hexavalent chromium, polybrominated biphenyls (PBBs) or polybrominated diphenyl ethers (PBDEs) in homogeneous materials exceeds 0.1 per cent by weight or of cadmium exceeds 0.01 per cent by weight. Homogeneous material means one material of uniform composition throughout or a material, consisting of a combination of materials that cannot be disjointed or separated into different materials by mechanical actions such as unscrewing, cutting, crushing, grinding and abrasive processes. For EEE in following categories the restriction of	

~~Party~~Respondent	Response	HexaBDE and heptaBDE – actions/control measures and year	TetraBDE and pentaBDE – actions/control measures and year	If No, reasons provided
		abrasive processes. For EEE in following categories the restriction of substances shall apply from: a) Category 8 and 9: 22 July 2014 b) Category 8 in vitro diagnostic medical devices: 22 July 2016 c) Category 9 industrial monitoring and control instruments: 22 July 2017 d) EEE that have not previously been regulated and are not covered by a) to c): 22 July 2019 Norwegian authorities carry out controls and inspections in order to ensure compliance with existing legislation.	substances shall apply from: a) Category 8 and 9: 22 July 2014 b) Category 8 in vitro diagnostic medical devices: 22 July 2016 c) Category 9 industrial monitoring and control instruments: 22 July 2017 d) EEE that have not previously been regulated and are not covered by a) to c): 22 July 2019 Norwegian authorities carry out controls and inspections in order to ensure compliance with existing legislation.	
Peru	No			Se encuentra en proceso la actualización del Plan Nacional de Aplicación del Convenio de Estocolmo, donde se contempla el trabajo multisectorial sobre los éteres de difenilo bromado entre otros compuestos orgánicos persistentes. Se tiene programado su aprobación por Decreto Supremo en el primer trimestre del 2020.
Poland	Yes	Poland as a member of European Union has to follow obligation of Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants (OJ L 169 of 25.6.2019. P. 45-77), which stipulates that the manufacturing, placing on the market and use of Pentabromodiphenyl ether, Tetrabromodiphenyl ether, Hexabromodiphenyl ether, Heptabromodiphenyl ether, whether on their own, in mixtures or in articles, shall be prohibited. This provision shall not apply in the case of: (a)a substance used for laboratory-scale research or as a reference standard; (b)a substance present as an unintentional trace	Poland as a member of European Union has to follow obligation of Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants (OJ L 169 of 25.6.2019. P. 45-77), which stipulates that the manufacturing, placing on the market and use of Pentabromodiphenyl ether, Tetrabromodiphenyl ether, Hexabromodiphenyl ether, Heptabromodiphenyl ether, whether on their own, in mixtures or in articles, shall be prohibited. This provision shall not apply in the case of: (a)a substance used for laboratory-scale research or as a reference standard; (b)a substance present as an unintentional trace	

~~Party~~Respondent	Response	HexaBDE and heptaBDE – actions/control measures and year	TetraBDE and pentaBDE – actions/control measures and year	If No, reasons provided
		contaminant, as specified in the relevant entries of Annex I or II, in substances, mixtures or articles. For the purposes of this entry, point (b) shall apply to concentrations of tetrabromodiphenyl ether, pentabromodiphenyl ether, hexabromodiphenyl ether,heptabromodiphenyl ether equal to or below 10 mg/kg (0,001 % by weight) where it is present in substances. 2.For the purposes of the entries on tetra-, penta-, hexa-, hepta- and decaBDE, point (b) shall apply to the sum of the concentration of those substances up to 500 mg/kg where they are present in mixtures or articles, subject to review and assessment by the Commission by 16 July 2021. This review shall assess, inter alia, all relevant impacts with regard to health and the environment. 3.By way of derogation, the manufacturing, placing on the market and use of the following shall be allowed: electrical and electronic equipment within the scope of Directive 2011/65/EC of the European Parliament and of the Council.	contaminant, as specified in the relevant entries of Annex I or II, in substances, mixtures or articles. For the purposes of this entry, point (b) shall apply to concentrations of tetrabromodiphenyl ether, pentabromodiphenyl ether, hexabromodiphenyl ether,heptabromodiphenyl ether equal to or below 10 mg/kg (0,001 % by weight) where it is present in substances. 2.For the purposes of the entries on tetra-, penta-, hexa-, hepta- and decaBDE, point (b) shall apply to the sum of the concentration of those substances up to 500 mg/kg where they are present in mixtures or articles, subject to review and assessment by the Commission by 16 July 2021. This review shall assess, inter alia, all relevant impacts with regard to health and the environment. 3.By way of derogation, the manufacturing, placing on the market and use of the following shall be allowed: electrical and electronic equipment within the scope of Directive 2011/65/EC of the European Parliament and of the Council.	
Portugal	Currently being developed			
Romania	No			Lack of technical capacity.
Russian Federation	Yes	Hygiene Standards: 1. Diagnostic analysis of the state of the environment of the Arctic zone of the Russian Federation (extended summary) / Global Environment Facility, United Nations Environment Program; Repl. ed. B.A. Morgunov. - M.: Scientific World, 2011. 2. Decision of the Council of the Eurasian Economic Commission dated 16.07.2012 No. 54 (as amended on 09/30/2019) “On approval of the	Hygiene Standards: 1. Diagnostic analysis of the state of the environment of the Arctic zone of the Russian Federation (extended summary) / Global Environment Facility, United Nations Environment Program; Repl. ed. B.A. Morgunov. - M.: Scientific World, 2011. 2. Decision of the Council of the Eurasian Economic Commission dated 16.07.2012 No. 54 (as amended on 09/30/2019) “On approval of the	

~~Party~~Respondent	Response	HexaBDE and heptaBDE – actions/control measures and year	TetraBDE and pentaBDE – actions/control measures and year	If No, reasons provided
		unified Commodity Nomenclature for Foreign Economic Activity of the Eurasian Economic Union and the Unified Customs Tariff of the Eurasian Economic Union" (as amended and supplemented. effective from 11/02/2019) 3. The list of pollutants for which measures of state regulation in the field of environmental protection are applied (approved by the order of the Government of the Russian Federation of July 8, 2015 No. 1316-r). 4. Rosstandart. Federal Information Fund for Ensuring the Uniformity of Measurements [Electronic resource]: official. Moscow website, 2019 https://fgis.gost.ru/fundmetrology/registry/19/items/392514 (accessed 11/29/2019) 5. GSO 10141-2012 Approved type standard sample composition of a solution of isotope-labeled polybrominated diphenyl ethers, isotope-labeled tetrachlorodibenzo-p-dioxin (1,2,3,4-TCDD) and nonachlorobiphenyl (PCB-208) in nonane (PBDES- 3). 6. GSO 10142-2012 An approved type standard sample composition of a solution of polybrominated diphenyl ethers and gesabromobiphenyl (GcBB) in nonane (PBDES-4). Data on Environmental Pollution PBDE in the Russian Federation 1. Report "Persistent Organic Pollutants (POPs) in the Baikal Natural Territory". Part II. The results of the expeditionary work of 2015-2016. - Obninsk, 2017. 2. Indicative safe exposure levels (SLE) of pollutants in the atmospheric air of populated areas (Registered in the Ministry of Justice of Russia on January 21, 2008 N 10966) (as amended on October 21, 2016); Research under the project "Monitoring of hazardous substances	unified Commodity Nomenclature for Foreign Economic Activity of the Eurasian Economic Union and the Unified Customs Tariff of the Eurasian Economic Union" (as amended and supplemented. effective from 11/02/2019) 3. The list of pollutants for which measures of state regulation in the field of environmental protection are applied (approved by the order of the Government of the Russian Federation of July 8, 2015 No. 1316-r). 4. Rosstandart. Federal Information Fund for Ensuring the Uniformity of Measurements [Electronic resource]: official. Moscow website, 2019 https://fgis.gost.ru/fundmetrology/registry/19/items/392514 (accessed 11/29/2019) 5. GSO 10140-2012 An approved type standard sample composition of a solution of isotope-labeled pentabromodiphenyl ether (PBDE-126) in nonane (PBDES-2) 6. GSO 10141-2012 Approved type standard sample composition of a solution of isotope-labeled polybrominated diphenyl ethers, isotope-labeled tetrachlorodibenzo-p-dioxin (1,2,3,4-TCDD) and nonachlorobiphenyl (PCB-208) in nonane (PBDES- 3). Data on Environmental Pollution PBDE in the Russian Federation 1. Report "Persistent Organic Pollutants (POPs) in the Baikal Natural Territory". Part II. The results of the expeditionary work of 2015-2016. - Obninsk, 2017. 2. Indicative safe exposure levels (SLE) of pollutants in the atmospheric air of populated areas (Registered in the Ministry of Justice of Russia on January 21, 2008 N 10966) (as amended on October 21, 2016); Research under the project "Monitoring of hazardous substances in the coastal regions of the Pechora Sea: harmonization with the	

~~Party~~Respondent	Response	HexaBDE and heptaBDE – actions/control measures and year	TetraBDE and pentaBDE – actions/control measures and year	If No, reasons provided
		in the coastal regions of the Pechora Sea: harmonization with the Unified Program for the Assessment and Monitoring of OSPAR (JAMP) 2006". 3. Review of the state and environmental pollution in the Russian Federation for 2016. - M., 2017. 4. Overview of the state and environmental pollution in the Russian Federation for 2017. - M., 2018; Studies within the framework of work on the topic of the federal target program "Protection of Lake Baikal and the socio-economic development of the Baikal natural territory for 2012-2020" 5. Order of Rosprirodnadzor of May 22, 2017 No. 242 (as amended on November 2, 2018) "On the Approval of the Federal Classification Catalog of Wastes" (Registered in the Ministry of Justice of Russia on June 8, 2017 No. 47008); Studies within the framework of work on the topic of the federal target program "Protection of Lake Baikal and the socio-economic development of the Baikal natural territory for 2012-2020".	Unified Program for the Assessment and Monitoring of OSPAR (JAMP) 2006". 3. Review of the state and environmental pollution in the Russian Federation for 2016. - M., 2017. 4. Overview of the state and environmental pollution in the Russian Federation for 2017. - M., 2018; Studies within the framework of work on the topic of the federal target program "Protection of Lake Baikal and the socio-economic development of the Baikal natural territory for 2012-2020" 5. Order of Rosprirodnadzor of May 22, 2017 No. 242 (as amended on November 2, 2018) "On the Approval of the Federal Classification Catalog of Wastes" (Registered in the Ministry of Justice of Russia on June 8, 2017 No. 47008); Studies within the framework of work on the topic of the federal target program "Protection of Lake Baikal and the socio-economic development of the Baikal natural territory for 2012-2020".	
Sao Tome and Principe	No			Lack of financial resources. Lack of technical capacity.
Serbia	Yes	According to the provisions of the Law on Chemicals which are harmonized with POPs Regulation EU No. 850/2004, in the Republic of Serbia: 1.Production, placing on the market and use shall be allowed for substances, mixtures, articles or as constituents of flame-retarded parts of articles when concentrations of hexaabromodiphenyl ether is equal to or below 10 mg/kg (0,001 % by weight) 2. Production, placing on the market and use shall be allowed for articles and mixtures ~~-~~containing concentrations below 0,1% of hexabromodiphenyl ether by weight when produced partially or fully	According to the provisions of the Law on Chemicals which are harmonized with POPs Regulation EU No. 850/2004, in the Republic of Serbia: 1.Production, placing on the market and use shall be allowed for substances, mixtures, articles or as constituents of flame-retarded parts of articles when concentrations of tetrabromodiphenyl ether is equal to or below 10 mg/kg (0,001 % by weight) 2. Production, placing on the market and use shall be allowed for articles and mixtures ~~-~~containing concentrations below 0,1% of tetrabromodiphenyl ether by weight when produced partially or fully from recycled materials or materials from waste	

