



## Stockholm Convention on Persistent Organic Pollutants

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### Conference of the Parties to the Stockholm Convention on Persistent Organic Pollutants Seventh meeting

Geneva, 4–15 May 2015

Item 5 (a) (iv) of the provisional agenda\*

**Matters related to the implementation of the Convention:  
measures to reduce or eliminate releases from intentional  
production and use: brominated diphenyl ethers and  
perfluorooctane sulfonic acid, its salts and perfluorooctane  
sulfonyl fluoride**

### **Compilation of information submitted by parties on their experiences in implementing the recommendations set out in the annex to decision POPRC-6/2 on the elimination of brominated diphenyl ethers from the waste stream and on risk reduction for perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride**

#### **Note by the Secretariat**

1. As referred to in the note by the Secretariat on evaluation of perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride pursuant to paragraphs 5 and 6 of part III of Annex B to the Convention (UNEP/POPS/COP.7/8), the annex to the present note sets out a compilation of information submitted by parties on their experiences in implementing the recommendations set out in the annex to decision POPRC-6/2.
2. Pursuant to decision SC-5/5, the Secretariat received information from twelve parties (Argentina, Bulgaria, Canada, Germany, Guatemala, Kiribati, Latvia, Mexico, Monaco, Nigeria, Sweden and Switzerland) and one observer (United States of America). The information received by the Secretariat was compiled and made available to the Conference of the Parties at its sixth meeting in document UNEP/POPS/COP.6/INF/7.
3. Pursuant to decision SC-6/7, the Secretariat invited parties that had not yet done so to submit information on their experiences in implementing the recommendations set out in the annex to decision POPRC-6/2, including on any challenges encountered. Following the invitation, the Secretariat received information from one party (The Netherlands).
4. The submission received in response to the request in decision SC-6/7, as well as the previous submissions received in response to decision SC-5/5, are compiled in the annex to the present note. The present note, including its annex, has not been formally edited.

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\* UNEP/POPS/COP.7/1.

## Annex

### Information submitted by parties on their experiences in implementing the recommendations set out in the annex to decision POPRC-6/2

Question 1. Registered for a specific exemption related to hexabromodiphenyl ether and heptabromodiphenyl ether and/or tetrabromodiphenyl ether and pentabromodiphenyl ether in accordance with part IV and/or part V of Annex A to the Stockholm Convention

Country	Specific exemption for hexabromodiphenyl ether and heptabromodiphenyl ether	Specific exemption for tetrabromodiphenyl ether and pentabromodiphenyl ether	Continued need for a specific exemption for hexabromodiphenyl ether and heptabromodiphenyl ether and/or tetrabromodiphenyl ether and pentabromodiphenyl ether	Reasons why not registered
Bulgaria	Yes	Yes	<p>The European Union, as a party to the Stockholm Convention, has registered for a specific exemption related to PBDE, regulated under the convention. Thus Bulgaria, as a member of the European Union, is registered, too. Regulation (EC) 850/2004 (as amended by regulation 756/2012 and 757/2012) has set concentrations limits for substances, preparations, and articles containing PBDE. Annex I Part A states as follows:</p> <p>Up to a concentration of equal to or below 10 mg/kg (0,001 % by weight) of Tetra-, Penta-, Hexa- and/or HeptaBDE this is considered as unintentional trace contamination. The production, placing on the market and use of articles and preparations produced partially or fully from recycled materials or materials from waste prepared for re-use, containing concentrations below 0,1 % Tetra-, Penta-, Hexa- and/or HeptaBDE by weight, shall be allowed. For electrical and electronic equipment the limits are set in Directive 2002/95/EC. Other than that, the use of articles already in use before 25 August 2010 containing Tetra-, Penta-, Hexa- and/or HeptaBDE shall be allowed. The requirements of the new Directive 2011/65/EC are in the process of transposing in the national legislation.</p> <p>Bulgaria has not yet conducted a study on PBDE and PFOS in waste products and recycling processes/loop. Such activity is envisaged in the Bulgarian Updated NIP for POPs, 2012 – 2020, which is just finalized and is in the stage of Council of Ministers Acceptance. However, preliminary survey (January – March 2012) on new articles and EEE placed on the market within 185 companies from various industrial sectors comes to the result, that:</p> <ul style="list-style-type: none"> <li>-No production of commercial mixtures of penta-BDE and octa-BDE was identified in the country;</li> <li>-No import or export of mixtures of penta-BDE and octa-BDE was registered in the country within the period 1996 – 2010;</li> <li>-Recycling processes have not been identified, where potentially POP-containing material enters into newly formed products;</li> <li>-It is estimated that Products containing recycled materials are within the allowed</li> </ul>	-

Country	Specific exemption for hexabromodiphenyl ether and heptabromodiphenyl ether	Specific exemption for tetrabromodiphenyl ether and pentabromodiphenyl ether	Continued need for a specific exemption for hexabromodiphenyl ether and heptabromodiphenyl ether and/or tetrabromodiphenyl ether and pentabromodiphenyl ether	Reasons why not registered
Canada	Yes	Yes	<p>concentration limit of PBDE;</p> <p>Canada has notified the Secretariat of the need for the specific exemptions under Part IV and V of Annex A for the use and final disposal of articles manufactured from recycled materials that contain or may contain these substances. While the manufacture of the tetraBDE, pentaBDE, hexaBDE, heptaBDE, octaBDE, nonaBDE and decaBDE congeners has been prohibited since 2008, along with prohibiting the import, use, sale, and offer for sale of the tetraBDE, pentaBDE and hexaBDE congeners, the exemptions are still needed until more is known about managing the use and final disposal of articles manufactured from recycled materials. To that effect, the environmentally sound disposal, storage and export of waste material containing BDEs will be addressed by the Basel Convention. More specifically, the upcoming new technical guidelines to be developed by the Basel Convention on the ESM of wastes containing BDEs will provide guidance to Parties.</p>	-
Germany	Yes	Yes	<p>Note: The EU Commission has very recently notified specific exemptions for Tetra- and Penta-BDEs as well as Hexa- and Hepta-BDEs (EU COM, 08.12.2012):</p> <p>The European Union, as a party to the Stockholm Convention, has registered for a specific exemption related to PBDE, regulated under the convention. Thus Germany, as a member of the European Union, is registered, too. EC Regulation 850/2004 (as amended by regulation 756/2012 and 757/2012) has set concentrations limits for substances, preparations, and articles containing PBDE. Annex I Part A states as follows:</p> <p>Up to a concentration of equal to or below 10 mg/kg (0,001 % by weight) of Tetra-, Penta-, Hexa- and/or HeptaBDE this is considered as unintentional trace contamination. The production, placing on the market and use of articles and preparations produced partially or fully from recycled materials or materials from waste prepared for re-use, containing concentrations below 0,1 % Tetra-, Penta-, Hexa- and/or HeptaBDE by weight, shall be allowed. For electrical and electronic equipment the limits are set in Directive 2002/95/EC. Other than that, the use of articles already in use before 25 August 2010 containing Tetra-, Penta-, Hexa- and/or HeptaBDE shall be allowed.</p> <p>Germany has conducted a study on PBDE and PFOS in products and recycling processes/loop. This study comes to the result, that:</p> <ul style="list-style-type: none"> <li>- New products placed on the market maintain within the allowed concentration of PBDE;</li> <li>- No recycling processes have been found, where potentially POP-containing material enters into newly formed products;</li> <li>- Products containing recycled materials stay within the allowed concentration limit of</li> </ul>	

Country	Specific exemption for hexabromodiphenyl ether and heptabromodiphenyl ether	Specific exemption for tetrabromodiphenyl ether and pentabromodiphenyl ether	Continued need for a specific exemption for hexabromodiphenyl ether and heptabromodiphenyl ether and/or tetrabromodiphenyl ether and pentabromodiphenyl ether	Reasons why not registered
			<p>PBDE</p> <ul style="list-style-type: none"> <li>- All waste-treatment processes in Germany lead to a destruction of possibly contained PBDE;</li> </ul> <p>Potential sources for emissions of PBDE into the environment are mechanical treatments of EEE and waste sites.</p> <p>While the production, placing on the market and use of hexabromodiphenyl ethers and heptabromodiphenyl ethers are prohibited, some recycling of articles containing these substances and produced before introduction of the ban cannot be excluded.</p>	
Mexico	No	No		
Monaco	No	No		Not needed
The Netherlands	Yes	Yes	<p>The European Union, as a party to the Stockholm Convention, has registered for a specific exemption related to the BDE-congeners regulated under the Stockholm Convention : « 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 if the ban cannot be excluded ». A similar exemption is registered for tetrabromodiphenyl ether and pentabromodiphenyl ether. As a member of the EU, the exemption accounts for the Netherlands as well.</p> <p>The Netherlands have conducted a survey to investigate the amounts of the four POP-BDEs listed in the Convention (tetra-, penta-, hexa- and hepta-bromodiphenyl ether) in various waste streams.</p> <p>Samples were taken and analyzed from different pkaces in the recycling chain of end-of-life vehicles (ELVs) and waste of electric and electronic equipment (WEEE).</p> <p>POP-BDEs were rarely found in single automotive parts or WEEE items. This in contrast to shredder material (consisting of a large number of shredded items), in which POP-BDEs are frequently found.</p> <p>The measurements confirmed that the congeners present in commercial pentaBDE could be detected in cars and ELVs, whereas the BDE pattern in WEEE confirmed the application of commercial octa-BDE in electric and electronic equipment.</p> <p>Although concentrations in plastic shredder fractions from WEEE are found to be somewhat higher than in plastic shredder fractions from ELV (both representative of the average plastics flow), the highest concentrations in single items were found in some ELV samples. No such hot spots were found for WEEE items: expected high POP-BDE concentrations in</p>	

<i>Country</i>	<i>Specific exemption for hexabromodiphenyl ether and heptabromodiphenyl ether</i>	<i>Specific exemption for tetrabromodiphenyl ether and pentabromodiphenyl ether</i>	<i>Continued need for a specific exemption for hexabromodiphenyl ether and heptabromodiphenyl ether and/or tetrabromodiphenyl ether and pentabromodiphenyl ether</i>	<i>Reasons why not registered</i>
			<p>old CRT TVs were not found in the samples. This indicates that a selective removal of POP-BDE containing plastics may be more challenging in the WEEE sector than in ELV processing.</p> <p>In terms of total amount of POP-BDEs the WEEE waste stream showed to be more relevant than the ELV waste stream. The WEEE waste stream amounted 72 kiloton's of plastics compared to 20 kiloton's for the ELV waste stream, whereas the average POP-BDE concentration in WEEE waste stream was almost ten times higher ; 97 and 10ug/g respectively, Corresponding masses of POP-BDEs were 7 and 0.2 tonnes of POP-BDEs per year in WEEE and ELV waste streams in the Netherlands.</p> <p>Base on the mass flow analysis, 22% of the POP-BDE in WEEE is expected to end up in recycled plastics. In the automotive sector, 14% of the POP-BDE is expected to end up in plastics recycling, while an additional 19% is expected to end up in second-hand parts (reuse).</p> <p>Leslie, HA, Leonards, PEG, Brandsma, SH and Jonkers, N, (2013). POP STREAM. POP-BDE waste streams in the Netherlands: analysis and inventory. IVM/IVAM Report R13-16</p>	
Sweden	No	No		Not needed
Switzerland	No	No		Not needed
United States	Yes	Yes	<p>The U.S. EPA designated manufacture and import of tetraBDE, pentaBDE, hexaBDE, and heptaBDE, except in articles, as significant new uses in 2005. If a person intends to initiate a significant new use, he must submit a significant new use notice (SNUN) to EPA for review 90 days in advance and receive EPA's approval. In April 2012, EPA proposed to amend the 2005 PBDE SNUR by including articles and processing as significant new uses for these and three other PBDEs (octaBDE, nonaBDE, and decaBDE).</p>	

**PART I: Evaluation of brominated diphenyl ethers pursuant to paragraph 2 of parts IV and V of Annex A to the Stockholm Convention on Persistent Organic Pollutants, including experience in implementing the recommendations in the annex to decision POPRC-6/2**

**Question 2. Actions or control measures taken to eliminate hexabromodiphenyl ether and heptabromodiphenyl ether and/or tetrabromodiphenyl ether and pentabromodiphenyl ether contained in articles**

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Actions or control measures for hexabromodiphenyl ether and heptabromodiphenyl ether	Actions or control measures for tetrabromodiphenyl ether and pentabromodiphenyl ether
Bulgaria	Yes	Yes	<p>No data on the use and production of hexabromodiphenyl ether and heptabromodiphenyl ether in Bulgaria (the survey covers the period 1996-2010).</p> <p>Bulgaria conducted a preliminary study on the existence of PFOS and PBDE in products and recycling processes. Directive 2002/95/EC of the European parliament and the Council restricts the use of PBDE in the homogeneous materials of electrical and electronic equipment above 0,1 % by weight (in force since 1 July 2006). Directive 2003/11/EC amending for the 24th time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations, restricts the use of c-Penta- and c-OctaBDE as substances, constituent of substances or in preparations in concentrations above 0.1 % by mass, since July 2006. Articles or flame-retarded parts thereof shall not be placed on the market if they contain c-Penta- or c-OctaBDE in concentrations higher than 0.1 % by mass. 185 companies from different industry sectors were requested to provide information about the placing on the market, use and import of PBDE in products and articles. The outcomes of the preliminary study are the following:</p> <p><u>Automotive Industry:</u></p> <ul style="list-style-type: none"> <li>- There in no production of cars in Bulgaria, only busses and trucks were produced.</li> <li>- All new and second-hand cars are imported from EU countries mainly and from other countries;</li> <li>- New vehicles produced after 2000 should be c-Penta and c-OctaBDE- free;</li> <li>- The vehicles on the market which are produced before 2000 will decline gradually, thus reduction of PBDE in products and waste is expected;</li> <li>- Specific peculiarity of Automobile Park in Bulgaria is its age</li> </ul>	

