



An EU funded project

Development of the Special waste stream plan SWSP for wastes containing POPs

3rd Workshop
23rd of February 2017

Stefan Behrend
Ministry of Environment, Agriculture
and Energy Saxony-Anhalt
stefan.behrend@mule.sachsen-anhalt.de

Legal basis and basic documents - international

■ Stockholm Convention on POPs

- Republic of Serbia is party (sign: 2.5.2002, rat: 31.7.2009, in force: 29.10.2009)
- EU is party (sign: 23.5.2001, appr: 16.11.2004, in force: 14.2.2005)
- Implementation is needed

■ Conv. long-range transboundary air pollution CLRTAP POPs-Protocol (Aarhus 1998)

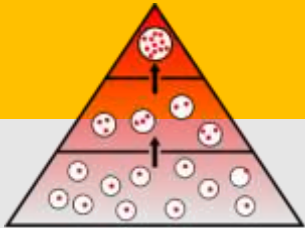
- Republic of Serbia is party (access: 26.3.2012)
- EU is party (sign: 24.6.1998, appr: 30.4.2004)
- Implementation is needed

■ Rotterdam Convention on PICs

- Republic of Serbia is party (access: 31.7.2009, in force: 29.10.2009)
- EU is party (sign: 11.9.1998, appr: 20.12.2002, in force: 24.2.2004)
- Implementation is needed

Legal basis and basic documents - international

biomagnification of lipophil substances



**chemical and biological stability
long half-life periods**

Persistence

**ability of long-range transportation,
adhesive, food chain**



toxic for health and environment

Legal basis and basic documents - international

- **Basel Convention on transboundary movement of hazardous wastes and their disposal**



<http://www.brsmeas.org/>

- **Technical-Guidelines of the Basel Convention/UNEP**
 - General technical guideline on POPs (07/2015), umbrella guide
 - On Pesticides (BC 12/3, 07/2015)
 - On DDT (06/2007)
 - On PCB, PCT, HBB (07/2015)
 - On unintentionally produced POPs (07/2015)
 - On HBCD (07/2015)
 - On PBDE (07/2015)
 - On PFOS (07/2015)
 - <http://www.basel.int/Implementation/Publications/TechnicalGuidelines/tabid/2362/Default.aspx>

Legal basis and basic documents - European

- **EU-Regulation 850/2004 on POPs**
 - Definition, stockpiles are waste, report duty > 50 kg
 - specific requirements on POPs waste, destruction of POPs
 - Latest amendment EU-Regulation 2016/460
- **Waste Framework Directive 2008/98**
 - Waste definition, hierarchy
 - classification (ELW), Annex III (HP-criteria)
 - supervision of hazardous wastes, registration
 - licensing of waste management installations
 - waste oil
- **Directive 96/59/EC on the disposal of PCB/PCT**
- **WEEE-Directive 2012/19/EU , RoHS-Directive 2011/65/EU**

Legal basis and basic documents - European

- **Regulation 1272/2008 on classification, labelling and packaging of chemicals (CLP)**

- C&L-inventory
- harmonised classification of substances and mixtures

- **Regulation 1907/2006 on registration, evaluation, authorisation and restriction of Chemicals (REACH)**

- PBT substances (HBCD, PFOS)
- PBD and vPvB substances (SCCP, c-Deca-BDE)
- Annex XIII REACH

- **required for classification as SVHC subst. transformation into Annex XIV REACH (HBCD)**

	Persistence if the half-life in ... is					Bioaccu- mulation if	Toxicity if		
	Marine water	Fresh or estuarine water	Marine sediment	Fresh or estuarine sediment	soil	BCF	NOEC for marine or freshwater organisms	CMR- categories	CLP
PBT	> 60 d	> 40 d	> 180 d	> 120 d		> 2000	< 0,01 mg/l	C: 1A, 1B M: 1A, 1B R: 1A, 1B, 2	STOT RE 1, 2
vPvB	> 60 d		> 180 d			> 5000			