~~Party~~Respondent	Response	HexaBDE and heptaBDE – actions/control measures and year	TetraBDE and pentaBDE – actions/control measures and year	If No, reasons provided
		from recycled materials or materials from waste prepared for re – use	prepared for re – use	
Spain	Not answered			
Sri Lanka	Yes	Control of importation of post-consumer waste according to national waste management policy (Used electronic equipment - specially computers) It is scheduled to introduce EPR to assure environmentally friendly management of WEEE.	Control of importation of post-consumer waste according to national waste management policy (Used mattresses, Vehicle cushion and other PUR applications).	
Suriname	Currently being developed			
Switzerland	Yes	According to Annex 1.1 Number 1 Paragraph 2 of the Ordinance on the Reduction of Risks relating to the Use of Certain Particularly Dangerous Substances, Preparations and Articles (ORRChem, SR 814.81) new articles may not be placed on the market if they or their components contain hexabromodiphenyl ethers or heptabromodiphenyl ethers as listed under Number 3, which are not merely unavoidable impurities. For electrical and electronic equipment that contains brominated diphenyl ethers, Annex 2.18 of the ORRChem applies. According to Annex 2.18 Number 2 Paragraph 1 it is prohibited to place on the market electrical and electronic equipment, cables or spare parts if the concentration by mass of brominate diphenyl ethers, including hexabromodiphenyl ethers and heptabromodiphenyl ethers, exceeds a maximum concentration of 0.1 percent by mass in the homogeneous material.	According to Annex 1.1 Number 1 Paragraph 2 of the Ordinance on the Reduction of Risks relating to the Use of Certain Particularly Dangerous Substances, Preparations and Articles (ORRChem, SR 814.81) new articles may not be placed on the market if they or their components contain tetrabromodiphenyl ethers or pentabromodiphenyl ethers as listed under Number 3, which are not merely unavoidable impurities. For electrical and electronic equipment that contains brominated diphenyl ethers, Annex 2.18 of the ORRChem applies. According to Annex 2.18 Number 2 Paragraph 1 it is prohibited to place on the market electrical and electronic equipment, cables or spare parts if the concentration by mass of brominate diphenyl ethers, including tetrabromodiphenyl ethers and pentabromodiphenyl ethers, exceeds a maximum concentration of 0.1 percent by mass in the homogeneous material.	
Thailand	Currently being developed			
Turkey	Yes	By-law on POPs (dated 14 Nov 2018) covers obligations related to environmentally sound	By-law on POPs (dated 14 Nov 2018) covers obligations related to environmentally sound	

~~Party~~Respondent	Response	HexaBDE and heptaBDE – actions/control measures and year	TetraBDE and pentaBDE – actions/control measures and year	If No, reasons provided
		management of wastes containing BDEs. Management of BDE containing articles except ones exempted in Annex 2 of POPs By-law, has been regulated in Annex 4 and Annex 5 of the same By-law. In addition, by-law on WEEE (dated 22 May 2012) is also covering management of articles i.e. electirical and electronic equipment.	management of wastes containing BDEs. Management of BDE containing articles except ones exempted in Annex 2 of POPs By-law, has been regulated in Annex 4 and Annex 5 of the same By-law. In addition, by-law on WEEE (dated 22 May 2012) is also covering management of articles i.e. electirical and electronic equipment.	
United Kingdom	Yes	In the UK, the manufacturing, placing on the market and use of PBDEs has been prohibited since 2004. Controls on waste articles and stockpiles containing PBDEs have been in place since 2009 and are set out in Regulation (EU) 2019/1021 on POPs. These Regulations require that waste articles containing PBDEs above the permitted concentration limits must be separated and the POP content be destroyed or irreversibly transformed.	In the UK, the manufacturing, placing on the market and use of PBDEs has been prohibited since 2004. Controls on waste articles and stockpiles containing PBDEs have been in place since 2009 and are set out in Regulation (EU) 2019/1021 on POPs. These Regulations require that waste articles containing PBDEs above the permitted concentration limits must be separated and the POP content be destroyed or irreversibly transformed.	
United States	Not answered			
Zimbabwe	Currently being developed			

Question 3: Has your country identified articles in use that contain or may contain brominated diphenyl ethers?

~~Party~~Respondent	Response	If Yes - Information and quantities available on such articles	If No, reasons provided
Australia	Yes	Information on the presence and levels of polybrominated diphenyl ethers in articles in Australia comes principally from a study published in 2014.* This study examined the identity and levels of polybrominated diphenyl ethers in a range of articles or article components that were available for sale in Australia in 2012. These articles included computers, televisions, power adaptors, CD players, plastic toys, deep fryers, clothes dryers and fans. Destructive testing revealed that: Approximately 30% of the articles contained octaBDE, the identified levels all being less than 1%. The levels of octaBDE detected in articles in the Australian study were below those typically used to comply with flammability requirements, suggesting that c-octaBDE may have unintentionally been introduced into these articles through the recycling. Recently the National Industrial Chemicals Notification and Assessment Scheme (NICNAS), the Australian regulator of industrial chemicals, has conducted a call for information on presence and uses of pentaBDE in Australia. This call has included a desire for manufacturers and importers to provide information on the uses and quantities of pentaBDE which have been, or will likely be, included in articles between July 2017 and June 2019. The results from this call will be part of the Priority Existing Chemical report that NICNAS is preparing with respect to the human health and environmental risks of pentaBDE. *(Gallen C, Banks A, Brandsma S, Baduel C, Thai P, Eaglesham G, Heffernan A, Leonards P, Bainton P, Mueller JF. 2014. Towards development of a rapid and effective non-destructive testing strategy to identify brominated flame retardants in the plastics of consumer products. Sci Total Environ. 491-492, 255-265)	
Austria	Yes	Not answered	
Bosnia and Herzegovina	Yes	Based on UNEP Guidelines and using data obtained, the PBDEs Inventory Group calculated PBDEs in EEE and transport sector. The greatest amount of PBDEs in electronic and electrical equipment- was found in the equipment of users, while the maximum amount of PBDE s in the transport sector were found in the vehicles imported in 2012. Homologues HexaBDE (PBDEs in imported EEE 2012 (42 kg), PBDEs in stocks 2013 - kg 2,324) PBDEs that enter the waste chain 2013 (kg) (424 kg) Hepta BDE (Hepta BDE in imported EEE 2012 (kg)PBDEs in imported EEE 2012 (163 kg), PBDEs in stocks 2013 - kg 9,086) PBDEs that enter the waste chain 2013 (kg) (1,657 kg) TetraBDE(PBDEs in currently used vehicles in 2013 - 137 kg, PBDEs in	

~~Party~~Respondent	Response	If Yes - Information and quantities available on such articles	If No, reasons provided
		imported vehicles 2012 - 301 699 kg, PBDEs in end of-life vehicles (76 KG), PentaBDE(PBDEs currently used vehicles in 2013 - 2,412 kg, PBDEs in imported vehicles 2012 - 530 260 kg, PBDEs in end of-life vehicles (134 kg), HexaBDE (PBDEs in currently used vehicles in 2013 - 33 kg, PBDEs in imported vehicles 2012 - 73 139 kg, PBDEs in end of-life vehicles (19 kg), HeptaBDE (PBDEs in currently used vehicles in 2013 - 2 kg, PBDEs in imported vehicles 2012 - 4,571 kg, PBDEs in end of-life vehicles (1kg)	
Bulgaria	Yes	EEE and motor vehicles	
Cameroon	Yes	Le Cameroun ne produit pas d'équipements susceptibles de générer les POP PBDE, le HBB et l'HBCD mais il utilise les produits et articles contenant ces POP. Comme ils ne sont plus utilisés dans les pays producteurs d'articles industriels et ménagers, le plus gros gisement de ces POP se trouve dans les équipements électriques et électroniques (EEE) anciens détenus par les ménages et dans les stocks des déchets générés par ces équipements. Dans l'ensemble, le Cameroun détiendrait, à travers diverses sources en 2014 : - 17585 kg de c-OctaBDE, dont les deux principales sources sont les équipements électriques et électroniques détenus par les ménages et le flux des déchets des équipements électriques et électroniques, dont : o 2283,55 kg d'HexaBDE, dont les principales sources sont les stocks des équipements électriques et électroniques détenus par les ménages, les D3E et les véhicules en circulation ou en fin de vie. o 7583,32 kg d'HeptaBDE, dont les principales sources sont les stocks d'EEE détenus par les ménages et les flux des D3E. - 2531,36 kg de PentaBDE provenant exclusivement des véhicules en circulation ou en fin de vie. - 1440,25 kg de TetraBDE provenant exclusivement des véhicules en fin de vie ou en circulation. Il n'y a pas d'informations précises sur les autres POP retardateurs de flammes.	
Canada	Yes	Tetrabromodiphenyl ether and pentabromodiphenyl ether: Textile and foam-based products such as mattresses, furniture and carpet backing. Hexabromodiphenyl ether and heptabromodiphenyl ether: Products containing acrylonitrile butadiene styrene (ABS) plastics such as electronic equipment	
Chile	Information not available		
Côte d'Ivoire	Not answered		

~~Party~~Respondent	Response	If Yes - Information and quantities available on such articles	If No, reasons provided
Estonia	Yes	During the renewal of NIP questionnaires were used to gather information about the articles in use. No specific information was presented. The information we have is based on general knowledge about the articles which are assumed to contain brominated diphenyl ethers.	
Germany	Yes	will be filled in later	
Guyana	No		Lack of legal, institutional or policy framework. Lack of financial resources. Lack of technical capacity.
Hungary	Information not available		
Kyrgyzstan	No		Lack of legal, institutional or policy framework. Lack of financial resources. Lack of human resources. Lack of technical capacity.
Lebanon	Not answered		
Luxembourg	Yes	The substances might be contained in these articles: Electrical and electronic equipment automotive industry upholstered furniture industry polystyrol insulation	
Maldives	Yes	Electric and Electronic Equipment (EEE) and in transport vehicles, the POPs PBDE containing wastes from 1970 until now have been left at landfills and dumpsites. Therefore, it is expected that waste dumpsites may have POPs PBDEs (MALDIVES NIP 2017)	
Mauritius	No		Lack of technical capacity. Inventory of articles containing brominated diphenyl ethers has not yet been undertaken but same will be undertaken in the review of the National Implementation Plan.
Mexico	Yes	El Penta BDE y el Octa BDE de calidad comercial se dejaron de producir entre 2004 y 2005, por lo cual el foco de atención del PNI se centra en el manejo de los productos que aún los contienen, los cuales al desecharse se convertirán en residuos que demandarán un manejo que dé cumplimiento a lo dispuesto en el Convenio y en la legislación nacional. El Penta BDE-c utilizado como retardante de flama entre 1970 y 2004, se	

~~Party~~Respondent	Response	If Yes - Information and quantities available on such articles	If No, reasons provided
		encuentra en productos que están aún en uso o en importantes volúmenes de residuos de productos que han llegado al fin de su vida útil como alfombras, vestiduras en muebles, colchones y espumas de poliestireno; así como asientos y vestiduras de vehículos producidos en Norteamérica. Conforme a las estimaciones realizadas, hasta 2004, se vendieron en México 23,200,595 unidades que incluyen automóviles y vehículos de pasajeros y carga, de los cuales el 60% siguen en circulación esperando llegar al final de su vida útil en el 2021. Lo anterior, significa que es necesario disponer adecuadamente de 1,950 toneladas de PentaBDE-c prsentes en vestiduras de vehículos. Respecto a los otros residuos y productos que contienen PentaBDE-c, debido a la mínima disponibilidad de infromación recabada para el diagnóstico inicial sobre los nuevos COP de uso industrial para actualizar el PNI, se considera que es necesario llevar a acabo un inventario a mayor profundidad que incluya una estimación más detallada sobre los volúmenes generados de residuos que contengan retardantes de flama. Entre 1970 y 2004, una proporción importante de la producción global de OctaBDE-c se utilizó como retardante de flama en carcasas plásticas y otras partes de aparatos electrónicos, entre los que sobresalen, las computadoras, sus monitores y los televisores con cinescopio (tubo de rayo catódico). El total de plástico contaminado con OctaBDE-c en los aparatos antes mencionados, corresponde a 242,415 toneladas con contenidos de este compuesto en las siguientes proporciones: para computadoras 0.15 kg/ton; para monitores de computadora 2.54 kg/ton y para las TV 0.87 kg/ton. Lo cual resulta en 239.5 toneladas de OctaBDE-c contenido en los residuos plásticos de estos tres tipos de aparatos. Si se considera que la vida útil para computadoras es de 5 años, la mayor parte de equipos ya debió haber sido reciclado o desechado, salvo los que aún se encuentren almacenados en oficinas o en casas. Respecto a los televisores en México, su vida puede ser entre 10 y 18 años, y su tiempo de almacenaje al fin de su vida útil puede ir más allá de los 2 años. De acuerdo a lo anterior, se estima entre un 40-50% de los aparatos inventariados está aún en posesión de sus propietarios mientras que el otro 50-60% entró ya a la corriente de reciclaje.	
Monaco	No		Substance ni produite ni utilisée à Monaco
Montenegro	Yes	in updated NIP two key sectors using POP-PBDE were identified and can be considered relevant: a) Electrical and Electronic Equipment (EEE) and Waste Electrical and Electronic Equipment (WEEE) sector b) transport sector and appropriate waste.	