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Actions or control measures for hexabromodiphenyl ether and heptabromodiphenyl ether	Actions or control measures for tetrabromodiphenyl ether and pentabromodiphenyl ether
			<p>structure. According to the police statistics (2010) over 57% of the registered cars in Bulgaria are more than 15 years old. The number of second-hand cars registered in the country within the period 1992 – 2005 are approx. 2 413 000, which plastic parts may be flame retarded with c-pentaBDE;</p> <ul style="list-style-type: none"> <li>- The calculated indicative potential content of c-pentaBDE in the second-hand cars put on the market in the a.m. period is assumed to be approx. 658 tones at the estimation of 0.250 kg c-penta-BDE/1000 kg (0.025% by mass) per car, which is below the limit concentrations of 0.1 % by mass.</li> <li>- The collected ELV for dismantling, recovery and disposal within the period 2005 – 2011 in Bulgaria are estimated to be approx. 287 000 cars with potentially assumed content of c-pentaBDE approx. 71 tonnes.</li> <li>- Indicative amount of PBDE from automotive industry in waste stream for 2011 is not considered to exceed 0,1% by mass per car.</li> </ul> <p><u>Furniture/upholstery industry:</u></p> <ul style="list-style-type: none"> <li>- Currently (2000 - 2010) PBDE is not used in the production of PUR-foams, thus there is no potential source of BDE entries into the waste stream.</li> </ul> <p><u>EEE:</u></p> <ul style="list-style-type: none"> <li>- Since 1 July 2006 the products placed on the market in Bulgaria might contain only unintentional trace contamination PBDE;</li> <li>- Within the period 2006-2011 in the country totally 472 844 tones new EEO has been placed on the market and is not expected to contain more than 0,1% by mass c-pentaBDE;</li> <li>- The most likely source of waste plastic fractions, containing BFRs (c-octaBDE or c-decaBDE) is WEEE category 3 and 4;</li> <li>- The collected WEEE within 1 to 10 categories for dismantling, recovery and disposal within the period 2006 – 2011 in Bulgaria is estimated to be approx. 179 825 tones out of which 19 230 tones being WEEE category 3 and 4 with 3 444 tones waste</li> </ul>	

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Actions or control measures for hexabromodiphenyl ether and heptabromodiphenyl ether	Actions or control measures for tetrabromodiphenyl ether and pentabromodiphenyl ether
			<p>polymeric fractions.</p> <ul style="list-style-type: none"> <li>- Potentially assumed content of waste plastic fraction treated with BFR (c-octaBDE or c-decaBDE) is calculated to be approx. 42 tones, with potential content of c-octaBDE or c-decaBDE PBDE approx. to 4 tones;</li> <li>- No analysis of c-octaBDE or c-decaBDE content in waste plastic fractions from WEEE have been performed in Bulgaria, but it is assumed that their content is comparable with those identified in Europe and it is not expected the c-octaBDE concentrations in total collected mass of WEEE or mixed plastic fractions from different categories WEEE to exceed the limit concentration of 0,1% by mass.</li> <li>- Based on the average short life-span of EEE category 3 and 4 and the fact that EEE import is mainly from EU countries, it is considered that it is unlikely the collected WEEE within the period 2006 -2011 to result in c-octaBDE contents above 0,1% by mass.</li> </ul> <p>There is no hazardous waste incineration facility available in Bulgaria. All identified PBDE waste will be subject of further thermal destruction in EU.</p>	
Canada	Yes	Yes	Canada's <i>Polybrominated Diphenyl Ether Regulations, 2008</i> prohibit the manufacture, use, sale, offer for sale, and import of hexabromodiphenyl ether and prohibit the manufacture of heptabromodiphenyl ether.	Canada's <i>Polybrominated Diphenyl Ether Regulations, 2008</i> prohibit the manufacture, use, sale, offer for sale, and import of tetrabromodiphenyl ether and pentabromodiphenyl ether.
Germany	Yes	Yes	<p>According to the Directive 2003/11/EC, the use of commercial penta- and octaBDEs has been prohibited since June 2004. This was taken over to the REACH regulation.</p> <p>REACH annex XVII and the POPs regulation differ in the naming of the substances – REACH refers to penta- and octaBDE derivatives. The substances may be marketed up to a weight limit of 0.1 % in substances, mixtures or products. The POPs regulation is markedly more conservative: the limit value for substances, mixtures or products newly put on the market is set at 0.001% of the weight. Only products</p>	See for hexabromodiphenyl ether and heptabromodiphenyl ether

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Actions or control measures for hexabromodiphenyl ether and heptabromodiphenyl ether	Actions or control measures for tetrabromodiphenyl ether and pentabromodiphenyl ether
			<p>consisting totally or partly of recycled materials and electric appliances in the sense of RoHS are permitted a limit of 0.1 % for being marketed.</p> <p>See also German answer to this question from June 2012:</p> <p>Germany has conducted a study on the existence of PFOS and PBDE in products and recycling processes/loop. Directive 2002/95/EC of the European parliament and of the council restricts PBDE in Article 4. Herein it says, that “member states shall ensure that, from July 2006, new EEE put on the market does not contain [...] polybrominated diphenyl ethers (PBDE).” Directive 2003/11/EC restricts the use of C-Penta- and C-OctaBDE as substances, as constituent of substances or preparations, and placing on the market to concentrations below 0.1 % by mass. Articles or flame-retarded parts thereof may not be placed on the market if they contain C-Penta- or C-OctaBDE in concentrations higher than 0.1 % by mass. This restriction came into force in 2004. The consultant questioned different industry sectors about their use of PBDE. Results are (as already disclosed in our email from 02.04. 2012):</p> <p>Automotive Industry:</p> <ul style="list-style-type: none"> <li>- New vehicles are C-Penta and C-OctaBDE- free at least since 2000;</li> <li>- The stockpile of vehicles from years of construction until 2000 will decline gradually, thus a reduction of PBDE in products is given;</li> <li>- Significant amounts of waste-fractions containing PBDE are being burnt (stimulated by the German DepV of 2009, that bans deposition of fractions containing wastes listed in Annex V, Part 2 of EC Regulation 850/2004);</li> <li>- No PBDE from vehicles will get into the waste stream in 2030, all vehicles containing PBDE will be out of use until then (probably except for a couple of historic cars);</li> <li>- Estimated amount of PBDE in mass flow from automotive industry for 2010 are as follows: <ul style="list-style-type: none"> <li>o TetraBDE: Emissions 69 kg; waste stream 1096 kg</li> <li>o PentaBDE: Emissions 127.3 kg; waste stream 2108.8 kg</li> </ul> </li> </ul>	

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Actions or control measures for hexabromodiphenyl ether and heptabromodiphenyl ether	Actions or control measures for tetrabromodiphenyl ether and pentabromodiphenyl ether
			<ul style="list-style-type: none"> <li>○ HexaBDE: Emissions 23.2 kg; waste stream 479 kg</li> <li>○ HeptaBDE: Emissions 32 kg; waste stream 1208 kg</li> </ul> <p>Furniture/upholstery industry:</p> <ul style="list-style-type: none"> <li>- Now and retrospective until 1995 no usage of PBDE in the production of PUR-foams, thus no relevant source for BDE entries into the waste stream.</li> </ul> <p>EEE:</p> <ul style="list-style-type: none"> <li>- 2004 latest point in time, at which products placed on the market in Germany might contain PBDE (only unintentional trace contamination) → scenario maximum;</li> <li>- Voluntary initiatives of the industry to resign the use of PBDE and use other flame retardants instead in 1986, thus possibly no use of PBDE in articles as early as 1995 → scenario minimum;</li> <li>- Taking the average life-span of EEE results in the following: scenario minimum no PBDE in waste streams from EEE since 2006, scenario maximum: decline of PBDE in waste streams since 2009</li> <li>- Estimated amounts of PBDE in the waste stream in 2010:               <ul style="list-style-type: none"> <li>○ PentaBDE: 1.41 t</li> <li>○ HexaBDE: 2.22 t</li> <li>○ HeptaBDE: 13.35 t</li> </ul> </li> <li>- PBDE-containing plastic material has its end-of-life in thermal treatment (see above, automotive industry);</li> <li>- Considerable amounts of (W)EEE (old EEE, that are either waste or still working) are exported (illegally) and possibly lead to pollution in the country of destination;</li> </ul> <p>Due to historic reasons there is probably much contaminated WEE in disposal sites; analyses of leak water at disposal sites in Austria (Moche et al. 2004) show that there are PBDE present.</p>	
Mexico	No	No	Currently there are no activities regarding measures to eliminate Hexabromodiphenyl ether and heptabromodiphenyl ether in articles.	Currently there are no activities regarding measures to Tetrabromodiphenyl ether and

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Actions or control measures for hexabromodiphenyl ether and heptabromodiphenyl ether	Actions or control measures for tetrabromodiphenyl ether and pentabromodiphenyl ether
				pentabromodiphenyl ether in articles.
Monaco	No	No	Not used or produced in Monaco.	Not used or produced in Monaco.
The Netherlands	Yes	Yes	<p>The Stockholm Convention is implemented through EC regulation (EC) 850/2004 and its amendments which prohibits production, placing on the market and use of the four POP-BDE congeners. The prohibition became effective in 2010. The marketing and use of commercial pentaBDE and commercial octaBDE was already restricted in 2004 by means of Directive 2003/11/EC. The European regulations on production, placing on the market and use of POP-BDEs do not apply to articles containing BDEs already in use on the date of entry into force of the regulation. Under the EU Directive 2002/95EC application of polybromodiphenyl ethers is restricted in newly marketed electric and electronic equipment. Concentrations below 0.1% are being tolerated.</p> <p>The EU POP regulation ((EU) 859/2004) article 4 (1)(b) states that the production, placing on the market and use of POPs does not apply if the substance is occurring as an unintentional trace contaminant in substances, preparations or articles. For the individual POP-BDE substances a concentration limit of 0.001% is defined in regulation (EU) 757/2010: "For the purposes of this entry, Article 4 (1)(b) shall apply to concentrations of tetrabromodiphenyl ether equal to or below 10 mg/kg (0.001% by weight) when it occurs in substances, preparations, articles or as constituents of the flame-retarded parts of articles". The exemption for the other three POP-BDEs is similar.</p> <p>At present, the EU has registered an exemption under the Convention for the recycling of articles containing these substances and produced before introduction of the ban. Article 7 of the EU POP regulation describes the proper handling of POP-waste. Article 7 (2): waste consisting of, containing or contaminated by any substances listed in Annex IV (POPs) shall be disposed of or recovered, without undue delay and in accordance with Annex V, part 1 in such a way as to ensure that the persistent organic pollutant content is destroyed or irreversibly transformed so that the remaining waste and releases do not exhibit the characteristics of persistent organic pollutants. However, article 7(3) indicates that waste containing or contaminated by any substance listed in Annex IV (POPs)</p>	As for hexa- and hepta bromodiphenyl ether

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Actions or control measures for hexabromodiphenyl ether and heptabromodiphenyl ether	Actions or control measures for tetrabromodiphenyl ether and pentabromodiphenyl ether
			<p>may be otherwise disposed of or recovered in accordance with the relevant Community legislation, provided that the content of the listed substances in the waste is below the concentration limits to be specified in Annex IV. As of April 2014, the discussions within the EU on the concentration limits for the four POP-PBDEs in order to distinguish POP and non POP waste have not yet been finalized.</p> <p>The Netherlands conducted a study on the concentrations of POP-BDEs in various types of waste and the amounts present in these waste streams (ELV and WEEE waste streams) in order to get insight on the concentrations present and the amounts circulated. From the data available in the study mentioned under question 1 of this format, it can be deduced that:</p> <ul style="list-style-type: none"> <li>- Dutch production on penta and octa BDE has stopped before 1997</li> <li>- Active application of commercial octa and penta BDE has stopped more than a decade ago</li> <li>- PentaBDE was applied in a limited number of car models before 2000</li> </ul> <p>Service life of Dutch cars is on average 16.7 years, which implies that part of these cars have not been yet dismantled, but most will be before 2030. The amount of cars still containing POP-BDEs will gradually decline.</p> <p>Concentrations, but also total amount of POP-BDEs is large in WEEE waste stream than in ELV waste stream. Considerable amount of the plastics from ELVs and WEEEs ends up in incineration.</p>	
Sweden	Yes	Yes	<p>Ban on production and use in the EU since 2004.</p> <p>The Swedish legislation for pre-treatment of e-waste requires separation of plastics containing brominated flame-retardants. Recycling of plastics containing brominated flame retardants is not performed in Sweden and there is currently no demand for this kind of plastics by Swedish industry. The Swedish Recycling Industries Association has made a statement that BRF-containing plastics must be phased out and not recycled.</p>	<p>Ban on production and use in the EU since 2004.</p> <p>As for hexabromodiphenyl ether and heptabromodiphenyl ether</p>

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Actions or control measures for hexabromodiphenyl ether and heptabromodiphenyl ether	Actions or control measures for tetrabromodiphenyl ether and pentabromodiphenyl ether
Switzerland	Yes	Yes	<p>The marketing of new articles containing POP BDEs is banned, the maximum allowed level for unavoidable trace contamination is 0.001% or 0.1% if produced from recycled material or if the article is an electric or electronic device (see annex 1.9 and annex 2.18 of Ordinance on risk reduction related to the use of certain particularly dangerous substances, preparations and articles (SR 814.81). According to the Ordinance on the return, the taking back and the disposal of electrical and electronic appliances (SR 814.620) users who want to dispose of electrical or electronic equipment have to bring it back to suppliers of such equipments. The suppliers have to take it back and ensure that the disposal is carried out in an environmentally sound manner. According to article 6 letter c of SR 814.620 organic compounds of returned devices that are not used for recovery such as housings, cable isolations or synthetic resin boards have to be incinerated in appropriate installations. Waste treatment companies of hazardous waste or controlled waste need an operating authorization. They have to give information about the type of waste and how they treat it, what kind of installation they have... The reception of such waste has to be notified to the authorities (see Chapter 2 Ordinance on Movement of waste (SR 814.600)).</p>	As for hexabromodiphenyl ether and heptabromodiphenyl ether
United States			<p>In April 2012, EPA proposed to amend the 2005 PBDE SNUR by including manufacture, import, and processing of hexabromodiphenyl ether and heptabromodiphenyl ether in articles as significant new uses. As part of the Test Rule EPA proposed, if these significant new uses occur after Dec 31, 2013, testing for health and ecological effects must be done by manufacturer, importer, or processor.</p>	<p>In April 2012, EPA proposed to amend the 2005 PBDE SNUR by including manufacture, import, and processing of tetrabromodiphenyl ether and pentabromodiphenyl ether in articles as significant new uses. As part of the Test Rule EPA proposed, if these significant new uses occur after Dec 31, 2013, testing for health and ecological effects must be done by manufacturer, importer, or processor.</p>