Legal basis and basic documents - Serbian

■ Law on Waste Management

- national implementation, ratification

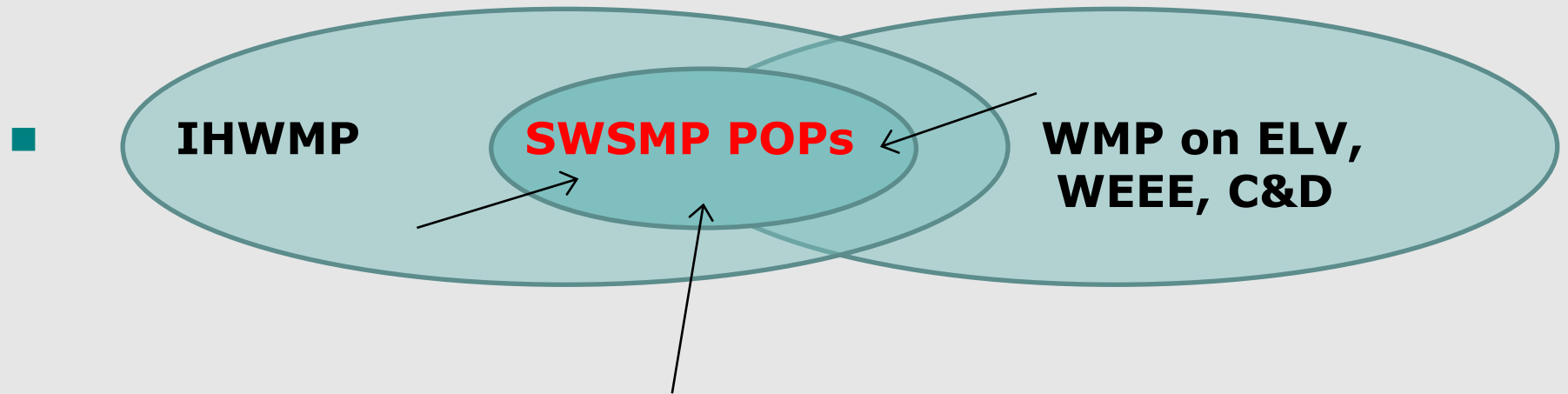
■ Law on Chemicals

- national implementation, ratification

■ Article 11 Waste Law: Provisions for WMPs

- National IHWMP (finalised within the Twinning project)
- 5 years valid
- All hazardous waste streams covered including POPs waste
- National SWSM plan for POPs waste

Legal basis and basic documents - Serbian



- **National Implementation Plan Stockholm Convention**

- Updated 2015
- Elaboration of a current inventory
- Amount of POPs and POPs wastes
- Derivation of proper waste management activities

- ...

Drafting of the SWSP for wastes containing POPs

■ Three workshops:

- General considerations for the planning process and on the current status; 18th of November 2015

■ Break

■ Restart

■ workshop II

7 November 2016

■ Workshop III

23 February 2017

■ Finalising POPs WMP

7 April 2017

Time schedule POPs SWSP



Drafting of the SWSP for wastes containing POPs

- **Structure of the POPs WMP according to the IHWMP**
 - **Introduction**
(Overall waste problematic; Role of the plan in waste management planning...)
 - **Legal framework for the management of POPs wastes (international and European policy; Serbian policy)**
 - **Institutional Set-up**
(Ministry; SEPA; environmental inspection; Statistics; testing...)
 - **Current status of POPs waste management (quality; quantity)**
 - **Collecting and disposal systems**
 - **Forecast of POPs wastes**
 - **Assessment of needs for waste management structure**
 - **Financing**
 - **Objectives and action plan**

Legal requirements on POPs waste

POP	Ann. A Elimination	Ann. B restriction	Ann. C unintent.	remarks	pesticide	industrial chemical	unintentional product
The "Dirty Dozen"							
Aldrin	X				X		
Chlordane	X				X		
Dieldrin	X				X		
Endrin	X				X		
Heptachlor	X				X		
Hexachlorobenzene	X		X		X	X	X
Mirex	X				X		
Toxaphene	X				X		
PCBs	X		X			X	X
DDT		X			X		
PCDD/PCDF			X				X
New POPs							
Chlordecone	X			SC-4/12	X		
HCH and Lindane	X			SC-4/10 SC-4/11 SC-4/15	X		
Te-, Pe-, Hx-, HpBDE	X			SC-4/18 SC-4/14		X	
Pentachlorobenzene	X		X	SC-4/16	X	X	X
PFOS		X		SC-4/17		X	
Hexabromobiphenyl	X			SC-4/13		X	
Endosulfans	X			SC-5/3	X		
Hexachlorobutadiene	X			SC-7/12		X	
PCN	X		X	SC-7/14		X	X
SCCP	only proposed for listing under the Stockholm Convention						
HBCD	X			SC-6/13		X	
PCP	X			SC-7/13	X		