~~Party~~Respondent	Response	If Yes - Information and quantities available on such articles	If No, reasons provided
		Considering the c-penta BDE content propotion, the dominant c-penta BDE content is certainly found in cars (90.94%), followed by trucks (5.36%) and buses (3.69%. In NIP are given all details regarding the assessment of the total polymer fraction in the relevant EEE, Data for the preliminary inventory of POP PBDE in the EEE in Montenegro, Distribution of HexaBDE, heptaBDE and OctaBDE homologues in EEE and in WEEE. The quantities of bromine contained in those articles are not defined.	
New Zealand	Yes	Only identified generically, as indicated in Articles in Use notifications.	
Norway	No		See response to question 2. In Norway production, import, export, sale and use of POP-BDEs in their pure form, in preparations, in products, and in parts of Products has been regulated since 2004 and in electronical and electrical equipment since 2008. Regular control and inspection activities of contents in products are undertaken. Waste containing penta- and octaBDE at concentrations above 0.25 % has been considered hazardous waste. According to the existing regulation materials with a BDE content above 1000 mg/kg (sum of combined tetra, penta, hexa and hepta PBDE) cannot be used in new products. In general, waste fractions that might contain PBDEs are not recycled but irreversibly destruced by incineration.
Peru	Yes	Producción de: - Plásticos - Material de resina y plásticos en aparatos eléctricos y electrónicos - Tapicería, en espuma de poliuretano, cojines, colchones - Vehículos, aplicaciones como asiento, posa brazos o respaldos para la cabeza, techos de automóviles.	
Poland	Information not available		
Portugal	Information not available		
Romania	Information not available		

~~Party~~Respondent	Response	If Yes - Information and quantities available on such articles	If No, reasons provided
Russian Federation	Yes	Brominated Diphenyl Ethers were not produced in Russia, but were imported in the form of flame-retardants in industrial products. From 2000 to 2004, according to the Federal Customs Service of the Russian Federation, 21.3 tons of BDE were imported (GN 2.2.5.3532-18 Maximum allowable concentrations (MAC) of harmful substances in the air of the working area (Registered in the Ministry of Justice of Russia on April 20, 2018. N 50845). Custom Codes: 2909 30 100 0 - pentabromodiphenyl ether simple 3824 88 000 0 - products containing tetra-, penta-, hexa-, hepta- or octabrodiphenyl ethers (Khoroshko L.O., Nikiforov V.A., Zhakovskaya Z.A., Mamontova V.N., Kukhareva G.I. Polybrominated diphenyl ethers (PBDE) in water and in bottom sediments of the Gulf of Finland and p. Neva // Regional Ecology. - 2014. - No. 1-2. - S. 84-87.)	
Sao Tome and Principe	No		Lack of legal, institutional or policy framework. Lack of technical capacity.
Serbia	No		Lack of financial resources.
Spain	Not answered		
Sri Lanka	Yes	According to the 'Preliminary Inventory of Polybrominated Diphenyl Ethers (PBDEs) and Hexabromo Biphenyl (HBB) in Sri Lanka - 2015 under NIP, 1) PBDEs in EEE stocks for inventory year 2014: 4415.36 kg (c-octaBDE) PBDEs entering the waste stream for inventory year 2014: 551.92 kg 2)HeptaBDEs in EEE stocks for inventory year 2014: 1898.6 kg HeptaBDEs entering the waste stream for inventory year 2014: 237.33 kg 3) Total PBDE in PUR foam of vehicles in current use or sale (year 2015) - 5444.59kg (TetraBDE -1796.71Kg, PentaBDE - 3157.86Kg, HexaBDE - 435.57Kg, HeptaBDE - 27.22Kg)	
Suriname	Yes	Assessed in 2016: The total plastic imported in television and computers with cathode ray tubes (CRTs) is estimated to be 969 tonnes between 2001 and 2016, containing 1025 kg c-OctaBDE. Since CRTs are imported since the 60's. these amounts should be 3 to 6 times higher. The estimated total amount of plastic of CRTs in use or stocked is estimated to be 88 tonnes, containing 129 kg c-OctaBDE (including 70 kg POP-PBDEs) Based on the assumption already a large amount 896 kg-C-OctaBDE already ended up on the landfill and based on the imports since the 60's, this amount	

~~Party~~Respondent	Response	If Yes - Information and quantities available on such articles	If No, reasons provided
		should be 3-6 times higher. C-PentaBDE in cars and buses are estimated around around 1688 kg	
Switzerland	No		The placing on the market of new articles, that contain brominated diphenyl ethers is not allowed according to the legal provisions described above in the response to question 2.1. Articles that contain brominated diphenyl ethers, which have been placed on the market before the ban of brominated diphenyl ethers entered into force, are mostly not in use any more and disposed of.
Thailand	Yes	Thailand conducted field surveys on electrical and electronic equipment (EEE), automotive, textiles, household items and plastic chips using EDXRF, FTIR with in-house developed analytics method based on Machine Learning (ML) classification technique for flame retardant classification, and GC-MS. The surveys did not find penta- or octa-BDE in in-uses items but found trace of octa-BDE in old stock of ABS shredded chips. An in-depth investigation indicated the historic use of octa-BDE in plastic housings of high-end computer CRT monitors produced before 1995 and an imported CRT TV. These CRT monitors were imported from Asian countries. The level of octa-BDE in the affected products as quantified by EDXRF was about 15% (corrected for octa-BDE concentration) while the concentration of octa-BDE in the affected ABS batches was estimated at about 0.5-1%. A prediction based on a products life-time model indicated less than 10,000 sets of affected PC CRT monitors were still in hibernation. Evidences from octa-BDE contaminated ABS chips (old batch) suggested there might be other minor uses of octa-BDE. Physical apparent of these chips suggested that the suspected products were produced with old injection technology. The true nature of these minor uses was still unclear and under on-going investigation.	
Turkey	No		Lack of financial resources. Lack of technical capacity. Lack of market surveillance.
United Kingdom	Yes	In the UK a project has recently been completed to assess levels of brominated flame retardants (BFRs) in waste electrical and electronic equipment (WEEE). The project used X-ray fluorescence (XRF) to chemically analyse over 2,000 articles of WEEE, in particular recording the levels of bromine present. A sub-sample of over 2000 articles were subsequently sent for analysis via gas chromatography-mass spectrometry (GC-MS) to identify the precise brominated compounds present, with a particular emphasis on PBDEs. The study concluded that various WEEE streams are likely to be contaminated	

~~Party~~Respondent	Response	If Yes - Information and quantities available on such articles	If No, reasons provided
		with PBDEs at levels higher than those permitted in Regulation (EU) 2019/1021 on POPs. These include waste articles which had previously been considered to be POPs free and may have been recycled. Similar articles which are expected to still be in use and will need to be dealt with at end of life. The final project report is due for publication by March 2020 and we will share this with the Convention Secretariat for wider distribution to any interested Parties.	
United States	Not answered		
Zimbabwe	Information not available		

Question 4: Has your country taken measures to dispose of articles that contain or may contain brominated diphenyl ethers in an environmentally sound manner, in accordance with paragraph 1 (d) (ii) of Article 6 of the Convention?

~~Party~~Respondent	Response	If Yes - Information and quantities available on such articles	If No, reasons provided
Australia	Yes	Articles not recycled are sent for disposal in landfill.	
Austria	Yes	Not answered	
Bosnia and Herzegovina	No		Lack of financial resources. Lack of technical capacity.
Bulgaria	No		We are not taking measures on disposal but we are taking measures only on recovery.
Cameroon	Yes	Il est mis en place au niveau du Cameroun un centre de démantèlement et de stockage des différents compartiments des équipements électriques et électroniques tels que les polybromoéther et les autres retardataires de flamme en vue de leur élimination ultérieure	
Canada	Yes	Canada takes appropriate measures to dispose of articles that contain or may contain PBDEs in an environmentally sound manner.	
Chile	No		Lack of financial resources. Lack of technical capacity. No existe normativa ni políticas específicas de eliminación.
Côte d'Ivoire	Not answered		
Estonia	Yes	Disposal is only allowed based on environmental permits and the use of Best Available Technique. There is regulation in place for persistent organic pollutants, which lays down requirements for suitable waste operations to ensure that the persistent organic pollutant content is destroyed or irreversibly transformed. The information about total amount of bromine, which has been disposed of, is not available.	
Germany	Yes	will be filled in later	
Guyana	No		Lack of financial resources. Lack of technical capacity.
Hungary	No		Lack of financial resources. Lack of technical capacity.
Kyrgyzstan	No		Lack of financial resources. Lack of technical capacity.

~~Party~~Respondent	Response	If Yes - Information and quantities available on such articles	If No, reasons provided
Lebanon	Not answered		
Luxembourg	Yes	incineration in authorized incinerators	
Maldives	No		Lack of technical capacity.
Mauritius	No		Inventory of articles containing brominated diphenyl ethers has not yet been undertaken. However, it is to be noted in Mauritius we have an interim storage facility for hazardous wastes. It came in operation in April 2017 and provides for the interim storage of hazardous chemical wastes, which are subsequently exported to licensed facilities abroad for final disposal.
Mexico	No		Lack of financial resources Lack of technical capacity
Monaco	No		Substance ni produite ni utilisée à Monaco
Montenegro	Yes	in NIP are defined proper management of waste containing PBDEs, HBB and HBCDD, in accordance with guidelines set out by the Basel Convention, also treatment of waste containing PFOS and remediation of identified sites contaminated with POPs.	
New Zealand	Yes	Only identified generically, as indicated in Articles in Use notifications.	
Norway	Yes	Such articles must be destroyed and treated as waste by incineration such that the POPs content is destroyed or irreversibly transformed.	
Peru	No		Se encuentra en proceso la actualización del Plan Nacional de Aplicación del Convenio de Estocolmo, donde se contempla el trabajo multisectorial sobre los éteres de difenilo bromado entre otros compuestos orgánicos persistentes. Se tiene programado su aprobación por Decreto Supremo en el primer trimestre del 2020.
Poland	Yes	According to art. 7 of Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants, waste with the concentration limits exceeding 1000 mg/kg (sum of the concentrations of tetrabromodiphenyl ether, pentabromodiphenyl ether, hexabromodiphenyl ether, heptabromodiphenyl ether and decabromodiphenyl ether) subject to waste management provisions set out in Article 7 and shall be disposed of or recovered, without undue delay, in such a way as to ensure that the POP content is destroyed or irreversibly transformed so that the remaining waste and releases do not exhibit the characteristics of POPs. The Commission shall review that concentration limit and shall, where	

~~Party~~Respondent	Response	If Yes - Information and quantities available on such articles	If No, reasons provided
		appropriate and in accordance with the Treaties, adopt a legislative proposal to lower that value to 500 mg/kg. The Commission shall carry out such review as soon as possible and, in any event, not later than 16 July 2021.	
Portugal	No		Not answered
Romania	Yes	not available	
Russian Federation	Yes	GOST R 56828.41-2018 The best available technology. Neutralization of industrial wastes containing halogenated organic substances, including persistent organic pollutants. Indicators for identification. This standard establishes the minimum requirements for the range of indicators characterizing the best available technologies (BAT) for the neutralization of waste products containing halogenated organic substances including persistent organic compounds. The standard applies to the types of waste included in the group with code 4 72 000 00 00 0 Waste of equipment and other products containing halogenated aromatic organic substances, including persistent organic pollutants of the Federal Classification Catalog of Wastes [Report “Persistent Organic Pollutants (POPs) on Baikalskaya natural territory. " - Obninsk, 2015.: [Electronic resource]. - Access mode https://www.rpatyphoon.ru/activities/ecomonitoring/ecomonitor-baikal.php (accessed 12.24.2019)].	
Sao Tome and Principe	No		Lack of financial resources. Lack of technical capacity.
Serbia	Yes	According to the provisions of the Law on Waste Management, PBDEs waste or waste contains PBDEs (above 1000 ppm) shall be treated as hazardous waste and dispose in environmentally sound manner	
Spain	Not answered		
Sri Lanka	No		Lack of financial resources. Lack of technical capacity. There is no proper mechanism to dispose articles that contain brominated diphenyl ethers in an environmentally sound manner. For example, End of Life Vehicles (ELV) are auctioned and then some parts of the vehicles are recycled as iron, some parts are undergo in tinkering process, etc. but there is no any solution for parts like dash boards and steering wheels.
Suriname	No		Lack of financial resources.