**Question 3. Measures taken to implement the recommendations on the elimination of brominated diphenyl ethers from the waste stream in the annex to decision POPRC-6/2, or any other actions**

Country	Taken measures to implement the recommendations	Progress in implementing the recommendations or other actions
Bulgaria	No	<p>There is no “screening technique” for PBDE in the waste stream. The establishment of concentration limits for c-pentaPDE and c-octaBDE in the waste stream is currently under preparation and discussion (forthcoming amendment of Annexes IV and V of Regulation (EC) No. 850/2004 on POPs).</p> <p>No analysis of c-pentaBDE or c-octaBDE content in waste plastic fractions from WEEE and ELV have been performed in Bulgaria, but it is assumed that their content is comparable with that identified in Europe.</p>
Canada	In progress	<p>Many of the recommendations from the POPRC are linked to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal which governs the transboundary movement and sound management of hazardous wastes. The Basel Convention sets criteria, standards and other provisions for Environmentally Sound Management (ESM) including recycling, storage and disposal operations. To that effect, the environmentally sound disposal, storage and export of waste material containing BDEs will be addressed by the Basel Convention. More specifically, the upcoming new technical guidelines to be developed by the Basel Convention on the ESM of wastes containing BDEs will provide guidance to Parties.</p> <p>Canada identified that many of the BDEs recommendations seek to assess the long term chemistry of BDEs in landfill and releases from landfills into the environment. In 2006, the Government of Canada launched the Chemicals Management Plan (CMP). The Plan acts to safeguard human health and the environment of Canadians and includes a number of proactive measures to ensure that chemical substances are managed properly. A key element of the Chemicals Management Plan is the monitoring and surveillance of levels of harmful chemicals in Canadians and their environment.</p> <p>Environment Canada's national CMP Environmental Monitoring and Surveillance Program focuses on monitoring of chemicals in multiple environmental media: air, water, sediment, non-human biota (fish and wildlife), as well as source monitoring (wastewater treatment plant effluents and sludge, landfill leachate and biogas).</p> <p>Many of the emerging contaminants of concern are found in products which routinely end up in landfill or wastewater at the end-of-life. As part of the CMP, contaminants including BDEs have been sampled in leachate from 10-12 Canadian municipal solid waste landfills from 2008 to 2011. Canada has attached to its submission a summary of the data. It is believed that this information will be useful to identify and assess disposal options which are environmentally sound for wastes containing BDEs. This Canadian data set, along with experience in gathering it, will also be shared with the Basel Convention and the Small Intersessional Working Group (SIWG) on POPs. This group is preparing the new technical guidelines to be developed by the Basel Convention on the ESM of wastes containing BDEs. Canada is actively involved in the technical POPs work under the Basel Convention and chairs the POPs SIWG.</p> <p>Canada is also undertaking research, evaluating findings from new studies, collecting information and investigating potential releases of toxic substances, including BDEs, from waste management (e.g. landfills) and recycling facilities in Canada.</p> <p>Storage requirements for material and articles identified to contain BDEs are not specifically covered under Canadian legislation. General waste storage requirements exist under various Canadian regulations, including general waste management regulations and authorizations, and codes such as the material safety data sheet (MSDS) or the Canadian building codes. The upcoming new technical guidelines to be developed by the Basel Convention on the ESM of wastes containing BDEs will provide storage guidance to Parties.</p> <p>Analytical techniques and technologies to identify BDEs in plastics and other products are known and have been tested by Canadian</p>

Country	Taken measures to implement the recommendations	Progress in implementing the recommendations or other actions
		<p>companies and laboratories. International standards such as the IEC 62321 Ed.1 have been developed for electrotechnical products, and other standards are being used by Canadian companies to identify products or articles containing BDEs.</p> <p>Releases of BDEs in emission to air and residues from thermal process used to treat material contaminated with BDES are not specifically measured in Canada. However, recognizing the linkage with dioxins and furans and given Canada's existing action plan and requirements addressing dioxins and furans from waste incineration sources, it is anticipated that existing requirements for these substances, specifically implementing appropriate incineration technology and best management practices, are effective in reducing emissions of BDEs.</p>
Germany	Yes	<p>There is no "screening technique" for PBDE in the waste stream. However due to the German DepV (Verordnung über Deponien und Langzeitlager – ordinance on waste disposal sites and long term storages) of 2009, that bans deposition of fractions containing wastes listed in Annex V, Part 2 of EC Regulation 850/2004, and allows a maximum TOC (total organic carbon) of <math>\leq 6\%</math> by weight (subsurface disposal), of <math>\leq 3\%</math> by weight (above ground disposal sites or non hazardous and hazardous wastes), and <math>\leq 1\%</math> by weight (above ground disposal sites for wastes) and earlier mechanisms like the TA Siedlungsabfall (technical instructions on municipal waste) of 1993, that allowed a maximum TOC of <math>\leq 1\%</math> by weight (above ground disposal sites for wastes) and <math>\leq 3\%</math> by weight (above ground disposal sites for wastes), municipal wastes and wastes with a high TOC in general are treated thermally. This thermal treatment leads to a destruction of possible PBDE content. Emissions can occur around shredder plants. Shredder fractions are either treated thermally or used for building disposal sites.</p>
Mexico	In progress	<p>This year it is foreseen to carry out several workshops to train e-waste recycling enterprises on the sound environmental management of the electronic materials including plastics with PBDEs. This is in agreement with the legal framework of e-waste.</p>
Monaco	No	<p>Not used or produced in Monaco.</p>
The Netherlands	Yes	<p>The Netherlands have implemented a number of measures in compliance with the recommendations in annex to decision POPRC-6/2, as follows;</p> <p>The only on site technique to separate bromine containing material from non-bromine containing material is the X-Ray Fluorescence (XRF). This technique may be applied but it does not distinguish between the various bromine containing substances. As a result, it should be followed by other methods that can distinguish between the POP-BDEs and other bromine compounds that are still allowed. However, these methods take much longer processing and analysing time, and it can be questioned if they can be applied effectively in waste recycling practices at present.</p> <p>Production, placing on the market and use of articles containing POP-BDEs is prohibited.</p> <p>The Dutch Inspectorate reported in 2010 that the amount of plastics with flame retardants in WEEE had decreased from 37% in 2007 to 27% in 2008 and to 8% in 2009. It also investigated the amounts of prohibited BDEs in a number of consumer articles and has fined the producers/importers and has destroyed the articles containing these substances. Additional research work where POP-BDEs were measured in a number of new products showed that most of these contained POP-BDEs below the level of detection (LOD), while in some other products POP-BDEs were present in low amounts.</p> <p>Another study carried out in the Netherlands (referred to in question 2 of this format) indicates that a part of the plastics in ELVs and WEEE is being recycled and that the largest part is being incinerated. Incineration takes places under controlled conditions and a permit is needed.</p>

Country	Taken measures to implement the recommendations	Progress in implementing the recommendations or other actions
Sweden	Yes/in progress	<p>E-waste plastics containing brominated flame retardants are most commonly incinerated in Sweden for example by SAKAB (major Swedish plant authorized for incineration of hazardous waste). Some quantities may be exported, this will be investigated further. Recycling of plastics containing brominated flame retardants is not performed in Sweden and there is currently no demand for this kind of plastics by Swedish industry. The Swedish Recycling Industries' Association has made a statement that BFR-containing plastics must be phased out and not recycled.</p> <p>Residues from the fragmenting of end of life vehicles and e-waste could contain POPs flame retardants. The extent to which POPs flame retardants (c octa-BDE) are still present in end of life vehicles in Sweden will be further investigated. Sweden has had a ban on landfilling of organic waste for several years, however exemptions are given in some cases for shredder residues due to technical difficulties during incineration of this material. The landfilling of shredder residues should stop and the possibilities to improve incineration will be further investigated.</p> <p>Some screening and separation techniques are currently in use in Sweden e.g. manual sorting, screening for bromine using XRF-instrument and density separation of shredded plastics containing bromine. There is no recycling of material containing POPs flamed retardants in Sweden. Sweden has enough capacity to handle waste containing POPs and consequently the storage of such materials and articles will be very limited. Chapter 3 of the Swedish National Implementation Plan describes some further activities e.g. study of Swedish incineration capacity and providing guidance on the EU POPs regulation.</p>
Switzerland	Yes	See answers of questions 4.and 5.
United States	No	BDEs in household waste, particularly waste articles, are required to be disposed in municipal solid waste (MSW) landfills, which in the US have liners and leachate collection and treatment. The US considers such disposal of these articles to be ESM.

**Question 4. Establishment of national control schemes and/or national implementation plans in relation to bromodiphenyl ethers**

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for hexabromodiphenyl ether and heptabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for tetrabromodiphenyl ether and pentabromodiphenyl ether
Bulgaria	In progress	In progress	Directive 2002/95/EC of the European parliament and the Council restricts the use of PBDE in the homogeneous materials of electrical and electronic equipment above 0,1 % by weight (in force since 1 July 2006). Directive 2003/11/EC amending for the 24th time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations, restricts the use of c-Penta- and c-OctaBDE as substances, constituent of substances or in preparations in concentrations above 0.1 % by mass, since July 2006. Articles or flame-retarded parts	

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for hexabromodiphenyl ether and heptabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for tetrabromodiphenyl ether and pentabromodiphenyl ether
			<p>thereof shall not be placed on the market if they contain c-Penta- or c-OctaBDE in concentrations higher than 0.1 % by mass.</p> <p>No analysis of c-pentaBDE or c-octaBDE content in waste plastic fractions from WEEE and ELV have been performed in Bulgaria, but it is assumed that their content is comparable with that identified in Europe. Thus, no waste, containing more than 0,1% by mass PBDE were identified in the waste stream.</p> <p>The updated Bulgarian NIP for POPs, 2012 – 2020 includes measures and activities for identifying the PBDE (c-pentaBDE and c-octaBDE) content in the waste steam from WEEE and ELV.</p> <p>Material containing PBDE from WEEE entering the waste stream shall be treated thermally abroad; potentially PBDE containing material from cars is usually ends up in shredder plants, whose fractions will either be treated thermally abroad or used for building disposal sites.</p>	
Canada	Yes	Yes	Canada's Polybrominated Diphenyl Ether Regulations, 2008 prohibit the manufacture, use, sale, offer for sale, and import of hexabromodiphneyl ether and prohibit the manufacture of heptabromodiphenyl ether.	Canada's Polybrominated Diphenyl Ether Regulations, 2008 prohibit the manufacture, use, sale, offer for sale, and import of tetrabromodiphenyl ether and pentabromodiphenyl ether.
Germany	Yes	Yes	<p>The control of the limit values cited in the answer to question 3 is under the auspices of the "Länder", the Federal States.</p> <p>According to the Landfill Ordinance, wastes consisting of, containing or contaminated with POPs, i.e. wastes that exceed the lower limit value under Annex IV of Regulation (EC) No 850/2004, may not be disposed of at surface sites in Germany, i.e. only at underground landfill sites (which are all constructed in salt rock) or by means of stowage in mines in salt rock. The upper limit values therefore play no role in the disposal practice for wastes consisting of, containing or contaminated with POPs in Germany.</p> <p>German waste law lays down requirements concerning the collection, storage, transport (incl. transboundary shipments), recovery and disposal of wastes, as well as record keeping at both waste treatment</p>	As for hexabromodiphenyl ether and heptabromodiphenyl ether

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for hexabromodiphenyl ether and heptabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for tetrabromodiphenyl ether and pentabromodiphenyl ether
			<p>installations and disposal facilities.</p> <p>The Act Promoting Closed Substance Cycle Waste Management and Ensuring Environmentally Compatible Waste Disposal (Recycling Management Act - KrWG) of 24 February 2012 entered into force on 1 June 2012. In contrast to the previous legislation, it contains a hierarchy of waste management measures. It is, in particular, of significance for the disposal of wastes consisting of, containing or contaminated with POPs that 'priority should be given to the measure that best ensures the protection of humans and the environment where wastes are generated and managed, taking into consideration the precautionary principle and the principle of sustainability. The whole life cycle of the waste is to be taken as a basis for the analysis of the impacts on humans and the environment under the first sentence of this section'.</p> <p><b>Competences for functions under waste law</b></p> <p>The enforcement of waste law is the responsibility of the Länder, which are able to regulate their various functions and internal Land competences individually. In some Länder, there are obligations to supply or offer hazardous substances that require special supervision to the Land-owned companies responsible for the disposal of special wastes.<sup>1</sup></p> <p>With regard to transboundary movements of waste under Section 14(1) of the Waste Shipment Act (AbfVerbrG), Land authorities are responsible as a matter of principle for measures and duties in connection with the shipment of wastes from and into German territory. These Land authorities are published on an Internet site (UBA, 2010a). Under Section 14(4) of the AbfVerbrG, the Federal Environment Agency is responsible for transit movements.</p> <p><b>Disposal of POPs-contaminated wastes at landfills</b></p> <p>The provisions of Article 7(4) of Regulation (EC) No 850/2004 (POPs Regulation), which derogate from the requirement that POPs</p>	

<sup>1</sup> Further information can be found at <http://www.info-ags.de/>.