Legal requirements on POPs waste

■ Art. 7 of Regulation 850/2004

- Destruction of POP-compartments very limited acc. to Annex V:
 - **R1** (energetical recovery), **not for PCB**
 - **D10** (thermal disposal), grate, rotary kiln
 - **D9** (chemical-physical treatment),
 - **R4** (metal recovery, restricted on Fe- and NE-recovery from plants which meet the limit values on PCDD/PCDF from Incineration Directive 2000/76/EC), **not for PCB**
- in general destruction of POPs required above lower limit values acc. to Annex IV):
 - 15 µg/kg PCDD/PCDF (TEQ)
 - 10 mg/kg PCN
 - 100 mg/kg Hexachlorobutadiene
 - 1000 mg/kg Σ PBDE
 - 1000 mg/kg HBCD (to be reviewed by the EC until 20.4.2019)
 - 10000 mg/kg SCCP
 - 50 mg/kg all others
 - **???** **PCP, further new POPs**

Legal requirements on POPs waste

- **Art. 7 of Regulation 850/2004**
 - **exceptional divergent non-destructive disposal up to upper limit values acc. to Annex V:**
 - 5 mg/kg PCDD/PCDF (TEQ)
 - 50 mg/kg PFOs, PCB
 - 1000 mg/kg HBCD, Hexachlorobutadiene, PCN
 - 10000 mg/kg SCCP, Σ PBDE
 - 5000 mg/kg all others
 - ??? PCP, further new POPs
 - **Condition: Permanent storage acc. requirements of landfill Directive in**
 - deep underground rocks,
 - salt mines, **safety assessment acc. Decision 2003/33/EC, no limit values**
 - **Landfills for hazardous wastes** as solidified or stabilised waste
 - Proof that storage is environmental favourable compared with destruction
 - only for certain **mineral wastes (ELW-chapter 10, 17, 19)**

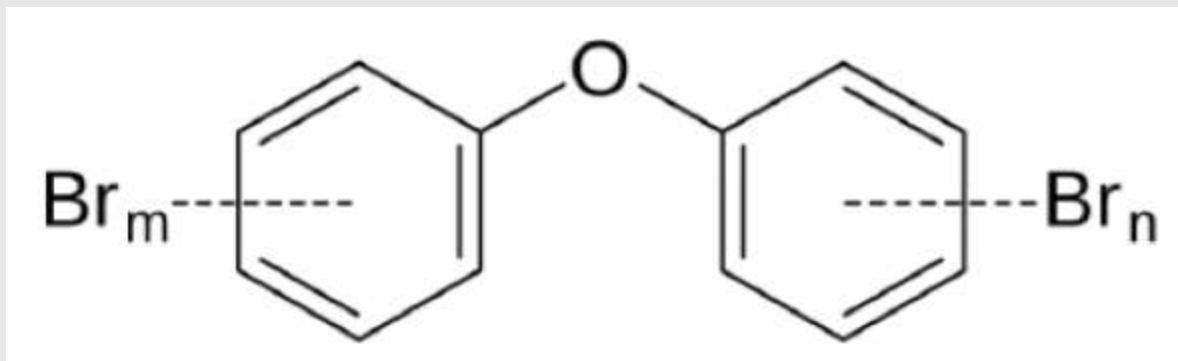


An EU funded project

Development of the Special waste stream plan SWSP for wastes containing POPs

3rd Workshop
23rd of February 2017
Stefan Behrend

Data on PBDE



Data on PBDE; former use

- Tetra-, Penta-, Hexa-, Hepta-BDE in c-pentaBDE and c-octaBDE
- Future POP: Deca-BDE

- Flame retardant (protective coating)
- insulation and construction foam (PUR-foam) (31 %)
- HIPS, Electrical and electronic industry (56 %)
- Furniture, textile, carpets (13 %)