~~Party~~Respondent	Response	If Yes - Information and quantities available on such articles	If No, reasons provided
			Lack of technical capacity.
Switzerland	Yes	Articles that contain or may contain brominated diphenyl ethers when becoming waste at the end of their life must be disposed of in an environmentally sound manner which means that the brominated diphenyl ethers are destroyed. This is mostly a thermal decomposition in waste incineration plants equipped with state-of-the-art flue-gas cleaning systems.	
Thailand	No		Currently being developed
Turkey	Yes	Currently, POPs By-law, By-law on Waste Management and By-law on WEEE covers disposal of articles containing BDEs. Howeever, there is lack of a proper enforcement mechanism that separates articles that contain BDE or not.	
United Kingdom	Yes	As explained in section two, when articles containing POPs become waste in the UK the holder is obligated to ensure that the POP content is removed and destroyed or irreversibly transformed. Different techniques are used to identify and separate waste articles containing PBDEs in the UK. These include, but are not limited to, visual, intelligence-based identification and manual separation; and separation via sink-float density technology. Generally, articles contaminated with PBDEs are disposed of via Solid Waste Incineration in the UK.	
United States	Not answered		
Zimbabwe	No		Lack of technical capacity.

Question 5: Has your country recycled articles that contain or may contain brominated diphenyl ethers?

~~Party~~Respondent	Response	If Yes, information on any actions or control measures to ensure that recycling is carried out in an environmentally sound manner.	If Yes - information available on articles that have been recycled.	If No, reasons provided
Australia	Yes	Not answered	Not answered	
Austria	Yes	Not answered	Not answered	
Bosnia and Herzegovina	Yes	PBDEs are not produced in BiH, they are used in products that are manufactured in or imported to BiH, Approximately 92 592 tons of e-waste is generated each year, i.e about 24,4 tons per capita, There are no records of the second-hand eqipment containg EEE imported and exported from BiH, nor of the the status of such equipment, It is unclear what proportion of the second-hand equipment containing EEE is functional within a reasonable time after its sale, There are no records of vehicles that reach their end-of-life (ELV), nor are they disposed of in an environmentally sound manner	Not answered	
Bulgaria	Yes	We provide activities R12 and R13 in accordance with Annex II of Directive 2008/98/EC on waste.	Not answered	
Cameroon	Yes	décret n° 2012/2809 du 26 septembre 2012 fixant les conditions de tri, de collecte, de stockage, de transport, de récupération, de recyclage, de traitement et d'élimination finale des déchets Arrêté conjoint n°005/Minepded/ Mincommerce du 24 octobre 2012 Fixant les conditions spécifiques de gestion des équipements électriques et électroniques ainsi que de l'élimination des déchets issus de ces équipements Arrêté 004/MINEPDED/CAB du 21 Sept 2017 modifiant et complétant la liste des substances chimiques du décret 2011/2581/PM du 23 Août 2011 portant règlementation des substances chimiques, nocives et/ou dangereuses	Des D3E de tous types ont été recyclés mais majoritairement issus des appareils informatiques, pour un total cumulé de 141,4 tonnes dont 27,5 tonnes en 2019	
Canada	Information not available			
Chile	Information not available			

~~Party~~Respondent	Response	If Yes, information on any actions or control measures to ensure that recycling is carried out in an environmentally sound manner.	If Yes - information available on articles that have been recycled.	If No, reasons provided
Côte d'Ivoire	Not answered			
Estonia	Yes	All the recycling activities are regulated with environmental permits. The applicants have to describe their processes on how they meet requirements for environmentally sound waste treatment. There is also enforcement in place to check that waste is sorted and recycled in the required way. This also includes the handling of waste consisting of POPs.	Some waste stream of electric and electronic equipment has been recycled, but most of it has been disposed of to destroy the content of POPs or exported to other EU countries where the information about the further treatment is not available at the moment.	
Germany	Yes	will be filled in later	will be filled in later	
Guyana	Information not available			
Hungary	Information not available			
Kyrgyzstan	No			Lack of legal, institutional or policy framework. Lack of financial resources. Lack of human resources. Lack of technical capacity.
Lebanon	Not answered			
Luxembourg	No			Lack of technical capacity.
Maldives	No			Not answered
Mauritius	No			Lack of technical capacity. Inventory of articles containing brominated diphenyl ethers has not yet been undertaken.
Mexico	Information not available			
Monaco	No			Substance ni produite ni utilisée à Monaco

~~Party~~Respondent	Response	If Yes, information on any actions or control measures to ensure that recycling is carried out in an environmentally sound manner.	If Yes - information available on articles that have been recycled.	If No, reasons provided
Montenegro	Yes	Not answered	Regarding the recycling of end-of-life vehicles, Montenegro operates three plants for the dismantling of vehicles out of use and preparation for the reuse and/or recycling of their parts. One is located within the Regional Recycling Centre at the "Livade" Landfill in Podgorica, the second one within the company "Bukumirska Jezera" in Podgorica and the third one within the company "Recycling Centre" d.o.o. from Niksic. In response to the inquiry on processed cars, Deponija d.o.o answered that in the period from 2013 to 2016, 512 end-of-life vehicles were handled in their plant (Table) Table - The number of processed vehicles in the dismantling plant Deponija d.o.o. Year Number of handled vehicles 2013 105 2014 252 2015 119 2016 36 During 2015, 2016 and 2017, Recycling Centre d.o.o. of Niksic processed 100 vehicles while "Bukumirska Jezera" of Podgorica handled more than 120 end-of-life vehicles in 2016. From the above data it can be concluded that a large number of end-of-life vehicles still end up in places that are not intended for disposal. The National Waste Management Plan for Montenegro for the period 2015-2020 mentions unregulated landfills by municipalities where, among other things, decommissioned and end-of-life vehicles	

~~Party~~Respondent	Response	If Yes, information on any actions or control measures to ensure that recycling is carried out in an environmentally sound manner.	If Yes - information available on articles that have been recycled.	If No, reasons provided
			are found. As known, the "Guidance for the inventory of polybrominated diphenyl ethers (PBDEs) listed under the Stockholm Convention on Persistent Organic Pollutants" suggests the possibility of comparwith the experiences of others (especially by economic development, policies, etc.) from related countries, and in that sense the experiences of regional countryes are used here.The number of end-of-life vehicles on landfills in Montenegro has been calculated by multiplying the number of registered vehicles with a certain factor (for cars by 0.23, for buses by 0.46, for trucks by 1.89) and multiplying by 0.15. The results of the calculation are given in Table 40 in NIP.	
New Zealand	No			Have not registered for the recycling exemption, no national capability for recycling this material.
Norway	No			Waste containing POP-BDEs may not be recycled in accordance with Norwegian waste regulations. Inspection and control activities are in place, but has not identified any articles containing POP-BDEs. However, illegal activities/ irregularities may still occur.
Peru	Information not available			
Poland	No			Not answered

~~Party~~Respondent	Response	If Yes, information on any actions or control measures to ensure that recycling is carried out in an environmentally sound manner.	If Yes - information available on articles that have been recycled.	If No, reasons provided
Portugal	Not answered			
Romania	Information not available			
Russian Federation	Information not available			
Sao Tome and Principe	Information not available			
Serbia	Yes	Ministry of Environmental Protection was prepared the Guidance for identification and separation of PBDEs from waste for recycling industry using handle separation combined with XRF Screening according to the SC Guidelines recommendations.	NA	
Spain	Not answered			
Sri Lanka	Information not available			
Suriname	Yes	Before recycling cars, everything is taken away, car seat etc. These are dumped or burned at the landfill (Not in an environmentally sound manner)	Cars, Iron from cars.	
Switzerland	No			See response to the previous question 4.1.
Thailand	Yes	Not answered	Please see detail in question 3	
Turkey	Information not available			
United Kingdom	Yes	As discussed in section 3, in the UK a project has recently been completed to assess levels of brominated flame retardants (BFRs) in waste electrical and electronic equipment (WEEE). The project used X-ray fluorescence (XRF) to chemically analyse over 2,000 articles of WEEE, in particular recording the levels of bromine present. A sub-sample of over 2000 articles were subsequently sent for analysis via gas chromatography-mass spectrometry (GC-MS) to identify the precise brominated compounds present, with a particular emphasis on PBDEs.	A final report for the UK WEEE sampling study is due for publication by March 2020. This will include information on the type of individual articles sampled which may have previously been recycled in the UK. The final published report will be shared with the Convention Secretariat.	

~~Party~~Respondent	Response	If Yes, information on any actions or control measures to ensure that recycling is carried out in an environmentally sound manner.	If Yes - information available on articles that have been recycled.	If No, reasons provided
		The study concluded that various WEEE streams are likely to be contaminated with PBDEs at levels higher than those permitted in Regulation (EU) 2019/1021 on POPs. UK regulators have responded to the findings of the project by reminding industry that the affected articles should not be recycled unless the POP content is separated and destroyed or irreversibly transformed. UK Regulators continue to work closely with industry on this issue via purposely established working groups.		
United States	Not answered			
Zimbabwe	No			Lack of financial resources. Lack of technical capacity.

Question 6: Has your country been able to put in place measures to separate articles containing brominated diphenyl ethers before recycling?

~~Party~~Respondent	Response	HexaBDE and heptaBDE – measures in place	TetraBDE and pentaBDE– measures in place	If No, reasons provided
Australia	No			Lack of technical capacity.
Austria	Yes	Not answered	Not answered	
Bosnia and Herzegovina	Currently being developed			
Bulgaria	Currently being developed			
Cameroon	Yes	Après l'obtention des plastiques issus du processus de démantèlement des D3E, nous opérons un premier tri pour séparer les plastiques noir des plastiques blancs, ensuite un second tri plus précis pour identifier et séparer les polymères contenant des additifs halogénés, notamment les retardateurs de flamme bromés. Ces plastiques sont par la suite fractionnés en morceaux et conditionnés dans des sacs de 100 kilos. Par ailleurs, une étude a été faite sur la teneur en brome de plusieurs de nos échantillons de plastique. En voici les principales conclusions : • Sur une masse totale d'échantillons de 42,85 kg, la masse de brome correspond à 0,67 kg. Cela veut dire que sur TOUS NOS PLASTIQUES TESTES il y a 1,6% en masse de brome (= 16 000 ppm). Donc nous sommes au dessus (en masse moyennée) de la limite à 2000 ppm. • Selon le Comité européen pour la standardisation électrotechnique qui fixe que la quantité de brome qu'un plastique doit contenir pour être considéré bromé est	Après l'obtention des plastiques issus du processus de démantèlement des D3E, nous opérons un premier tri pour séparer les plastiques noir des plastiques blancs, ensuite un second tri plus précis pour identifier et séparer les polymères contenant des additifs halogénés, notamment les retardateurs de flamme bromés. Ces plastiques sont par la suite fractionnés en morceaux et conditionnés dans des sacs de 100 kilos. Par ailleurs, une étude a été faite sur la teneur en brome de plusieurs de nos échantillons de plastique. En voici les principales conclusions : • Sur une masse totale d'échantillons de 42,85 kg, la masse de brome correspond à 0,67 kg. Cela veut dire que sur TOUS NOS PLASTIQUES TESTES il y a 1,6% en masse de brome (= 16 000 ppm). Donc nous sommes au dessus (en masse moyennée) de la limite à 2000 ppm. • Selon le Comité européen pour la standardisation électrotechnique qui fixe que la quantité de brome qu'un plastique doit contenir pour être considéré bromé est de 2000 pm : 19% (en masse totale) de nos plastiques sont "bromés".	