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for hexabromodiphenyl ether and heptabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for tetrabromodiphenyl ether and pentabromodiphenyl ether
			<p>be destroyed laid down in Article 7(2) by making it possible for POPs-contaminated wastes to be deposited at landfills, are implemented in their entirety in German law by the Landfill Ordinance (DepV). According to the DepV, wastes mentioned in Annex V to the POPs Regulation that exceed the concentration limits for the substances listed in Annex IV to the Regulation may not be deposited at surface landfills (Section 7(1)(7) DepV). The same applies for wastes containing other long-lived or bioaccumulative toxic substances that give grounds for concern that the public's welfare might be impaired if they were deposited at landfills.</p> <p>In practice, the concentration limits given in Annex IV to the POPs Regulation represent the limit values for landfill class III.</p> <p>Even stricter limit values apply when wastes are deployed at landfills to improve the geological barrier or in the recultivation layer.</p> <p>The Länder enforce individual limit values for classes I and II (landfills for non-hazardous wastes) that range between the values for classes 0 and IV. On the basis of a report from the Federation/Länder Working Group on Waste (LAGA) dated 21 June 2011, the Conference of Environment Ministers of the Federation and Länder recommends the application of proposed uniform limit values.</p> <p>According to Article 7(4)(b) of the POPs Regulation, the competent authority may also approve an alternative procedure provided for in Annex V when the Annex IV limit values are exceeded if it is demonstrated by the waste holder that the decontamination of the wastes and the destruction of the POPs does not represent the environmentally preferable option. Of the alternatives specified in Annex V to the POPs Regulation, only permanent deposition in underground landfills in salt rock is permitted by the DepV in Germany. Waste management records approved by the competent authority are to be presented to the operator of the underground landfill in good time before the first delivery of wastes.</p> <p>The reference to the POPS Regulation in the First Ordinance Amending the Landfill Ordinance is formulated flexibly ('as most recently amended'), so the DepV will always refer to most recent text</p>	

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for hexabromodiphenyl ether and heptabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for tetrabromodiphenyl ether and pentabromodiphenyl ether
			<p>of the Regulation whenever its annexes are amended.</p> <p><b>Use of wastes that contain POPs for mine stowage</b></p> <p>Section 4 of the Ordinance on Underground Waste Stowage (VersatzV) lays down limit values for certain parameters relevant to the stowage of waste underground. These limit values are quantified in Annex 2. PCBs are the only POPs covered by this Ordinance. Under Section 4(2), it is only permissible for the limit values to be exceeded in the following exceptional cases:</p> <ul style="list-style-type: none"> <li>• ‘where the geogenic levels of the same substances in the rock are not exceeded [not relevant for POPs],</li> <li>• where “incineration residues from the burning of coal” are stowed in carbonaceous and secondary rock and</li> <li>• where wastes are stowed in salt rock provided a long-term safety record is held’ (LAGA, 2010).</li> </ul> <p><b>Biowastes</b></p> <p>The Ordinance on Biowastes (BioAbfV) governs the recovery of composts from biowaste. A conclusive list of appropriate biowastes for the production of composts from households, commercial operations and production facilities has been compiled. This encompasses vegetable and animal waste substances, such as wastes from food processing, food wastes, garden and park wastes, etc. that contain biowastes. Limit values are stipulated for heavy metals, but not for organic pollutants.</p> <p>‘However, the BioAbfV imposes an obligation for the biowaste treatment entity to have tests for further pollutants carried out on the unmixed input materials or the treated biowastes, in particular if there are reasons to suspect elevated concentrations on account of the nature, properties or origins of the input materials (Section 4(8)). The obligation to test for additional pollutants covers POPs where there are corresponding reasons to suspect their presence.’ (LAGA, 2010)</p> <p>The new version of the Ordinance on Biowastes entered into force on 1 May 2012 (BioabfV, 2012). Information on the amended legislation</p>	

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for hexabromodiphenyl ether and heptabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for tetrabromodiphenyl ether and pentabromodiphenyl ether
			<p>and the updated German text of the Ordinance can be found along with other materials on the BMU's Internet site at <a href="http://www.bmu.de/abfallwirtschaft/abfallrecht/national/doc/40696.php">http://www.bmu.de/abfallwirtschaft/abfallrecht/national/doc/40696.php</a>.</p> <p><b>Sewage sludge</b></p> <p>The parameters and limit values for sewage sludge may be extended by the competent authority to further constituents (Section 3(5) AbfKlärV). This includes POP pollutants....</p> <p>In order to rule out any possible accumulation of pollutants in soil over the long term, efforts are being made to further tighten up the requirements placed on sewage sludges that may be used in agriculture. According to the Closed Substance Cycle and Waste Management Act, it will only be possible for chemical requirements for the utilisation of sewage sludges on agricultural land to be governed by waste law in future if the proper and harmless utilisation of sewage sludges is not already guaranteed by the provisions of fertiliser law (third sentence of Section 11(2) KrWG). ...</p> <p>At the same time as the developments discussed above, the proportion of sewage sludges disposed of thermally by means of co-incineration went up from 31.5% in 2004 to 53.2 % in 2010. The clear rise in the thermal treatment of sewage sludges is to be attributed to the requirements of the Waste Deposition Ordinance, according to which the deposition of untreated sewage sludges at landfills has been prohibited since 2005. The incineration of sewage sludges in incineration and co-incineration plants that are suitable for this purpose is therefore, alongside the use of sewage sludges on soils as fertilisers, the second pillar of sewage sludge disposal (UBA, 2012). However, incineration at mono-incineration plants is to be preferred because this is the only way of ensuring the raw materials contained in the sewage sludge ashes that are generated (particularly phosphorous) can be channelled into resource-efficient forms of reuse (BMU, 2011a, pp. 72f), unless the raw materials can be recovered prior to the thermal treatment.</p>	

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for hexabromodiphenyl ether and heptabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for tetrabromodiphenyl ether and pentabromodiphenyl ether
			<p><b>Contaminated sites/harmful soil contamination</b></p> <p>At present, more than 271,000 sites in Germany are officially suspected of being contaminated (BMU, 2011b). Details of the current numbers of designated sites can be obtained from the relevant contaminated site registers in the individual Länder or from the Federal Environmental Agency (LABO, 2011a; UBA, 2011a). As a rule, these sources provide information about all former uses, the technologies previously deployed at these sites and sector-specific types of contamination.</p> <p>References:</p> <p>BMU (2011a): Entwurf des BMU für ein Deutsches Ressourceneffizienzprogramm (ProgRes); <a href="http://www.bmu.de/wirtschaft_und_umwelt/downloads/doc/47843.php">http://www.bmu.de/wirtschaft_und_umwelt/downloads/doc/47843.php</a></p> <p>BMU (2011b): 'Bodenschutz und Altlasten: Situation'; <a href="http://www.bmu.de/bodenschutz/doc/2494.php">http://www.bmu.de/bodenschutz/doc/2494.php</a></p> <p>LABO (2011a): Federation/Länder Working Group on Soil Conservation (LABO): Internet site; <a href="http://www.labo-Deutschland.de/Startseite.html">http://www.labo-Deutschland.de/Startseite.html</a></p> <p>LAGA (2010): Federation/Länder Working Group on Waste: Jahresbericht der Bund/Länder-Arbeitsgemeinschaft Abfall (LAGA) 2010; <a href="http://laga-online.de/servlet/is/23875/LAGA_Ja_Ber2010.pdf?command=downloadContent&amp;filename=LAGA_JaBer_2010.pdf">http://laga-online.de/servlet/is/23875/LAGA_Ja_Ber2010.pdf?command=downloadContent&amp;filename=LAGA_JaBer_2010.pdf</a></p> <p>LAGA (2011): Federation/Länder Working Group on Waste: Jahresbericht der Bund/Länder-Arbeitsgemeinschaft Abfall (LAGA) 2011; <a href="http://www.laga-online.de/servlet/is/23875/LAGA_JaBer_2011.pdf?command=downloadContent&amp;filename=LAGA_JaBer_2011.pdf">http://www.laga-online.de/servlet/is/23875/LAGA_JaBer_2011.pdf?command=downloadContent&amp;filename=LAGA_JaBer_2011.pdf</a></p> <p>UBA (2010a): Competent Authorities in the Federal Republic of Germany for the Transboundary Movement of Waste (As of</p>	

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for hexabromodiphenyl ether and heptabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for tetrabromodiphenyl ether and pentabromodiphenyl ether
			<p>February 2012);  <a href="http://www.umweltdaten.de/abfallwirtschaft/gav/Genehmigungsbhoerden.pdf">http://www.umweltdaten.de/abfallwirtschaft/gav/Genehmigungsbhoerden.pdf</a></p> <p>UBA (2011a): ‘Indikator: Altlastenverdachtsflächen im Verhältnis zur Anzahl der Sanierungen’; February 2011;  <a href="http://www.umweltbundesamt-daten-zur-umwelt.de/umweltdaten/public/theme.do?nodeIdent=2900">http://www.umweltbundesamt-daten-zur-umwelt.de/umweltdaten/public/theme.do?nodeIdent=2900</a>;  and ‘Bundesweite Übersicht zur Altlastenstatistik’;  <a href="http://www.umweltbundesamt.de/boden-und-altlasten/altlast/web1/deutsch/1_3.htm">http://www.umweltbundesamt.de/boden-und-altlasten/altlast/web1/deutsch/1_3.htm</a></p> <p>UBA (2012): Abfallwirtschaft Entsorgungsverfahren; accessed 23 February 2012;  <a href="http://www.uba.de/abfallwirtschaft/entsorgung/index.htm">http://www.uba.de/abfallwirtschaft/entsorgung/index.htm</a></p> <p>Zangl, S., Blepp, M., Marquardt, M., Mochl, K., Wirth, O. (2012): Nationale Umsetzung des Stockholmer Übereinkommens zu persistenten organischen Schadstoffen (POPs) – PBDE und PFOS in Erzeugnissen und im Recyclingkreislauf. Umweltforschungsplan des Bundesministeriums für Umwelt, Naturschutz und Reaktorsicherheit Förderkennzeichen (UFOPLAN) 3710 63 415</p> <p>Zangl, S., Blepp, M., Marquardt, M., Mochl, K., Wirth, O. (2012): National-level implementation of the Stockholm Convention on persistent organic pollutants (POPs) – PBDE and PFOS in products and in the recycling loops (Summary report). Umweltforschungsplan des Bundesministeriums für Umwelt, Naturschutz und Reaktorsicherheit Förderkennzeichen (UFOPLAN) 3710 63 415</p> <p>(cited from the German National Implementation Plan, 2012)</p>	
Mexico	In progress	In progress	<p>End of life PBDE containing products (as e-waste) are considered as special waste and are regulated by the General Law for Waste Management (LGPGIR, by its abbreviation in Spanish) and its associated instruments (i.e. Standard NOM.161-SEMARNAT-2011). The law and the standard set the mandate to develop plans to manage the e-waste, which demand the participation of manufacturers, users,</p>	

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for hexabromodiphenyl ether and heptabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for tetrabromodiphenyl ether and pentabromodiphenyl ether
			distributors, government and recycles.	
Monaco	No	No	Not used or produced in Monaco.	Not used or produced in Monaco.
The Netherlands	Yes	Yes	The POP-BDEs were incorporated in the newest Dutch implementation plan and in the accompanying action plan that was submitted to the Stockholm Convention Secretariat in August 2011. The implementation plan stated: "To supplement the current waste stream policy, studies are in preparation at EU and national levels to obtain a better understanding of the presence of PFOS and BDEs in products and waste streams, and how to treat such streams". The action plan stated that the Netherlands will lend its support to developments leading to the adoption of concentration limits for POPs in waste matter on a European level, as well as the potential need for effective screening and separating waste streams. The study referred to under question 1 of this format is the result of that action.	As for hexa and hepta bromodiphenyl ether
Sweden	Yes	Yes	The Swedish legislation for pre-treatment of e-waste requires separation of plastics containing brominated flame-retardants. See below.	The Swedish legislation for pre-treatment of e-waste requires separation of plastics containing brominated flame-retardants. See below.
Switzerland	Yes	Yes	Switzerland has not established a low POP content for BDEs containing waste. However, materials in articles originating from recycling have to comply with a maximum allowed BDE content (see annex 1.9 of Ordinance on risk reduction related to the use of certain particularly dangerous substances, preparations and articles (SR 814.81)).	As for hexabromodiphenyl ether and heptabromodiphenyl ether

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for hexabromodiphenyl ether and heptabromodiphenyl ether	Establishment of national control schemes and/or national implementation plans for tetrabromodiphenyl ether and pentabromodiphenyl ether
United States	-	-	<p>EPA is encouraging a voluntary phase-out of manufacture and import of commercial decaBDE (c-decaBDE). Starting in 2010, EPA received commitments from the principal manufacturers and importers of c-decaBDE to initiate reductions in the manufacture, import and sale of c-decaBDE. As a result of negotiations, the principle companies have committed to ending production, importation and sales of decaBDE for most uses in the United States by December 31, 2012 and to end all uses by December 31, 2013. EPA is encouraging other importers of c-decaBDE to join this initiative by developing and alternatives assessment for c-decaBDE to aid users in selecting suitable alternatives.</p> <p>Additionally, EPA proposed a TSCA section 4 test rule for c-pentaBDE, c-octaBDE, and c-decaBDE. The test rule would require the development of information necessary to determine the effects of manufacturing, processing, or other activities involving these c-PBDEs on human health or the environment. EPA intends to promulgate the test rule if it determines that manufacture (including import) or processing of c-PBDEs, including in articles, has not ceased by December 31, 2013.</p> <p>For more information on the SNUR, test rule or commercial PBDE mixtures, please visit the EPA Existing Chemicals PBDE Summary page at <a href="http://www.epa.gov/oppt/existingchemicals/pubs/actionplans/pbde.html">http://www.epa.gov/oppt/existingchemicals/pubs/actionplans/pbde.html</a>.</p>	Same