- Use as mixtures of 209 congeners:

Commercial Mixtures	PBDE congener groups and concentrations of active ingredient						
	tetraBDE	pentaBDE	hexaBDE	heptaBDE	octaBDE	nonaBDE	decaBDE
	BDE-47, etc.	BDE-99, etc.	BDE-153, BDE-154, etc.	BDE-175, BDE-183, etc.	BDE- 203,BDE -204, etc.	BDE- 207,BDE- 208	BDE-209
c-pentaBDE	24 – 38%	50 – 62%	4 – 12%	Trace	-	-	-
c-octaBDE	-	0.5%	12%	45%	33%	10%	0.7%
c-decaBDE	-	-	-	-	trace	0.3 – 3%	97 – 98%

Data on PBDE; former use

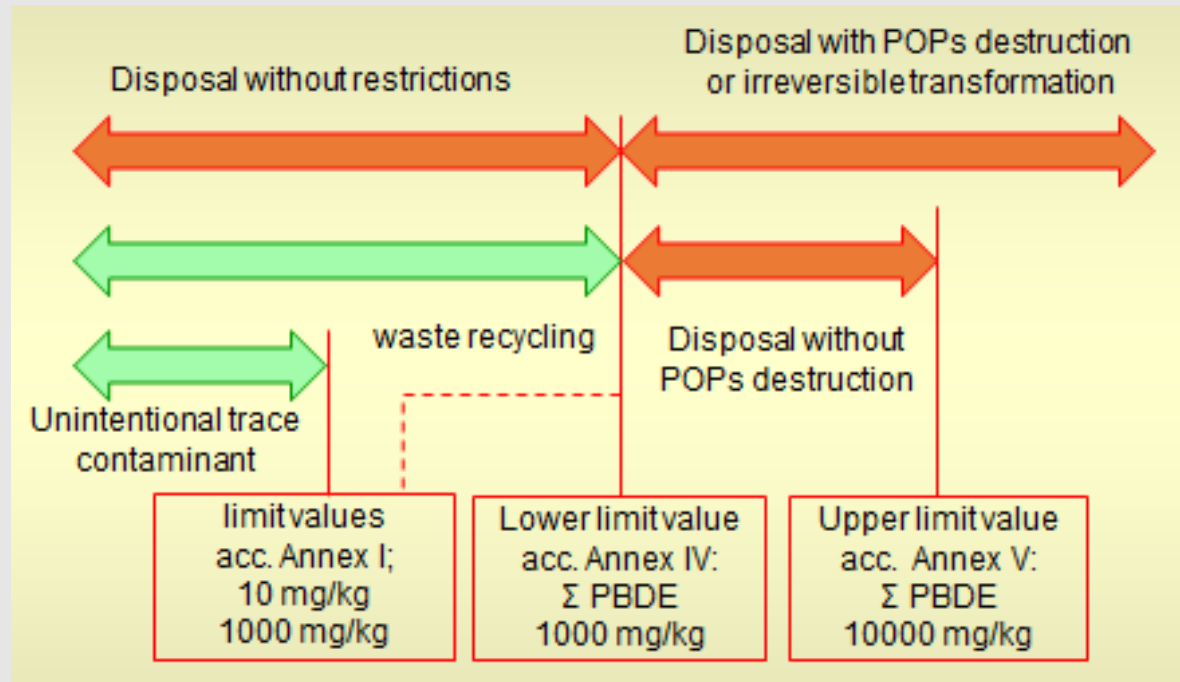
- C-pentaBDE was produced up to 2004 in Australia, EU, Israel, USA
total amount 91,000 to 105,000 tons
- C-OctaBDE was produced in F, Japan, Israel, NL, UK, USA
total amount 102,700 to 118,500 tons
- Deca-BDE (80 % in electric and electronic equipment)
56.000 t/a, total amount 1.1 to 1.25 Mio. tons

- NIP: inventory for Serbia 2013:
38 to 87 tons total tetra-, penta-, hexa-, hepta-BDE
corresponds to 0.02 to 0.045 % of the world production

- concentration in products between 5 and 30 %
- calculated amount of PBDE-containing products between 130 and
maximum **1740 tons ???**