~~Party~~Respondent	Response	HexaBDE and heptaBDE – measures in place	TetraBDE and pentaBDE– measures in place	If No, reasons provided
		de 2000 pm : 19% (en masse totale) de nos plastiques sont "bromés". • Si on considère la limite de l'INERIS (moins de 100 mg par kg = 100 ppm), on monte à 29% (en masse totale) de nos échantillons qui sont considérés bromés. • Nos 8 types de plastiques les plus bromés ont des pourcentages de masse bromée allant de 5% de masse pondérée bromée en moyenne à 10%. On peut noter que des plastiques dont le code d'identification de l'industrie les qualifie de non bromé sont en fait bromés... Ce sont dans l'ordre : o ABS Noir FR o ABS Noir non bromé o ABS Blanc non bromé o ABS Blanc FR o ABS Blanc FR 17 o PS Blanc FR 17 o ABS Noir FR 17 o PET • Le plastique le plus bromé que nous ayons testé est à 17400 ppm, c'est-à-dire que 17,3% de sa masse est du brome.	• Si on considère la limite de l'INERIS (moins de 100 mg par kg = 100 ppm), on monte à 29% (en masse totale) de nos échantillons qui sont considérés bromés. • Nos 8 types de plastiques les plus bromés ont des pourcentages de masse bromée allant de 5% de masse pondérée bromée en moyenne à 10%. On peut noter que des plastiques dont le code d'identification de l'industrie les qualifie de non bromé sont en fait bromés... Ce sont dans l'ordre : o ABS Noir FR o ABS Noir non bromé o ABS Blanc non bromé o ABS Blanc FR o ABS Blanc FR 17 o PS Blanc FR 17 o ABS Noir FR 17 o PET • Le plastique le plus bromé que nous ayons testé est à 17400 ppm, c'est-à-dire que 17,3% de sa masse est du brome.	
Canada	No			PBDEs were added to the Prohibition of Certain Toxic Substances Regulations, 2012. While the Regulations do not specifically address recycling activities, the manufacture of products using recyclable material that contains PBDEs is prohibited.
Chile	Currently being developed			
Côte d'Ivoire	Not answered			

~~Party~~Respondent	Response	HexaBDE and heptaBDE – measures in place	TetraBDE and pentaBDE– measures in place	If No, reasons provided
Estonia	Yes	There are general waste management requirements for persistent organic pollutants and there are waste-stream specific requirements. E.g. for end-of-life vehicles and electric and electronic equipment there is a requirement to separately collect the parts (mainly plastic) which contain brominated flame retardants.	There are general waste management requirements for persistent organic pollutants and there are waste-stream specific requirements. E.g. for end-of-life vehicles and electric and electronic equipment there is a requirement to separately collect the parts (mainly plastic) which contain brominated flame retardants.	
Germany	Yes	will be filled in later	will be filled in later	
Guyana	No			Lack of financial resources. Lack of technical capacity.
Hungary	Currently being developed			
Kyrgyzstan	No			Lack of financial resources. Lack of technical capacity.
Lebanon	Not answered			
Luxembourg	Yes	Article 23 from "loi modifiée du 21 mars 2012 relative à la gestion des déchets" Controlled management of waste flows by specialized separation facilities.	Article 23 from "loi modifiée du 21 mars 2012 relative à la gestion des déchets" Controlled management of waste flows by specialized separation facilities.	
Maldives	No			Maldives dont use PBDE articles currently
Mauritius	No			Lack of technical capacity. Inventory of articles containing brominated diphenyl ethers has not yet been undertaken.
Mexico	No			Lack of financial resources. Lack of technical capacity.
Monaco	No			Substance ni produite ni utilisée à Monaco
Montenegro	No			Lack of financial resources.

~~Party~~Respondent	Response	HexaBDE and heptaBDE – measures in place	TetraBDE and pentaBDE– measures in place	If No, reasons provided
New Zealand	No			Have not registered for the recycling exemption, no national capability for recycling this material.
Norway	Yes	Some waste treatment plants in Norway use sensor-based technology to detect bromine content and to sort the plastic in bromine- and non-bromine containing fractions. The bromine containing plastic is incinerated as hazardous waste. The non-bromine containing plastics is recycled. The technology does not differentiate between different brominated substances. Waste treatment plants without the appropriate sorting tehcnologies in place must, based on an assessment of risk, destroy any fractions that contain POP-BDEs.	Some waste treatment plants in Norway use sensor-based technology to detect bromine content and to sort the plastic in bromine- and non-bromine containing fractions. The bromine containing plastic is incinerated as hazardous waste. The non-bromine containing plastics is recycled. The technology does not differentiate between different brominated substances. Waste treatment plants without the appropriate sorting tehcnologies in place must, based on an assessment of risk, destroy any fractions that contain POP-BDEs.	
Peru	No			Lack of technical capacity.
Poland	No			The European Union had notified the Secretariat of the registration for the specific exemptions regarding recycling of articles that contain or may contain tetrabromodiphenyl ether, pentabromodiphenyl ether, hexabromodiphenyl ether and heptabromodiphenyl ether, and the use and final disposal of articles manufactured from recycled materials that contain or may contain tetrabromodiphenyl ether, pentabromodiphenyl ether, hexabromodiphenyl ether and heptabromodiphenyl ethe, but it was Withdrawn on 28/11/2019.
Portugal	Not answered			
Romania	No			Lack of financial resources. Lack of technical capacity.

~~Party~~Respondent	Response	HexaBDE and heptaBDE – measures in place	TetraBDE and pentaBDE– measures in place	If No, reasons provided
Russian Federation	Currently being developed			
Sao Tome and Principe	No			Lack of financial resources. Lack of technical capacity.
Serbia	Yes	Ministry of Environmental Protection was prepared the Guidance for identification and separation of PBDEs from waste for recycling industry using handle separation combined with XRF Screening according to the SC Guidelines recommendations.	Ministry of Environmental Protection was prepared the Guidance for identification and separation of PBDEs from waste for recycling industry using handle separation combined with XRF Screening according to the SC Guidelines recommendations.	
Spain	Not answered			
Sri Lanka	No			Lack of financial resources. Lack of technical capacity. No legal provisions available for separate articles. Discussions are to be held on the implementation of EPR (Extended Producer Responsibility) for the items that contain Bromine once it is introduced under the National Environment Act (NEA).
Suriname	No			Lack of financial resources. Lack of technical capacity.
Switzerland	No			Articles that contain or may contain brominated diphenyl ethers are disposed of by incineration when becoming waste.
Thailand	Currently being developed			
Turkey	No			Lack of technical capacity. Lack of enforcement mechanism.
United Kingdom	Yes	In the UK, handlers of waste are obligated under Regulation (EU) 2019/1021 on POPs to separate wastes contaminated with	In the UK, handlers of waste are obligated under Regulation (EU) 2019/1021 on POPs to separate wastes contaminated with PBDEs	

~~Party~~Respondent	Response	HexaBDE and heptaBDE – measures in place	TetraBDE and pentaBDE– measures in place	If No, reasons provided
		PBDEs and to ensure that the POP content is destroyed or irreversibly transformed before materials can be recycled.	and to ensure that the POP content is destroyed or irreversibly transformed before materials can be recycled.	
United States	Not answered			
Zimbabwe	No			Lack of financial resources. Lack of technical capacity.

Question 7: Has your country used articles manufactured from recycled materials that contain or may contain brominated diphenyl ethers?

~~Party~~Respondent	Response	If Yes – information on articles	If "Other", please specify
Australia	Yes	Not answered	
Austria	Yes	Not answered	
Bosnia and Herzegovina	Information not available		
Bulgaria	Information not available		
Cameroon	Yes	nous avons reconditionné environ 61t de D3E sur le total collecté (7,9t en 2019), soit environ 4000 appareils qui ont été remis en état puis revendus localement.	
Canada	Information not available		
Chile	Information not available		
Côte d'Ivoire	Not answered		
Estonia	Information not available		
Germany	Yes	will be filled in later	
Guyana	Information not available		
Hungary	Information not available		
Kyrgyzstan	Information not available		
Lebanon	Not answered		
Luxembourg	Information not available		
Maldives	Information not available		

~~Party~~Respondent	Response	If Yes – information on articles	If "Other", please specify
Mauritius	Not answered		Inventory of articles containing brominated diphenyl ethers has not yet been undertaken.
Mexico	Information not available		
Monaco	No		
Montenegro	No		
New Zealand	Information not available		
Norway	No		
Peru	Information not available		
Poland	Not answered		The European Union had notified the Secretariat of the registration for the specific exemptions regarding recycling of articles that contain or may contain tetrabromodiphenyl ether, pentabromodiphenyl ether, hexabromodiphenyl ether and heptabromodiphenyl ether, and the use and final disposal of articles manufactured from recycled materials that contain or may contain tetrabromodiphenyl ether, pentabromodiphenyl ether, hexabromodiphenyl ether and heptabromodiphenyl ethe, but it was withdrawn on 28/11/2019.
Portugal	Not answered		
Romania	Information not available		
Russian Federation	Information not available		
Sao Tome and Principe	Information not available		
Serbia	Yes	NA	
Spain	Not answered		
Sri Lanka	Yes	We have done an analysis on 'Toxic elements present in imported plastic toys available in the local market'. Majority of local toy manufacturers are small firms and we mostly import	

~~Party~~Respondent	Response	If Yes – information on articles	If "Other", please specify
		toys. Some in this sector may produce toys from recycled plastics of electronic waste (e-waste) and end-of-life vehicles (ELVs). Because of the chemical stability of Brominated Flame Retardants (BFRs), they are widely used in EEE (Electrical and Electronic Equipment) and (Electrical and Electronic Equipment related Waste). As these recycled plastics are often incorporated into toy manufacturing; Brominated compounds unintentionally exist in children's toys. Sri Lanka has safety regulations only for some design and construction stages. No safety regulation or quality checking for import toys.	
Suriname	Information not available		
Switzerland	No		
Thailand	Information not available		
Turkey	Information not available		
United Kingdom	Not answered		As noted previously, results from a recent UK study indicate that articles which were previously considered to be POPs free do contain PBDEs and are now required to be dealt with according to EU regulations on POPs. The results from the study indicate varying levels of PBDEs in some articles in use in the UK, including some lower levels which can indicate that those articles are made from recycled materials which contained traces of PBDEs. When those articles which have been found to contain levels of PBDEs higher than the limits set out in Regulation (EU) 2019/1021 on POPs become waste they must be separated from other wastes and the POP content destroyed or irreversibly transformed.
United States	Not answered		
Zimbabwe	Information not available		

Question 8: Has your country disposed of articles manufactured from recycled materials that contain or may contain brominated diphenyl ethers?

~~Party~~Respondent	Response	If Yes – information on articles	If "Other", please specify
Australia	Yes	Not answered	
Austria	Yes	Not answered	
Bosnia and Herzegovina	Information not available		
Bulgaria	Information not available		
Cameroon	Yes	nous avons reconditionné environ 61t de D3E sur le total collecté (7,9t en 2019), soit environ 4000 appareils qui ont été remis en état puis revendus localement.	
Canada	Information not available		
Chile	Information not available		
Côte d'Ivoire	Not answered		
Estonia	Information not available		
Germany	Yes	will be filled in later	
Guyana	Information not available		
Hungary	Information not available		
Kyrgyzstan	Information not available		
Lebanon	Not answered		
Luxembourg	Information not available		
Maldives	Information not available		

~~Party~~Respondent	Response	If Yes – information on articles	If "Other", please specify
Mauritius	Not answered		Inventory of articles containing brominated diphenyl ethers has not yet been undertaken.
Mexico	Information not available		
Monaco	No		
Montenegro	No		
New Zealand	Information not available		
Norway	No		
Peru	Information not available		
Poland	Not answered		The European Union had notified the Secretariat of the registration for the specific exemptions regarding recycling of articles that contain or may contain tetrabromodiphenyl ether, pentabromodiphenyl ether, hexabromodiphenyl ether and heptabromodiphenyl ether, and the use and final disposal of articles manufactured from recycled materials that contain or may contain tetrabromodiphenyl ether, pentabromodiphenyl ether, hexabromodiphenyl ether and heptabromodiphenyl ethe, but it was withdrawn on 28/11/2019.
Portugal	Not answered		
Romania	Information not available		
Russian Federation	Information not available		
Sao Tome and Principe	Information not available		
Serbia	Yes	NA	
Spain	Not answered		
Sri Lanka	Yes	We have done an analysis on 'Toxic elements present in imported plastic toys available in the local market'. Majority of local toy manufacturers are small firms and we mostly import	

~~Party~~Respondent	Response	If Yes – information on articles	If "Other", please specify
		toys. Some in this sector may produce toys from recycled plastics of electronic waste (e-waste) and end-of-life vehicles (ELVs). Because of the chemical stability of Brominated Flame Retardants (BFRs), they are widely used in EEE (Electrical and Electronic Equipment) and (Electrical and Electronic Equipment related Waste). As these recycled plastics are often incorporated into toy manufacturing; Brominated compounds unintentionally exist in children's toys. Sri Lanka has safety regulations only for some design and construction stages. No safety regulation or quality checking for import toys.	
Suriname	Information not available		
Switzerland	No		
Thailand	Information not available		
Turkey	Information not available		
United Kingdom	Not answered		As noted previously, results from a recent UK study indicate that articles which were previously considered to be POPs free do contain PBDEs and are now required to be dealt with according to EU regulations on POPs. The results from the study indicate varying levels of PBDEs in some articles in use in the UK, including some lower levels which can indicate that those articles are made from recycled materials which contained traces of PBDEs. When those articles which have been found to contain levels of PBDEs higher than the limits set out in Regulation (EU) 2019/1021 on POPs become waste they must be separated from other wastes and the POP content destroyed or irreversibly transformed.
United States	Not answered		
Zimbabwe	Information not available		

Question 9: Has your country taken any steps to prevent the export of articles manufactured from recycled materials that contain levels or concentrations of brominated diphenyl ethers exceeding those permitted for the sale, use, import or manufacture of those articles within its territory, in accordance with paragraph 1 (b) of Part IV and/or Part V of Annex A?