## Question 5. Screening and separation techniques for wastes containing brominated diphenyl ethers

Country	Screening and separation techniques for wastes containing brominated diphenyl ethers	Remarks
Bulgaria	No	There is no “screening technique” for PBDE in the waste stream. The establishment of concentration limits for c-pentaPDE and c-octaBDE in the waste stream is currently under preparation and discussion (forthcoming amendment of Annexes IV and V of Regulation (EC) No. 850/2004 on POPs). All waste, potentially containing PBDE shall be treated either thermally abroad, so that PBDE content will be destroyed, or shall be treated in shredder plants, whose fractions then are either treated thermally and PBDE content is destroyed or used for building disposal sites.
Canada	No	It is anticipated that the new technical guidelines to be developed by the Basel Convention on the ESM of wastes containing BDEs will provide guidance to Parties on these types of management measures. However, Canada believes that a list of priority articles and wastes streams containing BDEs could be established to focus efforts on the application of screening techniques. From Canada’s point of view, the main streams for which BDEs could be tested and screened are electronic wastes as well as textiles and plastics in various products and articles at their end-of-life management including recycling. Canada is currently gathering information from Canadian recycling facilities on their experiences in applying screening techniques to various wastes streams to identify flame retardant chemicals.
Germany	No	No waste is deposited in landfills without prior treatment. See also answer to question 4a.
Mexico	No	Currently, the activities in Mexico have been focused on the evaluation of the current situation of PBDEs; the building of the analytical capacity for PBDE measure in plastics and environmental matrices, and the gathering of commerce information. The next steps will include the development of more technical projects regarding separation techniques containing PBDEs.
Monaco	No	Not applicable in Monaco.
The Netherlands	No	There is no effective screening technique available yet to distinguish between POP-BDE containing plastics and other plastics containing bromine. X-Ray Fluorescence may be applied, but does not distinguish between the various bromine containing substances. XRF may be used as first screening method, but is not legally prescribed. In the study referred to in question 2 of this format, the so-called atmospheric pressure chemical ionization-high resolution time-of-flight mass spectrometry (APCI-HR TOFMS) was applied as screening method before conventional analysis using GC.MS. A more extensive description of the method is provided in chapter 2.3.2 of the report containing that study. The method is relatively new and enables a rapid screening. However, the amount of equipment needed is too large for onsite screening. That same study showed that a large part of POP-BDE containing plastics are incinerated within the Netherlands (see answer to question 2 of this format). Emissions are being controlled under existing regulations.
Sweden	Yes	The Swedish legislation for pre-treatment of e-waste requires separation of plastics containing brominated flame-retardants. Methods currently used in Swedish recycling industry for discerning and separating BFR-containing plastics from other plastics are: <ul style="list-style-type: none"> <li>• written instructions/guidelines for the operators at the pre-treatment plant,</li> <li>• work experience; a person with a formal training and experience of manually sorting WEEE plastics/parts containing BFR, will carry</li> </ul>

Country	Screening and separation techniques for wastes containing brominated diphenyl ethers	Remarks
		<p>out the sorting process and remove plastic parts that according to his experience contain BFRs.</p> <ul style="list-style-type: none"> <li>• density separation; Different thermoplastics (containing BFR for example) can be separated by using water with different salinity (density).</li> <li>• furthermore, some of the recycling companies claim to have regular checking of the accuracy of their methods by X-ray fluorescence (XRF, handheld tool).</li> </ul> <p>The methods above do not distinguish between plastics containing PBDEs from plastics containing other BFRs.</p>
Switzerland	Yes	<p>Electric and electronic waste are treated in special plants. Big equipment or equipment containing certain hazardous compounds such as LCD displays containing mercury are dismantled manually. Printed boards and other metal enriched parts are further processed in metal recycling plants. Plastic parts are incinerated (incineration temperature approx. 800-900°C) or introduced into the automated process. The waste not being dismantled manually goes through an automated waste separation process. The waste is reduced to small scraps and separated according to the metal content (based for example on density separation). Metal enriched fractions are further processed in metal recycling plants, there the BDEs are destroyed during the melting process. The fractions mainly composed of organic materials are either incinerated or further separated according to the halogenated compounds content (for example through float sink separation or X-ray detection of bromine (XRF)). Halogenated enriched fractions are incinerated the rest of fractions are recycled. The technical standards for the electric and electronic waste treatment plants are set by a committee composed of different actors from the industrial and public sector as well as independent consultants.</p>
United States	No	<p>Discarded BDE articles are disposed primarily in MSW landfills, which have liners and leachate collection and treatment, and which the US considers to be ESM.</p>

**Question 6. Implementation of measures to ensure that recycling and final disposal of articles containing brominated diphenyl ethers are carried out in an environmentally sound manner**

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Remarks
Bulgaria	No	No	<p>No study has been conducted to find out, if PBDE contaminated products are found out in recycling processes and thus enter into newly formed products.</p> <p>There is no “screening technique” for PBDE in the waste stream. The establishment of concentration limits for c-pentaPDE and c-octaBDE in the waste stream is currently under preparation and discussion (forthcoming amendment of Annexes IV and V of Regulation (EC) No. 850/2004 on POPs).</p> <p>No analysis of c-pentaBDE or c-octaBDE content in waste plastic fractions from WEEE and ELV have been performed in Bulgaria, but it is assumed that their content is comparable with that identified in Europe. Thus carry-over into recycled plastics is unlikely.</p>
Canada	In progress	In progress	<p>The environmentally sound disposal, including recycling, storage, handling and export of waste material containing BDEs will be addressed by the Basel Convention’s new technical guidelines on the ESM of wastes containing BDEs. Currently there is a lack of information on environmentally sound disposal and recycling operations for BDEs. As Chair of the Small Intersessional Working Group (SIWG) under the Basel Convention, Canada is actively involved in the technical work related to POPs guidance. We are also leading the work to update and develop the following technical guidelines:</p> <ol style="list-style-type: none"> <li>1. Updating the General technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants.; and</li> <li>2. Development of the Technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride.</li> </ol>
Germany	Yes	Yes	<p>Germany has conducted a study on the existence of PFOS and PBDE in products and recycling processes/loop. The study was also intended to find out if PBDE contaminated products find have a way in recycling processes and thus enter into newly formed products. No cases of material recycling were found, where potentially PBDE containing material could enter into newly formed products. Thus carry-over into recycled plastics is unlikely.</p> <p>Treatment for final disposal of PBDE containing material is regulated in the German DepV, incineration plants have to be approved according to 17. BImSchV (Verordnung über die Verbrennung und die Mitverbrennung von Abfällen – 17th Federal Immission Control Ordinance, Ordinance on incineration and co-incineration of wastes). This ordinance places certain demands on the operation of an incineration plant, such as preparations against harmful environmental impacts</p>

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Remarks
			<p>through air pollution and control of fire hazards. It also contains limit values for emissions of amongst others TOC, PCDD/F, gaseous inorganic chlorinated or fluorinated compounds and mercury. These limits are based on BAT/BEP measures.</p> <p>References:</p> <p>Zangl, S., Blepp, M., Marquardt, M., Mochl, K., Wirth, O. (2012): Nationale Umsetzung des Stockholmer Übereinkommens zu persistenten organischen Schadstoffen (POPs) – PBDE und PFOS in Erzeugnissen und im Recyclingkreislauf. Umweltforschungsplan des Bundesministeriums für Umwelt, Naturschutz und Reaktorsicherheit Förderkennzeichen (UFOPLAN) 3710 63 415</p> <p>Zangl, S., Blepp, M., Marquardt, M., Mochl, K., Wirth, O. (2012): National-level implementation of the Stockholm Convention on persistent organic pollutants (POPs) – PBDE and PFOS in products and in the recycling loops (Summary report). Umweltforschungsplan des Bundesministeriums für Umwelt, Naturschutz und Reaktorsicherheit Förderkennzeichen (UFOPLAN) 3710 63 415</p>
Mexico	In progress	In progress	Mexico has developed a series of activities to conduct a needs assessment to provide training courses and guidance materials to incorporate environmental sound management in small and medium enterprises dedicated to the recycling and refurbishment of electronic waste.
Monaco	No	No	Not applicable in Monaco.
The Netherlands	Yes	Yes	<ol style="list-style-type: none"> <li>1. For waste streams see answers to questions 1 and 2 of this format.</li> <li>2. Recycling takes place conform the principles of environmental sound waste management. For recycling a permit is needed.</li> <li>3. Considerable part of the waste is incinerated. This is also licensed and emissions are controlled.</li> <li>4. There is no landfill to POP containing waste.</li> </ol> <p>Information from the literature and from the flame retardant branche indicated that octaBDE can be mainly found in electric and electronic equipment and pentaBDE in vehicles in the Netherlands. The study conducted by the Netherlands indicated that the concentrations to be expected through application of commercial octa- and pentaBDE (percentage range) can be found in only a limited number of occasions. There was a limited number of vehicles identified in which the observed concentrations indicated that commercial pentaBDE was applied. Concentrations of the sum POP/BDEs showed to be lower than 100 ug /g (&lt;0.01%) in recycle. Amounts in new articles, some of which are made from reczclate, contained negligible amounts of POPs-BDEs. A considerable amount of ELV and WEEE plastic waste is incinerated and thus eliminated in an environmentally sound manner. The Netherlands are also among the European countries with the highest percentage of municipal waste being incinerated. (<a href="http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-32-">http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-32-</a></p>

Country	Hexabromodiphenyl ether and heptabromodiphenyl ether	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Remarks
			10-238/EN/KS-32-10-283-EN.PDF)
Sweden	Yes	Yes	There is a ban on the landfilling of organic waste in Sweden and therefore landfilling of material containing POPs is uncommon. The most common treatment for POPs containing waste is incineration. There is no known recycling of waste containing POPs in Sweden. Sweden has ongoing screening studies of the leachate from landfills. As part of further activities described in chapter 3 of the Swedish national implementation plan, a study of Swedish incineration capacity will be performed.
Switzerland	Yes	Yes	<p>In Switzerland plastic fractions from waste streams originating from electrical and electronic wastes are either incinerated or recycled. The part that is recycled is separated according to the halogenated compounds content (for example through float sink separation or X-ray detection of bromine). Halogenated enriched Fractions are incinerated the rest of fractions are recycled. The bromine content of the produced recycled raw material is controlled. In the domain of end of life vehicles the light fractions originating from car shredding are further processed to recover metals, the rest is incinerated (even the mineral part) or exported to some EU countries. Mineral fractions resulting from car shredding cannot be landfilled or recycled in Switzerland because they have to comply with standards:</p> <ul style="list-style-type: none"> <li>• Landfillable waste should not contain &gt; 5% TOC there are also restrictions concerning certain hazardous compounds (see technical ordinance on waste SR8 14.600)</li> <li>• The standards for materials that can be used in roads, cement works or as stabilizing material for terrains... are even stricter (See guidance 011 excavated materials: <a href="http://www.bafu.admin.ch/publikationen/publikation/Oo446/index.html?lang=de">http://www.bafu.admin.ch/publikationen/publikation/Oo446/index.html?lang=de</a>)</li> </ul> <p>Light fractions originating from car shredding that are exported to EU countries are dealt with according to directive 2000/53/EC of the European parliament and of the council of 18 September 2000 on end-of life vehicles.</p>
United States	-	-	Final disposal of BDE articles occurs primarily in MSW landfills, which have liners and leachate collection and treatment, and which the US considers to be ESM. The products created by recycling activities are subject to the restrictions on BDE use described in the reply to question XXX above.

**Question 7. Information on any practical issues and/or experiences in implementing any of the recommendations in the annex to decision POPRC-6/2 or any other actions**

Country	Information on any practical issues and/or experiences in implementing any of the recommendations in the annex to decision POPRC-6/2 or any other actions
Bulgaria	<p>Bulgaria has not conducted a study on the existence of PBDE in products and recycling processes/loop. Only preliminary desktop investigation to evaluate the potential status on PBDE regulated under the Stockholm Convention. This status is as follows:</p> <ul style="list-style-type: none"> <li>- PBDE containing material is expected mainly to be present in EEE category 3 and 4 and cars, produced before 2000;</li> <li>- Taken the mean life of a car of more than 15 - 20 years in Bulgaria and the latest possible usage of PBDE as flame retardant in cars as the year 2000, this leads to 2015 - 2020 as the date where the majority of possibly PBDE containing cars will be decommissioned;</li> </ul> <p>EEE has mean life of 10-12 years and July 2006 is the latest date where products containing PBDE as flame retardants could be placed on the market in Bulgaria. Thus 2016 – 2018 is the date where the majority of PBDE containing EEE will be WEEE and as a result will be treated in the above described ways of waste treatments;</p>
Canada	<p>Canada has experienced challenges in trying to follow the life cycle of chemicals, including BDEs, in products or articles, particularly at the recycling and disposal stages. It can be very difficult to identify which products contain BDEs, particularly in imported products. This makes it more difficult to follow the substance through its life cycle to its end of life management, and potential release to the environment. As a result, Canada has considered a sector approach where the activities at waste management and recycling facilities are studied to ensure they are well understood, and that best management practices are identified that prevent or minimize releases of any toxic substance from these facilities. This information would complement other Canadian work being undertaken to fill the information gaps to allow a substance to be followed through its life cycle to end of life management.</p>
Germany	<p>Germany has conducted a study on the existence of PFOS and PBDE in products and recycling processes/loop. Objective of this study has been to evaluate the status quo on PBDE regulated under the Stockholm Convention. This status is as follows:</p> <ul style="list-style-type: none"> <li>- PBDE containing material is mainly present in EEE and cars;</li> <li>- Taken the mean life of a car of about 15 years and the latest possible usage of PBDE as flame retardant in cars as the year 2000, this leads to 2015 as the date where the majority of possibly PBDE containing cars will be decommissioned. Due to the “green car incentive” in Germany, that was run in 2009 and 2010 and required cars to be at least 9 years old, the date where the majority of possibly PBDE containing cars will be decommissioned is very likely to be earlier;</li> <li>- EEE has a mean life of 10 years and 2004 is the latest date where products containing PBDE as flame retardants could be placed on the market. Thus 2014 is the date where the majority of PBDE containing EEE will be WEEE and as a result will be treated in the above described ways of waste treatments;</li> </ul> <p>Consequently the regulations in Germany on waste containing PBDE are in place and do not need to be tightened.</p>
Mexico	<p>The activities in progress regarding the annex to decision POPRC-6/2 include the development of a needs assessment on available techniques and environmental practices for the recycling of articles containing PBDE; a Life Cycle Analysis of possible health and environmental impacts of recycling products as computers that may contain PBDEs; and a project to gather information on the potential trade volume of electronics (as computers) containing PBDE, including the stream from developed to developing countries.</p>
Monaco	<p>Not applicable in Monaco.</p>
The Netherlands	<p>The annex to decision POPRC-6/2 indicates a paucity of data on recycled POP-BDEs in rebonded foam carpet cushion and toys. Both items were measured in the study conducted in the Netherlands and other items that contained recycleate were measured as well. The measurement data, included in the annex to the report of that study, indicate that the amounts of POP-BDEs in these items are negligible. Highest concentrations measured were 11 and 16 ug/g for BDE-196 and BDE-197 in a toy pistol. Concentrations in all other items were much lower, most of which below the LOD. Although the measurements give an indication of what to expect, the</p>

Country	Information on any practical issues and/or experiences in implementing any of the recommendations in the annex to decision POPRC-6/2 or any other actions
	amount of samples taken are too limited to generalise among all carpets and all toys.
Sweden	<p>Long-term recommendation:</p> <p>The manufacturing sites where PBDE may have been a component in production are to a large extent identified in the regular inventory of contaminated sites performed in Sweden. There are also a couple of research or screening projects on-going in the country in order to quantify and manage the problems with leakage of POP:s from contaminated sites and landfills to the environment.</p>
Switzerland	<p>The content of hazardous compounds (including BDEs) of the different waste fractions in electric and electronic waste treatment plants are controlled but not on a regular base. The sampling and determination of the levels of the hazardous compounds are laborious and need operators who are experienced in this matter.</p> <p>Waste fractions mainly composed of organic material that are destined to recycling are separated according to the halogenated compound content (some companies manage separations according to the brominated compound content). A further separation of the waste fraction according to the BDEs content is not practicable.</p>
United States	EPA anticipates difficulties in implementation concerning the identification of imported articles that contain PBDEs.