Data on PBDE; former use

- Exemptions acc. to Stockholm Convention: EU has registered all relevant PBDE for the further use without expiry date
- Regulation 850/2004: also EEE in accordance with RoHS (limit 1000 mg/kg)



Data on PBDE; sources

- **obsolete stockpiles in production plants**
- **products that become waste, especially WEEE, plastics, textiles**
- **construction material (PUR-foam)**

- **Main source: waste management activities**
 - **Dismantling of WEEE (20 enterprises in Serbia, WMP on WEEE)**
 - **Dismantling of vehicles**
 - **Shredder plants (vehicles, WEEE, bulky wastes)**
 - **Recycling of plastics and mineral wastes, residues of sorting**

- **from cradle to grave release into the environment**
no chemical but physical connection to the product's surface
- **sewage sludge, landfill leachate**

- **Import of devices from countries without prohibition of PBDE**

Data on PBDE; sources

- 16 01 04* discarded vehicles
- 16 01 06 end-of-life vehicles, containing neither liquids nor other hazardous components
- **16 01 22 components not otherwise specified (shall be relevant for impregnated seats and plastic parts)**

- 16 02 13* discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12
- **16 02 15* hazardous components removed from discarded equipment;**
- **20 01 35* discarded electrical and electronic equipment** other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components

- **19 10 03* fluff-light fraction and dust containing dangerous substances**
- **19 12 08 textiles**

- 17 06 03* other insulation materials consisting of or containing dangerous substances;

- 04 02 "wastes from the textile industry",
- 07 02 "wastes from the MFSU of plastics, synthetic rubber and man-made fibres";
- 08 "Wastes from MFSU of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks
- 20 03 07 bulky waste.
- 19 08 11*/12 and 19 08 13*/14 for sludges from biological and other external treatment of waste water,

Data on PBDE; sources

- **Stockholm Convention guidance:**
 - 0.16 kg PBDE per car (truck)
 - 1 kg PBDE per bus
- **WMP on ELV:**
 - About 48,000 ELV/a, identical NIP
 - In addition 35,000 trucks and 200 buses p.a. (NIP)
- **PBDE in ELV: 13.5 tons**
- **PBDE compartments from ELV: 15,360 tons**
 $0.1 \times (48,000 \times 1 + 35,000 \times 3 + 200 \times 3)$
- **Use between 1970 and 2005, life time of cars average 18 years decreasing amount from 2023**

Data on PBDE; sources

- **WMP on WEEE**
Totally treated
WEEE in Serbia
2015: 27,300 tons

- **Use of PBDE for plastic parts (chassis) and electric parts (circuit boards)**

WEEE-category ^α		WEEE-amount ^α		Plastic parts ^α		Electric parts ^α	
		General share ^α [%] ^α	Amount Serbia ^α [tons] ^α	Share ^α [%] ^α	Derived amount ^α [tons] ^α	Share ^α [%] ^α	Derived amount ^α [tons] ^α
Large household appliances ^α		27.7 ^α	7560 ^α	12.4 ^α	940 ^α	0,1 ^α	7.5 ^α
Cooling-/freezing appliances ^α		17.7 ^α	4830 ^α	25 ^α	1200 ^α	10 ^α	480 ^α
Monitors, CRT ^α		21.6 ^α	5900 ^α	4 ^α	240 ^α	8 ^α	470 ^α
Small household appliances ^α	larger ^α	7 ^α	1910 ^α	13 ^α	250 ^α	0,2 ^α	4 ^α
	smaller ^α	3.6 ^α	980 ^α	46 ^α	450 ^α	0,1 ^α	1 ^α
	Tools, toys... ^α	2.5 ^α	680 ^α	10 ^α	70 ^α	0,4 ^α	2,5 ^α
total ^α		^α	^α	^α	3150 ^α	^α	965 ^α

- **Total amount calculated with about 4,000 tons**
expected 8,000 to 10,000 tons because of more WEEE than treated