~~Party~~Respondent	Response	HexaBDE and heptaBDE– measures taken	TetraBDE and pentaBDE – measures taken	If No, reasons provided
Australia	No			Lack of technical capacity.
Austria	Not answered			
Bosnia and Herzegovina	Currently being developed			
Bulgaria	Currently being developed			
Cameroon	No			Lack of financial resources. Lack of technical capacity. Lack of legal, institutional or policy framework. Le cas échéant nous pourrions dans le futur exporter des fractions plastiques contenant des PBDE, si nous déterminons que les seules filières satisfaisantes se trouvent à l'étranger.
Canada	Yes	PBDEs were added to the Prohibition of Certain Toxic Substances Regulations, 2012. While the Regulations do not specifically address recycling activities, the manufacture of products using recyclable material that contains PBDEs is prohibited.	PBDEs were added to the Prohibition of Certain Toxic Substances Regulations, 2012. While the Regulations do not specifically address recycling activities, the manufacture of products using recyclable material that contains PBDEs is prohibited.	
Chile	No			Debido a la falta de recursos financieros y capacidad técnica no se han identificados en el país artículos destinados al reciclaje que puedan contener estos compuestos. A raíz de lo anterior, aún no se han establecido marcos jurídicos que permitan regular estas materias.

~~Party~~Respondent	Response	HexaBDE and heptaBDE– measures taken	TetraBDE and pentaBDE – measures taken	If No, reasons provided
Côte d'Ivoire	Not answered			Lack of technical capacity.
Estonia	Yes	When end-of-waste status is given to an article or material from recycled waste the same quality requirements are in place (which include also chemical legislation) irrelevant whether these articles or products are exported or placed on the internal market.	When end-of-waste status is given to an article or material from recycled waste the same quality requirements are in place (which include also chemical legislation) irrelevant whether these articles or products are exported or placed on the internal market.	
Germany	Yes	will be filled in later	will be filled in later	
Guyana	Currently being developed			
Hungary	Yes	Articles containing concentrations at or above 0,1 % of tetra-, penta-, hexa- or heptabromodiphenyl ether by weight when produced partially or fully from recycled materials or materials from waste prepared for re-use are banned to export according to Part 1 of Annex V. of Regulation (EU) No 649/2012 of the European Parliament and of the Council.	Articles containing concentrations at or above 0,1 % of tetra-, penta-, hexa- or heptabromodiphenyl ether by weight when produced partially or fully from recycled materials or materials from waste prepared for re-use are banned to export according to Part 1 of Annex V. of Regulation (EU) No 649/2012 of the European Parliament and of the Council.	
Kyrgyzstan	No			Lack of financial resources. Lack of technical capacity. Lack of legal, institutional or policy framework.
Lebanon	Not answered			
Luxembourg	Yes	2004: Interdiction de la mise sur le marché et de l'utilisation. Règlement grand-ducal du 30 avril 2004 portant quinzième modification de l'annexe 1 de la loi modifiée du 11 mars 1981 portant réglementation de la mise sur le marché et de l'emploi de certaines substances et préparations dangereuses. 2006: Limitation d'utilisation dans les équipements électriques et électroniques.	2004: Interdiction de la mise sur le marché et de l'utilisation. Règlement grand-ducal du 30 avril 2004 portant quinzième modification de l'annexe 1 de la loi modifiée du 11 mars 1981 portant réglementation de la mise sur le marché et de l'emploi de certaines substances et préparations dangereuses. 2006: Limitation d'utilisation dans les équipements électriques et électroniques.	

~~Party~~Respondent	Response	HexaBDE and heptaBDE– measures taken	TetraBDE and pentaBDE – measures taken	If No, reasons provided
		Règlement grand-ducal du 18 janvier 2005 relatif aux déchets des équipements électriques et électroniques ainsi qu'à la limitation d'emploi de certains de leurs composants dangereux. 2010: Interdiction de la production, de la détention, de la mise sur le marché et de l'utilisation. Convention de Stockholm sur les polluants organiques persistants, faite à Stockholm, le 22 mai 2001. – Adoption et entrée en vigueur d'amendements aux annexes A, B et C. Règlement (CE) n°850/2004, repealed by Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants 2012: Loi modifiée du 21 mars 2012 relative à la gestion des déchets	Règlement grand-ducal du 18 janvier 2005 relatif aux déchets des équipements électriques et électroniques ainsi qu'à la limitation d'emploi de certains de leurs composants dangereux. 2010: Interdiction de la production, de la détention, de la mise sur le marché et de l'utilisation. Convention de Stockholm sur les polluants organiques persistants, faite à Stockholm, le 22 mai 2001. – Adoption et entrée en vigueur d'amendements aux annexes A, B et C. Règlement (CE) n°850/2004, repealed by Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants 2012: Loi modifiée du 21 mars 2012 relative à la gestion des déchets	
Maldives	Currently being developed			
Mauritius	No			No such manufacturer companies exist in the country.
Mexico	No			Lack of financial resources. Lack of technical capacity. Lack of legal, institutional or policy framework.
Monaco	No			Substance ni produite ni utilisée à Monaco
Montenegro	No			Lack of financial resources.
New Zealand	No			Not relevant as there is no recycling of materials containing BDEs within New Zealand.
Norway	Yes	See response to question 2, 5 and 6.	See response to question 2, 5 and 6.	
Peru	No			Lack of legal, institutional or policy framework.
Poland	Yes	Articles containing concentrations at or above 0,1 % of tetra-, penta-, hexa- or heptabromodiphenyl ether by weight when produced partially or fully	Articles containing concentrations at or above 0,1 % of tetra-, penta-, hexa- or heptabromodiphenyl ether by weight when produced partially or fully	

~~Party~~Respondent	Response	HexaBDE and heptaBDE– measures taken	TetraBDE and pentaBDE – measures taken	If No, reasons provided
		from recycled materials or materials from waste prepared for re-use subject to export ban according to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals (OJ L 201 27.7.2012, p. 60, with l.a.).	from recycled materials or materials from waste prepared for re-use subject to export ban according to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals (OJ L 201 27.7.2012, p. 60, with l.a.).	
Portugal	Not answered			
Romania	No			Lack of financial resources. Lack of technical capacity.
Russian Federation	Yes	Decision of the Board of the Eurasian Economic Commission No. 108 (entered into force on September 30, 2017) approved a list of standards for the application and compliance with the requirements of the technical regulation of the Union “On the Limitation of the Use of Hazardous Substances in Electrical and Radio Electronics Products" (EAEU TR 037/2016) “Products of electrical engineering and radio electronics” - products whose functioning as intended is determined by the presence, use, development, conversion, transmission and distribution of electric currents and (or) electromagnetic fields that are intended for direct use or are built into machines, mechanisms, apparatuses, devices and other equipment; EAEU TR 037/2016 established the maximum permissible concentration (in weight percent) of hazardous substances in products of electrical engineering and radio electronics - polybrominated diphenyls - not more than 0.1, polybrominated diphenylethers - not more than 0.1. For EAEU TR 037/2016, a list of standards has been adopted containing the rules and test methods, including sampling rules required to comply with the requirements of the regulation and to assess the conformity of objects of technical regulation. Method for determining the level of	Decision of the Board of the Eurasian Economic Commission No. 108 (entered into force on September 30, 2017) approved a list of standards for the application and compliance with the requirements of the technical regulation of the Union “On the Limitation of the Use of Hazardous Substances in Electrical and Radio Electronics Products" (EAEU TR 037/2016) “Products of electrical engineering and radio electronics” - products whose functioning as intended is determined by the presence, use, development, conversion, transmission and distribution of electric currents and (or) electromagnetic fields that are intended for direct use or are built into machines, mechanisms, apparatuses, devices and other equipment; EAEU TR 037/2016 established the maximum permissible concentration (in weight percent) of hazardous substances in products of electrical engineering and radio electronics - polybrominated diphenyls - not more than 0.1, polybrominated diphenylethers - not more than 0.1. For EAEU TR 037/2016, a list of standards has been adopted containing the rules and test methods, including sampling rules required to comply with the requirements of the regulation and to assess the conformity of objects of technical regulation. Method for determining the level of polybromobiphenyls (PBB) and polybrominated	

~~Party~~Respondent	Response	HexaBDE and heptaBDE– measures taken	TetraBDE and pentaBDE – measures taken	If No, reasons provided
		polybromobiphenyls (PBB) and polybrominated diphenyl ethers (PBDE) in electrical products: STB IEC 62321-2012 Electrotechnical products. Determination of the level of six regulated substances (lead, mercury, cadmium, hexavalent chromium, polybromobiphenyls, polybrominated diphenyl ethers) (status - used in the EAEU).	diphenyl ethers (PBDE) in electrical products: STB IEC 62321-2012 Electrotechnical products. Determination of the level of six regulated substances (lead, mercury, cadmium, hexavalent chromium, polybromobiphenyls, polybrominated diphenyl ethers) (status - used in the EAEU).	
Sao Tome and Principe	No			Lack of legal, institutional or policy framework.
Serbia	Yes	According to the provisions of the Law on Chemicals, Articles contain PBDEs are subject of PIC Procedure before export.	According to the provisions of the Law on Chemicals, Articles contain PBDEs are subject of PIC Procedure before export.	
Spain	Not answered			
Sri Lanka	No			Lack of financial resources. Lack of technical capacity. Lack of legal, institutional or policy framework. Information is not available
Suriname	No			Lack of financial resources. Lack of technical capacity. Lack of legal, institutional or policy framework.
Switzerland	Yes	To be completed.	To be completed.	
Thailand	Currently being developed			
Turkey	No			Lack of financial resources. Lack of technical capacity.
United Kingdom	Yes	In the UK, the placing on the market of articles containing PBDEs, including exports to 3rd countries, is prohibited under Regulation (EU) 2019/1021 on POPs. The export of waste articles contaminated with PBDEs is prohibited under Regulation (EU) 649/2012 concerning the export and import of hazardous chemicals which implements the Rotterdam Convention on Prior	In the UK, the placing on the market of articles containing PBDEs, including exports to 3rd countries, is prohibited under Regulation (EU) 2019/1021 on POPs. The export of waste articles contaminated with PBDEs is prohibited under Regulation (EU) 649/2012 concerning the export and import of hazardous chemicals which implements the Rotterdam Convention on Prior	

~~Party~~Respondent	Response	HexaBDE and heptaBDE– measures taken	TetraBDE and pentaBDE – measures taken	If No, reasons provided
		Informed Consent. Whilst these regulations prohibit the movement of articles and wastes contaminated with PBDEs beyond UK borders, UK regulators also take an intelligence based approach to ensure these regulations are applied fully. In 2019, in response to the results of the recent UK project which has identified that some WEEE streams may contain PBDEs, UK regulators notified industry that those affected streams must be subject to export controls.	Informed Consent. Whilst these regulations prohibit the movement of articles and wastes contaminated with PBDEs beyond UK borders, UK regulators also take an intelligence based approach to ensure these regulations are applied fully. In 2019, in response to the results of the recent UK project which has identified that some WEEE streams may contain PBDEs, UK regulators notified industry that those affected streams must be subject to export controls.	
United States	Not answered			
Zimbabwe	No			Lack of technical capacity. Lack of legal, institutional or policy framework.