## Question 8. Measures to prevent the export of articles from recycling pursuant to Part IV and/or Part V, 1b of Annex A

Country	Taken any measures to prevent the export of articles from recycling pursuant to Part IV and/or Part V, 1b of Annex A	Remarks
Bulgaria	Yes	Regulation (EC) 689/2008 on export and import of hazardous chemicals bans or severely restricts the export of the hazardous POPs chemicals besides for environmentally sound disposal. See 6.
Canada	No	<p>The Basel Convention currently allows the export of wastes containing BDEs for disposal including recycling operations. The Basel SIWG on POPs has developed a draft assessment of ten new POPs added to the Stockholm Convention since 2008 and how they are covered under the Basel Convention. This draft assessment will be reviewed by Basel Parties at their next meeting of the Open-Ended-Working Group in September 2012.</p> <p>The proposed assessment suggests that wastes containing BDEs would be captured by the Basel Convention by entry A3180: Wastes, substances and articles containing, consisting of or contaminated with polychlorinated biphenyl (PCB), polychlorinated terphenyl (PCT), polychlorinated naphthalene (PCN) or polybrominated biphenyl (PBB), or any other polybrominated analogues of these compounds, at a concentration level of 50 mg/kg or more. To that effect, a threshold of 50 mg/kg would be applied to wastes containing BDEs and would trigger the Basel Convention obligations for their export or import.</p> <p>In addition, the new technical guidelines to be developed by the Basel Convention on the ESM of wastes containing BDEs will provide guidance to Parties on what disposal operations are considered ESM.</p>
Germany	No	As stated under 6. Germany has conducted a study that found out, that no cases of material recycling were found, where potentially PBDE containing material could enter into newly formed products. Thus carry-over into products /articles from recycled materials that may contain PBDE is unlikely. Thus no measures are needed.
Mexico	Yes	Mexico is signatory to the Rotterdam Convention in which PentaBDE and OctaBde commercial mixtures are subject to export restrictions. Mexico is also signatory of the Basel Convention in which the transboundary movement of hazardous waste is restricted.
Monaco	No	Not applicable in Monaco.
The Netherlands	Yes	Commercial penta- and octaBDE are both incorporated in annex III of the Rotterdam Convention. Prior consent procedure is applied to export of articles containing these substances. Thus no measures are needed.
Sweden	Yes	<p>Recycling of plastics containing brominated flame retardants is not performed in Sweden and there is currently no demand for this kind of plastics by Swedish industry. The Swedish Recycling Industries' Association has made a statement that BFR-containing plastics must be phased out and not recycled.</p> <p>There is a ban on export to non-OECD countries through The Regulation on the Shipment of Waste (1013/2006/EC). This Regulation translates the provisions of the Basel Convention into European legislation. Exports to third countries of waste intended for disposal are prohibited, except to EFTA (European Free Trade Association) countries. Exports of hazardous waste intended for recovery are prohibited, except those directed to OECD countries and to third countries which are party to the Basel Convention.</p>

Country	Taken any measures to prevent the export of articles from recycling pursuant to Part IV and/or Part V, 1b of Annex A	Remarks
Switzerland	Yes	<p>Electric and electronic device suppliers have to take back the devices brought back by users. The suppliers have to ensure that the devices are disposed of in an environmental sound manner if they no longer use them. In Switzerland the export of electric and electronic waste (such as used electronic devices) falls in the category of “other controlled waste“ (see Ordinance on lists for movement of waste (SR 814.610.1)) and is dealt with in an analogous way as hazardous waste i.e. it falls in the scope of the Basel Convention and can only be exported to OECD countries for environmentally sound disposal. In general, the export of second hand good is controlled by Customs. The guidance “Exporting consumer goods — Second-hand articles or waste?“ is applied to decided whether export goods fall in the category of waste or second hand goods ex: • the degree of damage of cars is evaluated and above a certain score these cars are considered waste and fall in the scope of the Basel Convention. • In order to be considered as second hand good electric and electronic device must comply with a number of criteria such as they should not contain banned chemicals</p> <p>See: <a href="http://www.bafu.admin.ch/publikationen/publikation/0_161_3/index.html?lang=en">http://www.bafu.admin.ch/publikationen/publikation/0_161_3/index.html?lang=en</a></p>
United States	-	-

**PART II: Work programme on perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride****Question 9. Implementation of risk reduction measures for PFOS, its salts and PFOSF taking into account the recommendations in the annex to decision POPRC-6/2**

Country	(a) Production and industrial uses
Bulgaria	<p>Bulgaria has conducted a preliminary desktop investigation on the existence of PFOS, its salts and PFOSF in products or articles put on the market and recycling processes/loop within 202 companies questioned from different industrial sectors. The objective of this investigation has been to gather preliminary information and data on the use of and amounts of PFOS in industrial processes; consumer products containing PFOS put in the market; recycling of waste containing PFOS.</p> <p>PFOS is not produced in Bulgaria.</p> <p>No articles, containing PFOS, were identified on the market in the period 2000 – 2010.</p> <p>In 1991 in the country 12 tones of fire fighting foam FC 600 ATC, containing 6% PFOS were imported from third country. For the period 2000 -2010 no import of PFOS compounds or mixtures, containing PFOS was registered in the country.</p> <p>PFOS is allowed for specific exemptions uses in products or articles in concentration less than 0,1% by mass, according to Annex B Part I of the Convention. There is no indication that any product placed on the marked contains PFOS above the limit set out in Annex 1 Part A of EC Regulation 850/2004.</p>
Canada	<p>The PFOS, its Salts and Certain Other Compounds Regulations came into force in May 2008. They prohibit the manufacture, import, use, sale and offer for sale of PFOS and PFOS containing products with a limited number of exemptions. Two of these exemptions are time-limited and will expire in May 2013. This includes exemptions for the use of PFOS-based aqueous film forming foams and PFOS-based fume suppressant.</p> <p>PFOS sampling of rivers, lakes and fish is conducted under the Environment Canada CMP Monitoring and Surveillance Group, typically in urban areas, but not necessarily in industrial use areas or close to landfills. Results for air, sediment, water, fish and wildlife are available, with both a geographic analysis of recent (2007-2009) PFOS concentrations across Canada, and an analysis of PFOS levels in Canada over time (1979-2009). Monitoring results for landfill and wastewater from 2008 to 2010 are also available. Please refer to Annex 4 of this document.</p> <p>There are no Canadian examples of industrial activity directly contributing to contamination of land resulting from the application of biosolids containing PFOS. Environment Canada's CMP program has detected concentrations of PFOS in landfill leachate, wastewater and treated biosolids.</p> <p>A Biosolids Task Group (BTG) has been established by the Canadian Council of Ministers of the Environment (CCME) and is developing a Canada-wide approach for the management of wastewater biosolids focusing on policy and regulatory harmonization. This approach promotes the beneficial use of biosolids application and does not consider potential PFOS contamination.</p>
Germany	<p>PFOS is still produced in Germany, information on tonnages has to take into account the production of H4PFOS.</p> <p>German producers only sell PFOS for the remaining legal uses in electroplating (&gt;95%) and in foto industry (&lt; 5%) in Europe. Other producers include various Chinese companies.</p> <p>PFOS is used as a component in polymer production, and may be released in degradation processes.</p> <p>There is no indication that any product placed on the marked contains PFOS above the limit set out in Annex 1 Part A of EC Regulation 850/2004.</p>
Mexico	Not available
Monaco	Not applicable in Monaco.
The Netherlands	An inventory study on the use of PFOS in the Netherlands was conducted in the first half of 2013. The aim of the study was to determine the amount of PFOS used in the Netherlands per allowed type of use, the developments regarding the replacement of PFOS and the situation regarding the prohibited use of PFOS containing fire-

Country	(a) Production and industrial uses
	fighting foam. No production takes place in the Netherlands.
United States	The PFAS Significant New Use Rule (SNUR) (67 December 9, 2002 72854) still requires review of all uses not exempted. In addition, article content is being addressed in future rule makings.
Sweden	There is no production of PFOS in Sweden. The remaining use in hard metal plating industries is in accordance with BAT/BEP. The use is not in closed loop systems. This remaining use will be phased out according to adopted EU-legislation. Resulting sludge is deposited in landfills specialized for hazardous waste.
Switzerland	There is no PFOS production in Switzerland. The only closed industrial processes that still need PFOS are: photoresists or anti-reflective coatings for photolithography processes and photographic coatings applied to films, papers, or printing plates. In the domain of hard metal plating, closed loop process is the only process where the use of PFOS is continued to be allowed and only for chromium hard metal plating. The other types of metal plating have until August 2015 to stop the use of PFOS (see annex 1.16 of Ordinance on risk reduction related to the use of certain particularly dangerous substances, preparations and articles (SR 814.81))

Country	(b) Uses including uses in open applications <sup>2</sup>
Bulgaria	No uses of PFOS in products and articles have been identified as a result of a study in approx. 200 companies from different economic sectors (carpet, textiles and upholstery, leather and apparel, rubber and plastics, metal plating (hard metal plating), metal plating (decorative plating) and others.
Canada	The PFOS, its Salts and Certain Other Compounds Regulations came into force in May 2008. They prohibit the manufacture, import, use, sale and offer for sale of PFOS and PFOS containing products with a limited number of exemptions. Two of these exemptions are time-limited and will expire in May 2013. This includes exemptions for the use of PFOS-based aqueous film forming foams and PFOS-based fume suppressant.
Germany	Germany has conducted a study on the existence of PFOS and PBDE in products and recycling processes/loop. Results of the study: Metal plating industry: <ul style="list-style-type: none"> <li>- Estimated yearly use of PFOS in the metal plating industry in Germany about 3,400 kg;</li> <li>- Of this used amount about 3,187 kg enter into the waste stream, that is then treated in different ways and in most cases ends up in thermal treatment where PFOS is decomposed;</li> <li>- The rest (about 207 kg) enters into the waste water system, that is treated in waste-water-treatment-plants;</li> <li>- Right now limited possibility to completely abandon the use of PFOS, however there are several incentives to reduce the use of PFOS and its entry into the waste water system</li> </ul> Fire fighting foams: <ul style="list-style-type: none"> <li>- EU Directive 2006/122/EG has prohibited the placing on the marked and usage of PFOS containing fire fighting foams since 27 June 2008, stocks had to be</li> </ul>

<sup>2</sup> Aviation hydraulic fluids, insecticides for control of red imported fire ants and termites, chemically driven oil production, carpets, textiles and upholstery, leather and apparel, electric and electronic parts for some colour printers and colour copy machines, paper and packaging, fire fighting foams, insect baits for control of leaf-cutting ants from *Atta spp.* and *Acromyrmex spp.*, coating and coating additives, rubber and plastics, metal plating (hard metal plating), metal plating (decorative plating) and others.

Country	(b) Uses including uses in open applications <sup>2</sup>
	<p>used up until 27 June 2011;</p> <ul style="list-style-type: none"> <li>- EC Regulation 850/2004 restricted the use of fire fighting foams containing PFOS that were placed on the market before 27 December 2006 until 27 June 2011;</li> <li>- Since then stocks have to be disposed of in an environmentally sound manner;</li> <li>- In 2010 about 3.5 – 46 t PFOS from 300 – 915 t fire fighting foams have been disposed of, in view of 2015 and 2030 there won't be any noteworthy PFOS emissions from fire-fighting foams;</li> <li>- However, in areas around airports there is a great probability of PFOS-contaminated soil, due to fire drills with PFOS containing foams.</li> </ul> <p>Photographic industry:</p> <ul style="list-style-type: none"> <li>- In 2010 no use of PFOS in the production of photographic material;</li> <li>- X-ray films and other material (e.g. negatives) that have been used in 2010 but were not produced in Germany, may still contain PFOS;</li> <li>- Estimated 75 kg PFOS from PFOS-containing photographic material that has been produced and used in 2010</li> <li>- About 381 kg PFOS in waste from photographic materials that were produced in 2000 (taking the mean life of photographic material of 10 years) ;</li> <li>- 201 kg photographic paper and other material as well as 78.8 kg X-Ray photographs ended up in thermal treatment as municipal waste in 2010;</li> <li>- Another 78.8 kg X-Ray photographs were recycled in 2010, where PFOS residues are either burnt or find their way into waste water.</li> </ul> <p>Aviation hydraulic fluids:</p> <ul style="list-style-type: none"> <li>- 95 % of the hydraulic fluids used are produced by ExxonMobile and Solutia, who state that PFOS is not used in their products anymore;</li> <li>- In 2010 between 33 and 67 kg PFOS have been used in the aviation industry, whereof 22 to 34 kg enter the waste stream;</li> <li>- PFOS emissions occurring in the future will be due to maintenance of hydraulic fluids;</li> <li>- The statements by ExxonMobile and Solutia need to be verified by analyses of hydraulic fluids;</li> <li>- High possibility that this exemption is no longer needed in Germany.</li> </ul> <p>Semiconductor Industry:</p> <ul style="list-style-type: none"> <li>- Use of PFOS in Germany about 1.87 kg/y, used in processing, not remaining in products;</li> <li>- Voluntary commitment to resign from PFOS-use in non-critical applications, yet no alternative for PFOS substitution in critical applications;</li> <li>- Emissions in 2010 about 0.082 kg, amount of PFOS that entered the waste stream in 2009 about 1.79 kg, which ends up in thermal treatment;</li> <li>- Contradictory information on development of alternatives: some sources say that there are no efforts made on finding a suitable alternative to PFOS, however other sources say that there is development of PFOS alternatives taking place, that are not yet feasible for commercial use;</li> </ul> <p>Leather industry:</p> <ul style="list-style-type: none"> <li>- In 2010 probably 37 kg PFOS from furniture-leather entered the waste stream;</li> <li>- Waste stream probably PFOS-free in 2017, assuming that no PFOS has been used for leather upholstery since 2002 and taking a mean life of 15 years;</li> <li>- Since 2005 thermal treatment of upholstery waste stream;</li> <li>- An estimated amount of 750 kg PFOS is present in waste dumps from leather upholstery that has been built until 1990 and disposed of in waste dumps until 2005;</li> </ul>

Country	(b) Uses including uses in open applications <sup>2</sup>
	<ul style="list-style-type: none"> <li>- Leather products imported to Germany need to be screened with regard to their PFOS-content.</li> </ul> <p>Carpet industry:</p> <ul style="list-style-type: none"> <li>- No use of PFOS since 2002;</li> <li>- About 83.4 t PFOS in the carpet-waste stream in 2009 (carpets that have been sold in 1995, average life 10-18 years, mean 14);</li> <li>- PFOS release into leak water of waste dumps by carpets manufactured before 1991;</li> <li>- Estimated amount of PFOS hidden in waste dump sites about 1,750 t</li> <li>- Compliance with the threshold value for carpets of 1 µg/m<sup>2</sup> needs to be checked.</li> </ul> <p>Paper and cellulose industry:</p> <ul style="list-style-type: none"> <li>- According to TEGEWA-association and VDP (association of German paper mills), PFOS has never been used for attaining water- and fat-repellent properties in food packaging;</li> <li>- Threshold value for PFOS in coated paper 1 µg/m<sup>2</sup> according to EU Regulation 850/2004, thus there is a possibility that PFOS enters into waste water from paper mills;</li> <li>- Release of PFOS-precursors possible, which degrade to PFOS in the environment, thus PFOS contamination of recycling paper is possible.</li> </ul> <p>Textile industry:</p> <ul style="list-style-type: none"> <li>- According to textile association (TEGEWA) there is no PFOS used in the production, due to change of the manufacturing method of fluorocarbon-resins (Fluorcarbonharz);</li> <li>- PFOA is formed increasingly as by-product (and can also be found in the finished products);</li> <li>- Analyses of working clothes have shown that the threshold value for PFOS in textiles of 1 µg/m<sup>2</sup> is not exceeded; however PFOA and shorter and longer chained PFCs appear in high concentrations (up to 37 µg/m<sup>2</sup> PFOA and 414 µg/m<sup>2</sup> PFBS).</li> </ul>
Mexico	Not available
Monaco	Not applicable in Monaco.
The Netherlands	<p><b>Metal plating industry; hard chroming and decorative chroming; open system or closed loop</b>            Use: wetting agents for use in controlled electroplating systems</p> <p><b>Metal plating industry; hard chroming; closed loop</b>            Use: Mist suppressants for non-decorative hard chromium (VI) plating in closed loop systems</p> <ul style="list-style-type: none"> <li>-The roughly estimated use of PFOS containing products is 145-150 kg. This is probably an overestimation, because the high volume reported by one respondent is included in the extrapolation. Furthermore, it is considered to be a worst-case estimation.</li> <li>- Compared to the other allowed type of uses, the volume of PFOS containing products is the highest in this industry.</li> <li>- Compared with a previous study on PFOS containing products, the use of PFOS seems to be reduced when comparing the worst-case estimations. However, this cannot be stated with certainty.</li> <li>- Exposure to Chromium III is less toxic to workers compared with Chromium VI. Therefore, from an occupational point of view, there is less need for PFOS. When a company switches from Chromium VI to Chromium III, this is often accompanied by abandoning the use of PFOS.</li> </ul>

Country	(b) Uses including uses in open applications <sup>2</sup>
	<p>- Respondents describe the concept of a “closed system” as one which has a minimalized exposure of the worker as a result of measurements like non recirculating ventilation. This is a different interpretation compared to the concept of a closed system in which there is absolutely no contact between PFOS and the environment.</p> <p>- Alternatives are on the market, but switching is not possible for all processes. This is due to both health and safety and quality requirements.</p> <p><b>Semi-conductor industry</b> Use: photo-resist or anti-reflecting coatings for photolithographic procedures</p> <ul style="list-style-type: none"> <li>- The use of PFOS is very low, in the range of a few kilograms.</li> <li>- Alternatives are on the market, but there are many different products. Therefore, the industry claims that more time is needed to develop a full range of qualitatively comparable alternatives.</li> </ul> <p><b>Photographic industry</b> Use: photographic coatings for films, paper or press plates</p> <ul style="list-style-type: none"> <li>- The reported use of PFOS is 0 kilograms. This is probably an underestimation, due to the low market coverage within this industry</li> <li>- This industry consists of many small companies.</li> <li>- Within the industry, new techniques have been developed which do not require PFOS.</li> </ul> <p><b>Aviation industry</b> Use: hydraulic fluids for aviation</p> <ul style="list-style-type: none"> <li>- The reported use of PFOS is 0 kilograms</li> <li>- The mostly used product (Skydrol LD-4) does contain a PFOS related molecule (in an amount less than 0.1% ww), but this is not a listed chemical in part I of Annex B to the Stockholm Convention.</li> </ul> <p><b>Fire-fighting foam</b></p> <ul style="list-style-type: none"> <li>- The industry is well aware of the status of PFOS containing fire fighting foam. The use of PFOS containing fire fighting foam seems to be phased out.</li> </ul>
Sweden	<p>There are no remaining uses of PFOS in open applications.</p> <p>To globally support the use of alternatives to PFOS, Sweden has supported the development of a guidance set out in document UNEP/POPS/POPRC.6/13/Add.3/Rev.1.</p>
Switzerland	<p>In the domain of hard metal plating, closed loop process is the only process where the use of PFOS is continued to be allowed and only for chromium hard metal plating. The other types of metal plating have until August 2015 to stop the use of PFOS (see annex 1.16 of Ordinance on risk reduction related to the use of certain particularly dangerous substances, preparations and articles (SR 814.81)).</p>
United States	<p>The 2002, PFAS SNUR exempted several uses and the Agency has no information suggesting that they are not currently used, although progress toward finding alternatives is being made.</p> <ul style="list-style-type: none"> <li>• <b>Metal Plating:</b> Fume suppressant use in open chromic acid baths in chromium electroplating facilities. <ul style="list-style-type: none"> <li>○ EPA has been working with the chromium electroplating industry through the National Association for Surface Finishing (NASF) to address the uses of all long-chain perfluorinated chemicals, including PFOS and PFOSE, by assisting the electroplating sector in moving to safer alternatives for fume suppressant. Shorter chain PFC fume suppressants are available and in use throughout the world, particularly in Japan, Australia and the EU,</li> </ul> </li> </ul>

Country	(b) Uses including uses in open applications <sup>2</sup>
	<p>and EPA has been highlighting those uses in order to support a national phase-out. In addition to voluntary efforts, EPA proposed a regulatory phase-out of PFOS-based fume suppressants into the Clean Air Act's residual risk and technology review regulations for the chromium electroplating sector. This proposal covers approximately 1,450 facilities including hard chromium electroplating, decorative chromium electroplating, and chrome anodizing facilities.</p> <ul style="list-style-type: none"> <li>• <b>Fire Fighting Foam:</b> <ul style="list-style-type: none"> <li>○ There are continued uses of existing stocks of PFOS-based fire fighting foam in the U.S. According to a report from the AFFF Coalition published in 2011, calculations based on estimated use of the stock available when new production ceased at the end of 2002 indicate that current stocks would be approximately: <ul style="list-style-type: none"> <li>▪ Military – 1,094,700 gallons</li> <li>▪ Civil Aviation (ARFF) – 20,000 gallons</li> <li>▪ Oil Refineries – 152,000 gallons</li> <li>▪ Other Petro-Chem – 500,000 gallons</li> <li>▪ Civil Aviation – 70,300 gallons</li> <li>▪ Fire Departments – 60,000 gallons</li> <li>▪ Misc/Merchant Ship/Offshore- 75,000 gallons</li> </ul> </li> </ul> </li> <li>• <b>Semiconductor industry:</b> According to the Semiconductor Industry Association (SIA) and the Semiconductor Equipment and Materials, Inc. (SEMI) in the 2002 SNUR, PFAS needs to be used in the semiconductor industry to achieve the technical requirement of fineness of line refining sharp definition in the submicron area.</li> <li>• <b>Photographic in industry:</b> PFAS continues to be used as a surfactant in mixtures used to process imaging films which involves the incorporation of a PFAS material into a mixture that is used as a photoprocessing solution where its surfactant properties function to prevent discoloration of films while the films are being processed through the solution. This applies only to processing films. Use in large-scale research and development projects as a tracer.</li> </ul>

Country	(c) Existing stocks
Bulgaria	Approx. 8 tones fire fighting foam FC 600 ATC, containing 6% PFOS as waste was identified in Bulgaria. This amount shall be exported abroad for final incineration in 2012. No other waste, containing PFOS are identified in the country.
Canada	Existing stocks of PFOS have been identified for fire fighting foams only. Based on a use pattern survey published in January 2005, stockpiles of PFOS-based AFFF were estimated to be approximately 300 tonnes, representing 3 tonnes of PFOS, at that time. The PFOS, its Salts and Certain Other Compounds Regulations contain a time-limited exemption for the use of this PFOS-based AFFF that will expire in May 2013. Manufacture, import, sale and offer for sale of these PFOS-based AFFF is prohibited by the Regulations.
Germany	None Known
Mexico	Not available
Monaco	Not applicable in Monaco.

Country	(c) Existing stocks
United States	The AFFF Coalition has informed EPA that there are current existing PFOS stocks of fire fighting foam concentration. See above.
The Netherlands	None known
Sweden	There are no known stocks of PFOS in Sweden.
Switzerland	A stock of fire fighting foams still exist. It has to be disposed of by 2018 (see annex 1.16 of Ordinance on risk reduction related to the use of certain particularly dangerous substances, preparations and articles (SR 814.81)). PFOS containing fire fighting foams that become waste have to be labelled as hazardous waste destined to be incinerated.

Country	(d) PFOS, its salts and PFOSE in consumer products deposited in municipal landfills
Bulgaria	The maximum PFOS input into the waste stream is expected to come from old carpets that have been produced before 2000. Other sources were fire fighting foams and metal plating industry. For the future the input from fire-fighting foams will not be expected, since their use in Bulgaria is banned from 27 June 2011.
Canada	<p>The environmentally sound disposal, including recycling, storage, handling and export of waste material containing PFOS will be addressed by the Basel Convention new technical guidelines on the ESM of wastes containing PFOS. As Chair of the POPS SIWG, Canada is actively involved in the technical POPs work under the Basel Convention. We are also leading the updating and development of the following technical guidelines:</p> <ul style="list-style-type: none"> <li>• Updating the General technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants; and</li> <li>• Development of the Technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride.</li> </ul> <p>As mentioned for BDEs, PFOS is sampled as part of the Canadian Chemicals Management Plan (CMP) and has been sampled in leachate from 10-12 Canadian municipal solid waste landfills from 2008 to 2011. Canada has attached to its submission a summary of the data and a summary of treatment technologies for PFOS in leachate. This information will be useful to identify and assess disposal options which are environmentally sound for wastes containing PFOS. This Canadian data set, along with experience in gathering the data will also be shared with the Basel Convention Parties and its SIWG on POPs while preparing the new technical guidelines on the ESM of wastes containing PFOS.</p> <p>While storage requirements for material and articles identified to contain PFOS are not specifically covered under Canadian legislation, general waste storage requirements exist under various Canadian regulations including general waste management regulations and authorizations, and codes such as the material safety data sheet (MSDS) or the Canadian building codes. Also, the new technical guidelines to be developed by the Basel Convention on the ESM of wastes containing PFOS will provide storage guidance to Parties.</p> <p>PFOS sampling of rivers, lakes and fish is conducted under the Environment Canada CMP Monitoring and Surveillance Group, typically in urban areas, but not necessarily in industrial use areas or close to landfills. Results for air, sediment, water, fish and wildlife are available, with both a geographic analysis of recent (2007-2009) PFOS concentrations across Canada, and an analysis of PFOS levels in Canada over time (1979-2009). Monitoring results for landfill and wastewater from 2008 to 2010 are also available. Please refer to Annex 4 of this document.</p> <p>There are no Canadian examples of industrial activity directly contributing to contamination of land resulting from the application of biosolids containing PFOS. Environment Canada's CMP program has detected concentrations of PFOS in landfill leachate, wastewater and treated biosolids.</p>