Appendix II

Summary of information on the elimination of POP-BDEs contained in the fourth national reports submitted by Parties pursuant to Article 15 of the Stockholm Convention

1. As of 1 October 2020, the following 78 countries have submitted their fourth national reports[1]:

Geographic region	Party
Africa	Cameroon; Côte d'Ivoire; Democratic Republic of the Congo; Ghana; Malawi; Morocco; Mauritius; Rwanda; Sao Tome & Principe; South Africa; Uganda; Zimbabwe
Asia and Pacific	Cambodia; China; Cyprus; Japan; Indonesia; Kazakhstan; Kiribati, Kyrgyzstan; Lebanon; Oman; Republic of Korea; Singapore; Sri Lanka; Thailand; Turkey; United Arab Emirates; Yemen
CEE	Armenia; Azerbaijan; Belarus; Bosnia & Herzegovina; Bulgaria; Croatia; Czechia; Estonia; Georgia; Latvia; Lithuania; North Macedonia; Romania; Russian Federation; Serbia; Slovenia; Ukraine
GRULAC	Argentina; Bolivia; Brazil; Chile; Colombia; Costa Rica; Cuba; Ecuador; El Salvador; Mexico; Nicaragua; Peru; Guyana; Saint Kitts & Nevis; Suriname; Trinidad & Tobago; Uruguay; Venezuela
WEOG	Australia; Belgium; Canada; Denmark; Finland; Germany; Ireland; Monaco; Netherlands; New Zealand; Norway; Poland; Spain; Sweden; United Kingdom

2. Response with regard to BDEs to question 5: Has your country prohibited and/or taken any legal and administrative measures necessary to eliminate releases from intentional production and use of chemicals listed in Annex A in accordance with paragraph 1 (a) of Article 3 of the Convention, or restrict the production and use of the chemicals listed in Annex B to the Convention, in accordance with paragraph 1 (b) of Article 3 of the Convention?

Geographic region	Yes	No	Being developed
Africa	Cameroon; Malawi; Mauritius; Rwanda; Zimbabwe	Côte d'Ivoire; Democratic Republic of the Congo; Morocco; Sao Tome & Principe (TetraBDE)	Ghana; Sao Tome & Principe (HexaBDE); South Africa
Asia and Pacific	Cambodia; China; Cyprus; Japan; Kazakhstan; Kyrgyzstan (TetraBDE); Lebanon; Oman; Republic of Korea; Singapore; Sri Lanka; Thailand; United Arab Emirates; Yemen		Indonesia; Kyrgyzstan (HexaBDE); Turkey
CEE	Belarus; Bosnia & Herzegovina; Bulgaria; Croatia; Czechia; Estonia; Georgia; Latvia; Lithuania; North Macedonia; Romania; Serbia; Slovenia; Ukraine (HexaBDE)	Russian Federation	Armenia; Ukraine (TetraBDE)
GRULAC	Argentina; El Salvador; Guyana; Trinidad & Tobago; Venezuela	Bolivia; Brazil; Colombia; Costa Rica; Cuba; Mexico; Nicaragua; Peru; Uruguay	Ecuador; Saint Kitts & Nevis

[1] Information available at: http://chm.pops.int/Countries/NationalReports/FourthRoundPartyReports/tabid/6346/Default.aspx# .

Geographic region	Yes	No	Being developed
WEOG	Australia; Belgium; Canada; Denmark; Finland; Germany; Ireland; Monaco; Netherlands; New Zealand; Norway; Poland; Spain; Sweden; United Kingdom		

No information provided: Azerbaijan; Chile; Suriname; Uganda

3. Parties that have responded "yes" with regard to POP-BDEs to question 18: Has your country developed strategies for identifying products and articles in use and wastes consisting of, containing, or contaminated with chemicals listed in Annex A, B or C, in accordance with paragraph 1 (a) (ii) of Article 6 of the Convention?

   Bulgaria (2012), Cameroon (2016), Canada (2008), Colombia (2017, 2018), Czechia (2010/12), Germany (2009), Ireland (2013), Kazakhstan (2017), Mexico (2016), Netherlands (2011), New Zealand (2013), Republic of Korea (2011), Romania (2012), Singapore (2011).

4. Parties that have responded "yes" with regard to POP-BDEs to question 19: Has your country taken any measures to manage wastes, including products and articles upon becoming wastes, in accordance with paragraph 1 (d) of Article 6 of the Convention?

   Bulgaria (2012), Canada (2008), Colombia (2017, 2018), El Salvador (2017), Germany (2009), Ireland (2017), New Zealand (2011), Republic of Korea (2011), Romania (2010), -Spain (2010, 2014), Turkey (2009, 2012), United Arab Emirates (2015).

5. Parties that have responded "yes" with regard to POP-BDEs to question 20 with regard to POP-BDEs: Has your country disposed of wastes consisting of or containing chemicals listed in Annex A, B, or C to the Convention in an environmentally sound manner, in accordance with paragraph 1 (d) (ii) of Article 6 of the Convention?

   None

6. Parties that have responded "yes" with regard to POP-BDEs to question 21: Has your country developed strategies for identifying sites contaminated by chemicals listed in Annex A, B or C, in accordance with paragraph 1 (e) of Article 6 of the Convention?

   Bosnia and Herzegovina (2014), Bulgaria (2012), Republic of Korea (2011), Romania (2012), Turkey (2014).

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Appendix III

Summary of information about the inventories of brominated diphenyl ethers provided by Parties in their revised and updated national implementation plans (NIPs)

1. Transmission rates

As of 1 October 2020, the following 97 Parties[1] had submitted NIPs updated to reflect changes in obligations arising from the addition of POP-BDEs to Annex A of the Convention:

Geographic region	Party
Africa	Algeria, Benin, Burundi, Cabo Verde, Cameroon, Côte d'Ivoire, The Gambia, Ghana Guinea; Guinea-Bissau; Kenya, Liberia, Madagascar, Malawi, Morocco, Niger, Nigeria, Rwanda, Sao Tome and Principe; Senegal, Seychelles, Sierra Leone, Sudan, Togo, Tunisia, Uganda, Zimbabwe.
Asia and Pacific	Afghanistan, Cambodia, China, Cyprus, Indonesia, Japan, Jordan, Kazakhstan, Kiribati, Kyrgyzstan, Lao People's Democratic Republic, Lebanon, Maldives, Mongolia, Nepal, Pakistan, Philippines, Samoa, Solomon Islands, Sri Lanka, Turkey, United Arab Emirates, Viet Nam.
CEE	Albania, Armenia, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Estonia, Georgia, Hungary, Lithuania, Montenegro, North Macedonia, Poland, Romania, Russian Federation, Slovakia.
GRULAC	Argentina, Bolivia, Brazil, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Suriname, Trinidad and Tobago, Uruguay.
WEOG	Austria, Belgium, Canada, Denmark, European Union, Finland, France, Germany, Iceland, Ireland, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, United Kingdom.

2. Information on the inventory of POP-BDEs

Table 1. Summary of information on the inventory of hexaBDE and heptaBDE contained in EEE and WEEE.

Party	Year(s) of the inventory	Amount of POP-BDEs[2] (kg)		
		Imported in EEE	In use/stockpiled EEE	WEEE
Albania	2014	1.73	1,079	69
Algeria	2014	63,720[3]	29,882.52[4]	30,489[5]
Argentina	2014		121,640	
Armenia	2000-2005		11,663	
Benin	2014		16,838	1,699
Bosnia & Herzegovina	2012	205.75	11,411	2,080

[1] Available at http://chm.pops.int/Implementation/NIPs/NIPTransmission/tabid/253/Default.aspx. Accessed 1 October 2020.

[2] Values are for quantities of heptaBDE and hexaBDE and were calculated as being 54% of c-octaBDE quantities reported.

[3] TVs and PCs imported during the period 1975-2004.

[4] Sum of use (articles manufactured between 2002 and 2004 incl.) and stocks (articles manufactured between 1995 and 2001 incl.).

[5] Waste flows between 1975 and 2004.

Party	Year(s) of the inventory	Amount of POP-BDEs[2] (kg)		
		Imported in EEE	In use/stockpiled EEE	WEEE
Brazil	2012		858,800[6]	
Bulgaria	2006-2011			2209
Burundi	2016		3,867	
Cabo Verde	--		689	
Cambodia	2014		4,455	
Cameroon	2014		9,867	
Colombia	2012	2,839	325	3,733
Costa Rica	2013	9	15,851	1,753.04
Côte d'Ivoire	2014	63,285	12,076	
Croatia	2013	3	10,245	1,270
The Gambia	2011	5	810	
Kenya	2012		2,472.90	143,190
Georgia			4,671[7]	
Germany	2008			18,650[8]
Ghana	2016	3,430[9]	43,900	143,000
Guatemala	2015	972	9,378	1,731[10]
Guinea-Bissau	2014	2	1,080	108
Guinea	2013	127,416	71,054	1,549,704
Honduras	2012			1,681.35
Indonesia	2013	140,899	290,000	
Jordan	2007		6,041	
Kyrgyzstan	2015		15,885	
Lao People's Democratic Republic	2013	79.4	2052	1044
Lebanon	2016	724		
Lithuania	2014	721	9,972	1,197
Madagascar	2013	25	12,173	2,536
Malawi	2016		13,550	2,065
Mongolia	2012	3,906.5	2276.8	276.7
Montenegro	2016	2.2	1,851	433
Morocco	2013	118	38,908	5,906
Nepal	2014-15		31,102	
Nigeria	2010	5,330	479,500	20,180
North Macedonia	2012		3,551	2,715
Pakistan			826,207	
Panama	2017		50,290	
Paraguay	2015	46,198	454,826	66,631

[6] This amount was not allocated to any phase and was assumed to be contained in stockpiles.

[7] Calculated from the estimated range of 4.4 to 12.9 tonnes POP-BDEs.

[8] Average value for BDEs for a range between 1,700 and 35,600 kg.

[9] Total imported 2006-2014.

[10] Amount of POP-BDEs in polymers recycled in 2015.

Party	Year(s) of the inventory	Amount of POP-BDEs[2] (kg)		
		Imported in EEE	In use/stockpiled EEE	WEEE
Philippines	2012	61,543	93,400	
Rwanda	2014	2498		522
Samoa	2018		229.5	
Sao Tome and Principe	2015	0.14	19	
Senegal	2013	131	24,986	833
Seychelles	2014	783,5	2512	721
Sudan	2012		14,166	
Suriname	2016	554	70	480
Togo	2014		1,443	
Tunisia	2017[11]		20,199	
Turkey	2013	210,996	90,729	23,210
Uganda	2014		38,713[12]	
Uruguay	2015	24,791	1,177,263[13]	2,837,512[14]
Viet Nam	2014		306,754[15]	
Zimbabwe	2014		11,600	

[11] Date of NIP.

[12] Calculated from the sum of POP-PBDEs in EEE from household stocks and CRTs in current use.

[13] Contained in households and institutional EEE.

[14] Mean of estimated minimum and maximum POP-PBDE in WEEE. Includes POP-PBDE in exported WEEE (between 111 kg and 1,886 kg).

[15] Total accumulated plastic and total accumulated PBDE (2014 includes the previous years).

Table 2. Summary of information on the inventory of POP-BDEs contained in the transport sector.

Party	Year(s) of the inventory	Amount of POP-BDEs (kg)		
		Imported vehicles	In use/stockpiled vehicles	End-of-life vehicles
Albania	2014		25,078	4,724
Algeria	2014		3,603	5,035
Argentina	2014		12,900	6,148
Benin	2014	185	1481	178
Bosnia & Herzegovina	2011, 2012, 2013	914,241	417	231
Brazil	2012		39,500	694,015
Bulgaria	2001-2010	260,400[16]	658,000	71,700
Burundi	2016	3	534	38
Cabo Verde	2010		419	
Cambodia	2014	2,379[17]		
Cameroon	2014		4,171[18]	
Colombia	2012	[19]	19,984	4,062
Costa Rica	2013	238	8,139	0.07
Côte d'Ivoire	2014	1,290		
Croatia	2013	20	7,911	229
The Gambia	2011	461[20]		
Georgia		91,000[21]		
Germany	2010			6,000
Ghana	2016	3,217.5	31,824	1,500
Guatemala	2015	31,897[22]	121,356	1,462.5
Guinea-Bissau	2014	22	494	20
Guinée	2013	441	1,932	1,401
Honduras	2005		21,494	
Indonesia	2013	59,390[23]		45,785
Jordan	2014		12,977	
Kyrgyzstan	2015		8,995	
Lao People's Democratic Republic	2013	13	2,444	932
Lebanon	2016		10,500	
Liberia	2014		373	
Madagascar	2013	73	1,397	
Malawi			260	

[16] This value includes 900 kg of c-pentaBDE exported.

[17] Sum of tetraBDE and pentaBDE in registered vehicles manufactured between 1975 and 2004.

[18] ELV and vehicles in use (Sum of tetraBDE + pentaBDE + c-octaBDE*0.54).

[19] The 9,046 kg c-pentaBDE in imported vehicles (1975 to 2004 model year) from the 2012 vehicle fleet in Colombia is included in the total BDE in vehicles in use column.

[20] C-pentaBDE in vehicles imported between 2007 and 2011.

[21] Imported vehicles manufactured between 1975 and 2004.

[22] C-PentaBDE in expected future imports.

[23] Total import from 1975-2004.

Party	Year(s) of the inventory	Amount of POP-BDEs (kg)		
		Imported vehicles	In use/stockpiled vehicles	End-of-life vehicles
Mongolia	2012	95,117	58,130	16
Montenegro	2016		966	24
Morocco	2013		19,891	11
Nepal	2014-15		3079	
Nigeria	2010	2,048	214,500	1,853
North Macedonia	2012	164	3,338	864
Pakistan	2009	29,981	280,882	
Panama	2017		4,270	
Paraguay	2015	20	4574	484
Philippines	2012		22,000	2,003
Rwanda	2014	20	931	
Senegal	2013		2842	951[24]
Seychelles	2014		120	47
Sudan	2012	4,600[25]	36,460	1,100
Suriname	2015	1032[26]	620	1067
Togo	2014		1,028[27]	
Tunisia	2017[28]		24,726	
Turkey	2012	39,932[29]	57,536	295,540
Uganda	2014	427	7,534	502
Uruguay	2015		7,734	11
Viet Nam	2011	343	6,378	
Zimbabwe	2015		24,900	

[24] Amount for 2005-2013.

[25] In vehicles imported from 1995 to 2009.

[26] Amount of POP-PBDE in vehicles imported between 1998 and 2013.

[27] Total of imported, in use/stock and end-of-life vehicles.

[28] Date of NIP.

[29] Amount of PBDE in imported vehicles is included in the amount of PBDE in vehicles in use.

Appendix IV

Register of specific exemptions for tetrabromodiphenyl ether and pentabromodiphenyl ether

Party	Expiry date	Estimated quantity of production / use	Purpose(s) of production / use	Reason for exemption	Remarks
Brazil	Not known at this time	Not known at the time	In accordance with Part V of Annex A	Some articles containing this commercial mixture could still be in use in Brazil and some may be recycled.	None
Japan	Not provided	N/A	Recycling plastics from post-consumer use specific home appliances (Air-conditioner, TV sets, refrigerator, freezer, washing machine and clothes dryer) and personal computers to construction materials and daily necessities such as hanger and bookends.	Recycling post-consumer use specific home appliances is an obligation for home appliances manufacturers and importers under Home Appliance Recycling Law. It is necessary to enable recycling of plastics from post-consumer use specific home appliances to maintain appropriate management system of the post-consumer specific home appliances and establish a sound material-cycle society. Recycling of such plastics is operated in environmentally sound manner under the law. Recycling used personal computers is an obligation for personal computers manufacturers and importers under Law for the Promotion of Effective Utilization of Resources. It is necessary to enable recycling of plastics from used personal computers to maintain appropriate management system of the used personal computers and establish a sound material-cycle society. Recycling of such plastics is operated in environmentally sound manner under the law.	Approximately 108,000 tons of plastics from post-consumer use specific home appliances which might contain the chemicals are recycled annually. Approximately 6,000 tons of used personal computers are recycled annually. On average, the weight of plastics which might contain the chemicals listed above is approximately 15% of total weight of personal computers.
Republic of Korea		Not known	In accordance with Part V of Annex A	While manufacture, import and use of tetra- and pentaBDE are prohibited, some products and articles containing the chemicals could still be in use and recycled	None
Turkey	Not provided	Not known as yet	In accordance with Part V of Annex A	Country data not yet established	None
Expired and withdrawn specific exemptions					
Canada	Withdrawn on 11/02/2020	Not known at the time	In accordance with Part IV of Annex A	While manufacture, import and use of C-PentaBDE commercial mixtures are prohibited, some	Paragraph 1(b) of Part IV does not apply to Canada as Canada has

Party	Expiry date	Estimated quantity of production / use	Purpose(s) of production / use	Reason for exemption	Remarks
			(Decision SC-4/18)	articles containing this commercial mixture could still be in use in Canada and some may be recycled.	not set levels / concentrations on articles for permitted sale, use, import or manufacture at this time.
Czechia	Expired on 26/08/2015	Not provided	Articles in accordance with the provisions of Part V of Annex A		*On registration:* None.
European Union	Withdrawn on 28/11/2019	Not known at the time	In accordance with Part V of Annex A	While the production, placing on the market and use of tetrabromodiphenyl ethers and pentabromodiphenyl ethers are prohibited. Some recycling of articles containing these substances and produced before introduction of the ban cannot be excluded	*On registration:* None.
Iran (Islamic Republic of)	Expired on 26/08/2015. Five years as allowed by the Convention as of 26 August 2010	Not known at the time		Country data not yet established	*On registration:* Country data not yet established.
Japan	Withdrawn on 21/04/2014.	N/A	Recycling Automobile Shredder Residues (ASR) to Refuse Paper and plastic Fuel (RPF). Recycling ASR to Recycled Sound-Proofing Products (RSPP). Recycling plastics from used specific home appliances (air conditioner, television sets, refrigerator, freezer, washing machine and clothes dryer) and personal computers to construction material and daily necessities such as hangers and bookends.	Recycling of ASR is an obligation for automobile manufacturers and importers under the Law for the Recycling of End-of-Life Vehicles. It is necessary to enable recycling of ASR to maintain appropriate management system of End-of-Life Vehicles. Recycling of ASR is operated in environmentally sound manner under the law. Recycling used specific home appliances is an obligation for home appliance manufacturers and importers under the Home Appliance Recycle law. It is necessary to enable recycling of plastics from used specific home appliances to maintain appropriate management system of the used specific home appliances and establish a sound material -cycle society. Recycling of such plastics is operated in environmentally sound manner under the law. Recycling used personal computers is an obligation for personal computer manufacturers and importers under the law for the Promotion of Effective Utilization of Resources. It is	

Party	Expiry date	Estimated quantity of production / use	Purpose(s) of production / use	Reason for exemption	Remarks
				necessary to enable recycling of plastics from used computers to maintain appropriate management system of the used personal computers and establish a sound material-cycle society. Recycling of such plastics is operated in environmentally sound manner under the law.	
Viet Nam	Expired on 26/08/2015. Five years	To be updated	Recycling	Recycling of articles that contain or may contain tetrabromodiphenyl ether and pentabromodiphenyl ether, and the use and final disposal of articles manufactured from recycled materials that contain or may contain tetrabromodiphenyl ether and pentabromodiphenyl ether still exist.	*On registration:* Vietnam is in the process of PBDE inventory and development of methodology to control the recycling activities of PBDE materials.

Register of specific exemptions for hexabromodiphenyl ether and heptabromodiphenyl ether

Party	Expiry date	Estimated quantity of production / use	Purpose(s) of production / use	Reason for exemption	Remarks
Brazil	Not known at this time	Not known at this time	In accordance with Part IV of Annex A	Some articles containing this commercial mixture could still be in use in Brazil and some may be recycled.	None
Cambodia	Not provided	Not known	In accordance with Part IV of Annex A	CRT casings of TVs and of monitors of PC containing HexaBDE and HeptaBDE are recycled within the country.	None
Japan	Not provided	N/A	Recycling plastics from post-consumer use specific home appliances (Air-conditioner, TV sets, refrigerator, freezer, washing machine and clothes dryer) and personal computers to construction materials and daily necessities such as hanger and bookends.	Recycling post-consumer use specific home appliances is an obligation for home appliances manufacturers and importers under Home Appliance Recycling Law. It is necessary to enable recycling of plastics from post-consumer use specific home appliances to maintain appropriate management system of the post-consumer specific home appliances and establish a sound material-cycle society. Recycling of such plastics is operated in environmentally sound manner under the law. Recycling used personal computers is an obligation for personal computers	Approximately 108,000 tons of plastics from post-consumer use specific home appliances which might contain the chemicals are recycled annually. Approximately 6,000 tons of used personal computers are recycled annually. On average, the weight of plastics which might contain the chemicals listed above is approximately 15% of total weight of personal computers.

Party	Expiry date	Estimated quantity of production / use	Purpose(s) of production / use	Reason for exemption	Remarks
				manufacturers and importers under Law for the Promotion of Effective Utilization of Resources. It is necessary to enable recycling of plastics from used personal computers to maintain appropriate management system of the used personal computers and establish a sound material-cycle society. Recycling of such plastics is operated in environmentally sound manner under the law.	
Republic of Korea		Not known	In accordance with Part IV of Annex A	While manufacture, import and use of hexa- and heptaBDE are prohibited, some products and articles containing the chemicals could still be in use and recycled	None
Turkey	Not provided	Not known as yet	In accordance with Part IV of Annex A	Country data not yet established	None
Expired and withdrawn specific exemptions					
Canada	Withdrawn on 11/02/2020	Not known at this time	In accordance with Part IV of Annex A (Decision SC-4/14)	While manufacture, import and use of C-OctaBDE commercial mixtures are prohibited, some articles containing this commercial mixture could still be in use in Canada and some may be recycled.	Paragraph 1(b) of Part IV does not apply to Canada as Canada has not set levels/concentrations on articles for permitted use, import or manufacture at this time.
Czechia	Expired on 26/08/2015	Not provided	In accordance with Part IV of Annex A	Not provided	*On registration:* None.
European Union	Withdrawn on 28/11/2019	Unknown	In accordance with Part IV of Annex A	While the production, placing on the market and use of hexabromodiphenyl ethers and heptabromodiphenyl ethers are prohibited, some recycling articles containing these substances and produced before introduction of the ban cannot be excluded.	*On registration:* None.
Iran (Islamic Republic of)	Expired on 26/08/2015	Not known as yet	Use	Country data not yet established	*On registration:* Country data not yet established.

Party	Expiry date	Estimated quantity of production / use	Purpose(s) of production / use	Reason for exemption	Remarks
Japan	Withdrawn on 21/04/2014	N/A	Recycling Automobile Shredder Residues (ASR) to Refuse Paper and plastic Fuel (RPF). Recycling ASR to Recycled Sound-Proofing Products (RSPP). Recycling plastics from used specific home appliances (air conditioner, television sets, refrigerator, freezer, washing machine and clothes dryer) and personal computers to construction material and daily necessities such as hangers and bookends.	Recycling of ASR is an obligation for automobile manufacturers and importers under the Law for the Recycling of End-of-Life Vehicles. It is necessary to enable recycling of ASR to maintain appropriate management system of End-of-Life Vehicles. Recycling of ASR is operated in environmentally sound manner under the law. Recycling used specific home appliances is an obligation for home appliance manufacturers and importers under the Home Appliance Recycle law. It is necessary to enable recycling of plastics from used specific home appliances to maintain appropriate management system of the used specific home appliances and establish a sound material -cycle society. Recycling of such plastics is operated in environmentally sound manner under the law. Recycling used personal computers is an obligation for personal computer manufacturers and importers under the law for the Promotion of Effective Utilization of Resources. It is necessary to enable recycling of plastics from used computers to maintain appropriate management system of the used personal computers and establish a sound material-cycle society. Recycling of such plastics is operated in environmentally sound manner under the law.	