Country	(d) PFOS, its salts and PFOSF in consumer products deposited in municipal landfills
	A Biosolids Task Group (BTG) has been established by the Canadian Council of Ministers of the Environment (CCME) and is developing a Canada-wide approach for the management of wastewater biosolids focusing on policy and regulatory harmonization. This approach promotes the beneficial use of biosolids application and does not consider potential PFOS contamination.
Germany	<p>The maximum PFOS input into the waste stream is expected to come from carpets that have been produced until 2002. Other sources were fire fighting foams and metal plating industry. For the future the input from fire-fighting foams will be negligible. There is a great possibility that there is a contamination of several landfills with PFOS, its salts and PFOSF, due to deposition untreated municipal wastes until 2005. Analyses of landfill leak water in North Rhine-Westphalia have shown that there is PFOS leaking out of landfills.</p> <p>According to the Landfill Ordinance (DepV), wastes mentioned in Annex V to the POPs Regulation that exceed the concentration limits for the substances listed in Annex IV to the Regulation may not be deposited at surface landfills (Section 7(1)(7) DepV).</p> <p>Also, due to the German DepV (Verordnung über Deponien und Langzeitlager – ordinance on waste disposal sites and long term storages) of 2009, that bans deposition of fractions containing wastes listed in Annex V, Part 2 of EC Regulation 850/2004, and allows a maximum TOC (total organic carbon) of <math>\leq 6\%</math> by weight (subsurface disposal), of <math>\leq 3\%</math> by weight (above ground disposal sites or non hazardous and hazardous wastes), and <math>\leq 1\%</math> by weight (above ground disposal sites for wastes) and earlier mechanisms like the TA Siedlungsabfall (technical instructions on municipal waste) of 1993, that allowed a maximum TOC of <math>\leq 1\%</math> by weight (above ground disposal sites for wastes) and <math>\leq 3\%</math> by weight (above ground disposal sites for wastes), municipal wastes and wastes with a high TOC in general are treated thermally. This thermal treatment leads to a destruction of possible PFOS content. Emissions can occur around shredder plants. Shredder fractions are either treated thermally or used for building disposal sites.</p>
Mexico	Not available
Monaco	Not applicable in Monaco.
The Netherlands	None known
Sweden	<p>There is a ban on landfilling of organic waste in Sweden. Waste carpets, furniture and textiles are most commonly incinerated in municipal waste incineration plants. The amounts of PFOS in the Swedish waste stream should be further investigated along with the study of Swedish incineration capacity as described in chapter 3 of the Swedish national implementation plan.</p> <p>There is a need to further improve the handling of waste containing PFOS.</p> <p>There is no known recycling of articles containing PFOS. On-going recycling of paper or packaging material is according to the industry not affected by materials containing PFOS.</p> <p>Capacity to handle and incinerate waste containing PFOS is available in Sweden as described above for PBDE.</p>
Switzerland	In December 1990 the obligation of incineration of household waste has been introduced with a transitional period of 9 years (see technical ordinance on waste SR8 14.600 of 10 December 1990 article 11 and 53a).
United States	<p>Some open literature suggests carpet treated with PFOS based product may still contain residual PFOS or precursors chemical years after application. For instance, General consumer products, like many other waste streams (e.g., pharmaceuticals, personal care products, etc.) are generally household waste streams exempted from RCRA Subtitle C hazardous waste laws and regulations. As a result, these materials are not tracked for PFOS/PFOSF as a specific category on a regular basis, nor are they regulated specifically. As a result, PFOS/PFOSF as a “consumer product”-specific issue is hard for an EPA to gauge, as PFOS/PFOSF findings arise out of leachate sampling and site investigations. Therefore, PFOS/PFOSF is usually found after the fact, as part of a landfill’s leachate monitoring strategy.</p> <p>Two of the major sources of PFOS/PFOSF to landfills involve: (1) excess biosolids/WWTP waste application to landfills post WWTP treatment as a landfill covering</p>

Country	(d) PFOS, its salts and PFOSF in consumer products deposited in municipal landfills
	or (2) general solid waste disposal as a sludge, solid, off-spec waste, or other liquid mixture. As PFOS/PFOSF is not listed by EPA as a hazardous waste, PFOS/PFOSF can be land applied in any State-permitted or licensed RCRA Subtitle D solid waste landfill. As a result, each State monitors PFOS/PFOSF as their permits dictate. Currently, only some states monitor for PFOS/PFOSF in leachate, and some States monitor for these chemicals (and others) in different ways based on a multitude of factors.

Country	(e) Contaminated sites
Bulgaria	Unknown.
Canada	The Government of Canada has committed \$3.5B in 2005 through the Federal Contaminated Sites Action Plan (FCSAP) to address contaminated sites for which it is responsible. The administration and delivery of this program includes the provision of technical advice and scientific expertise to the custodians on the management of contaminated sites.
Germany	There have been attempts to clean up contaminated sites in North Rhine-Westphalia. Contaminated sites are expected to be around airports (due to use of fluorinated fire fighting foams) and landfills that have been filled with untreated municipal waste until 2005.
Mexico	-
Monaco	Not applicable in Monaco.
The Netherlands	A few sites are known and measures are being taken to remediate these sites within the soil policy framework.
Sweden	Sites where manufacturing and use of POPs e.g. the sites where fire extinguishers have been used causing contamination of PFOS are to a large extent identified in the regular inventory of contaminated sites performed in Sweden. These sites are thereby also covered by the Swedish program for the remediation of contaminated sites.
Switzerland	No known PFOS contaminated sites in Switzerland.
United States	Multiple sites in Michigan, Minnesota and Ohio are contaminated with PFOS, PFOSF and/or a number of other long-chain perfluorinated chemicals. Additionally, there are sites in other States where PFOS/PFOSF contamination has been identified. As a result, EPA is building capacity to address PFOS/PFOSF contamination at both operating and abandoned sites in the future, as more site contamination reports are expected.

Country	(f) Information on any practical issues and/or experiences in implementing any of the recommendations. If possible, please indicate according to the timeframes (short-term, medium-term, or long term) discussed in the recommendations in the annex to decision POPRC-6/2
Bulgaria	The European Union, as a party to the Stockholm Convention, has registered for a specific exemption for use related to PFOS and its derivatives, regulated under the convention. Thus Bulgaria, as a member of the European Union, is registered, too. Due to Regulation (EC) 850/2004 the use of fire fighting foams containing PFOS is prohibited since 27 June 2011. Waste containing PFOS is either declared as hazardous wastes and enters into special treatments or is municipal waste that is treated thermally. In both cases PFOS is destroyed.

Country	(f) Information on any practical issues and/or experiences in implementing any of the recommendations. If possible, please indicate according to the timeframes (short-term, medium-term, or long term) discussed in the recommendations in the annex to decision POPRC-6/2
	<p>In the preliminary investigation no recycling products that may contain PFOS have been declared. However, this does not indicate that products from recycled material are PFOS free, since PFOS content is allowed up to a certain threshold value set out in Annex I Part A of Regulation (EC) 850/2004.</p> <p>There is no “screening technique” used for PFOS in the waste stream in Bulgaria. The establishment of concentration limits for c-pentaPDE and c-octaBDE in the waste stream is currently under preparation and discussion (forthcoming amendment of Annexes IV and V of Regulation (EC) No. 850/2004 on POPs).</p> <p>No analysis of PFOS content in waste materials have been performed in Bulgaria, but it is assumed that their content is comparable with that identified in Europe.</p>
Canada	<p>Canada has experienced challenges in trying to follow the life cycle of chemicals, including PFOS, in products or articles, particularly at the recycling and disposal stage. It can be very difficult to identify which products contain PFOS, particularly in imported products. This makes it more difficult to follow the substance through its life cycle to its end of life management, and potential release to the environment. As a result, Canada has considered a sector approach where the activities at waste management and recycling facilities are studied to ensure they are well understood, and that best management practices are identified that prevent or minimize releases of any toxic substance from these facilities. This information would complement other Canadian work being undertaken to fill the information gaps to allow a substance to be followed through its life cycle to end of life management.</p>
Germany	<p>Due to Regulation (EC) 850/2004 the use of fire fighting foams containing PFOS is prohibited since 27 June 2011. This exemption is no longer needed in Germany. According to industry associations there is no use of PFOS in carpets, leather, textiles, upholstery, paper, and packaging anymore. There is a great chance that the exemption for hydraulic fluids in aviation industry is no longer needed. Waste containing PFOS is either declared as hazardous wastes and enters into special treatments or is municipal waste that is treated thermally. In both cases PFOS is destroyed. In the study conducted no ways of recycling products that may contain PFOS have been found. However, this does not indicate that products from recycled material are PFOS free, since PFOS content is allowed up to a certain threshold value set out in Annex I Part A of Regulation (EC) 850/2004.</p>
Mexico	Not available
Monaco	Not applicable in Monaco.
The Netherlands	<p><b>Metal plating industry</b> Suppliers do offer PFOs-free products. However, according to users, not all processes are suitable for the use of PFOS-free mist suppressant/wetting agents. Main reason is the reduced quality of chrome plating with PFOS-free products. Another reason is that the reduction of surface tension by alternatives is lower and could therefore lead to higher exposure to chromium (VI) for the worker.</p> <p><b>Semi-conductor industry</b> Within this industry, every product has its own specific application. Therefore, for every product, a PFOS-free alternative has to be developed. The industry, together with suppliers, is working on PFOS-free solutions, but it also claims that it needs more time to develop qualitatively comparable PFOS-free alternatives.</p> <p><b>Aviation industry</b> According to a producer, PFOS is not an ingredient of the hydraulic fluid. The product contains a PFOS related molecule (a perfluoroalkyl sulphonate), in an amount lower than 0.1 % w/w. This ingredient is not indicated on the Material Safety Data Sheet and the producer stated that the substitute molecule was not listed in part I of Annex B to the Stockholm Convention and PFOS related chemicals. Despite extensive research, no substitutes for perfluoroalkyl sulphonates (PFOS related molecule) have been identified yet. The use of PFOS in hydraulic fluids seems to be outdated.</p> <p><b>Fire-fighting foam</b> Many regulators and authorities require tests or practice with fire-fighting foam installations. On an industrial scale, this requires huge amounts of foam to be spent and spilled into the environment. Not only PFOS-containing foams but also non-PFOS containing foams based on other fluoro compounds damage the environment.</p>

Country	(f) Information on any practical issues and/or experiences in implementing any of the recommendations. If possible, please indicate according to the timeframes (short-term, medium-term, or long term) discussed in the recommendations in the annex to decision POPRC-6/2
	Various suppliers of fire-fighting foams advertise “practice” or “test” foams with environmentally less hayardous ingredients.
Sweden	There are a couple of research or screening projects going on in the country in order to quantify and manage the problems with leakage of POP:s from contaminated sites and landfills to the environment.
United States	There have been a number of PFOS free photo resistant/microelectronic lithography successes reporting in the open literature and to EPA by companies or trade associations. In addition, articles being imported into the United States with PFOS are a major issue for the EPA.

## Submission by a letter

Country	Summary of the information
Argentina	BDEs are not reported to be produced, imported, exported, used or present in products, by the chambers of industry for electronics, lighting equipment, telecommunications, and for chemicals and petrochemicals. The chamber of industry for plastics has reported limited use of BDEs for the manufacture of flame retardant masterbatches and that the substitution of BDEs is being considered.
Guatemala	No information.
Kiribati	No information.
Latvia	No information.
Nigeria	<p>As a preliminary step in the implementation of the work programme, Nigeria conducted a life-cycle survey on e-waste management which revealed that every month, an average of 500 containers of electronic products enter the country through Lagos SeaPort, out of which 70% contain non functional computers, computer peripherals, televisions, VCRs, DVD Players, stereo equipment, cell phones etc.</p> <p>In addressing challenges posed by the foregoing, Nigeria has implemented the following interventional actions:</p> <ul style="list-style-type: none"> <li>• Networking and collaborating with relevant national stakeholders and international organisations on sound management of e-waste;</li> <li>• Draft National Policy on e-waste;</li> <li>• Development of Regulations for the Electrical/Electronic Sector to control pollution from all operations and ancillary activities on the Nigerian Environment and cover both new and used Electrical/Electronic Equipment (EEE/UEEE). The regulations are based on 'cradle to cradle' approach to electrical/electronic products management. Contents of the Regulations include the following: <ul style="list-style-type: none"> <li>- the principles of 5Rs which are: Reduce, Repair, Re-use, Recover and Recycle as</li> <li>- the primary drivers of the sector;</li> <li>- best Practices in the manufacture of Electrical/Electronic Equipment (EEE);</li> <li>- guidelines for Importation of Used EEE;</li> <li>- the Polluter Pays Principle;</li> <li>- practice of Environmentally Sound Management (ESM);</li> <li>- the Extended Producer Responsibility; and</li> <li>- responsibilities and roles of stakeholders.</li> </ul> </li> <li>• The Government is presently discussing with some Original Equipment Manufacturers (OEM) like HP, Dell, Nokia and Philips towards establishing a collection/take back system under the Extended Producers' Responsibility Program (EPR) ;</li> <li>• Capacity building of regulatory officers, including Customs, Standards Organization of Nigeria (SON) etc., for effective import and export control;</li> <li>• Registration and awareness raising programmes for Importers ofEEE;</li> <li>• Regulations being developed on the management of EL Vs, particularly for: <ul style="list-style-type: none"> <li>- sound management ofBDE-containing components;</li> <li>- import control;</li> <li>- database management, including deregistration;</li> </ul> </li> </ul>

Country	Summary of the information
	<ul style="list-style-type: none"> <li>- Guidelines for Importation of motor vehicles;</li> <li>- the Polluter Pays Principle;</li> <li>- practice of Environmentally Sound Management (ESM);</li> <li>- the Extended Producer Responsibility; and</li> <li>- responsibilities and roles of stakeholders;</li> <li>- capacity building of sectoral regulatory bodies, including Customs, Road Safety Corps for effective import and export control;</li> <li>- licensing of ELV management facilities.</li> </ul> <p>• National capacity building for POPs assessment/analyses, for example, establishment of the Global Environmental Outlook Research Center (GRC) Reference Laboratory in Ibadan, Nigeria.</p> <p>During the new POPs initial assessment project implementation, a remarkable use of Aqueous Fire Fighting Foam (AFFF) containing PFOS for fire-fighting was observed in the Oil Sector. The pilot survey report also suggested the likelihood of open applications in aviation and pest control e.g. aviation hydraulic fluids, insect baits among others. Subsequently, PFOS has been identified as a priority issue in the ongoing National Implementation Plan (NIP) review and update process.</p> <p>Furthermore, alternatives to PFOS-containing pesticides are being promoted by the Government in collaboration with pesticide merchants like Croplife Nigeria. Consequently, PFOS alternatives such as pyrethroid pesticides like deltamethrin, cypermethrin etc. are readily available and affordable in Nigeria. Nigeria is not a manufacturer of (AFFF), hence in order to effectively reduce the risk associated with the use of PFOS-AFFF, technical and financial supports are required to establish a comprehensive PFOS inventory and build the National capacity for transition to the use of PFOS alternatives in fire fighting.</p>