Data on PBDE; reasonability

- **27,300 t WEEE annually, can be stated from XRF screening test in one WEEE-recycling plant (2014) about 500 t per month and 1/5 of the Serbian territory = 30,000 t**
- **Calculated amount of PBDE compartments is max. 10,000 t/a from WEEE about 15,000 t/a from ELV general share of PBDE in EEE is 56 % but includes decaBDE**
- **Summary expected 25,000 t/a PBDE containing wastes from waste treatment plants
ELV: expected decrease (car life-time 18 years)
WEEE: equal or expected increase (decaBDE)**

Data on PBDE; recommended measures

■ build an inventory

- identify relevant sectors that use or produce PBDE
- collecting and compiling statistical data on the production, use, import and export of PBDE
- estimation, report, update

■ analytical methods

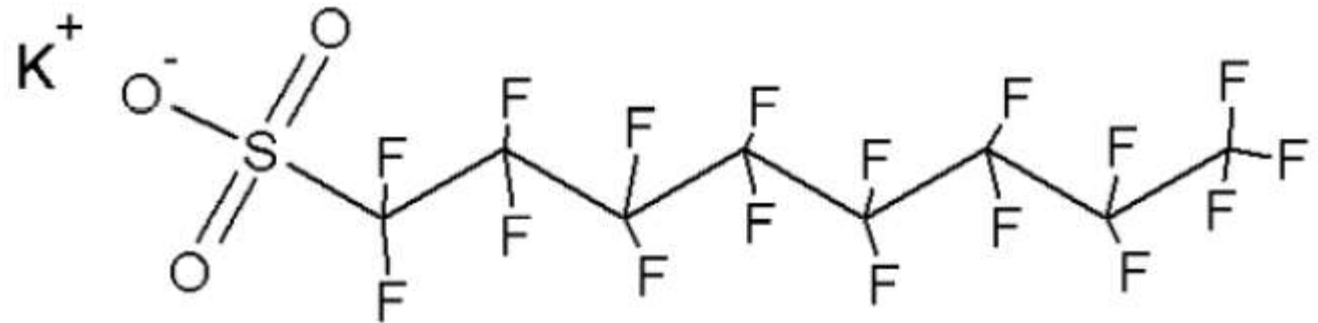
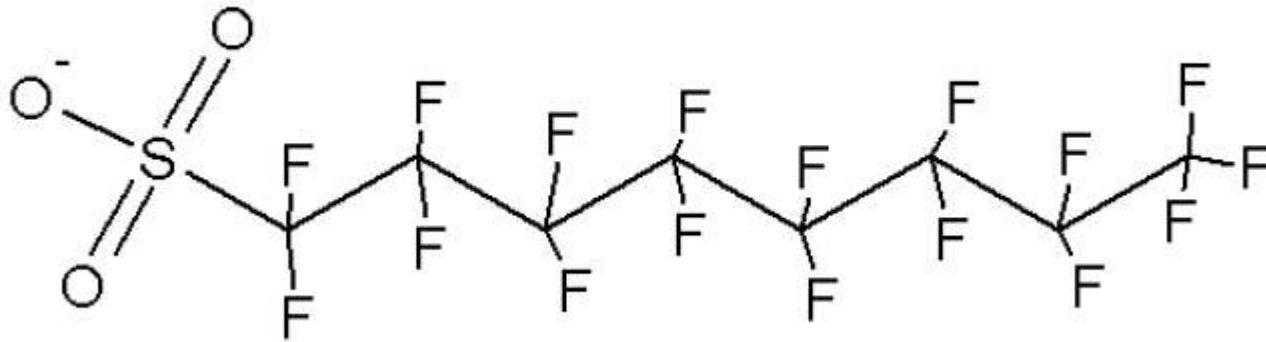
■ monitoring in environment

waste water treatment

■ health sector, production plants

■ awareness rising in the public sector

Data on PFOS and its salts



Data on PFOS; former use

- **Perfluorooctanesulfonic acid and its salts**
In future: PFOA perfluorooctanoic acid and its salts
- **Non reactive**
low surface tension
chemical stability
resistant to acids and high temperature
hydrophob and lipophob
- **Production of Teflon**
- **coatings in textile and paper industry**
- **Galvanic, metal plating**
- **Fire fighting foam**
- **...**

Data on PFOS; former use

- **EU total:**
12 t/a
equal use
supposed
40 years
(from 1960s)
the inventar
is 480 t

(11 %)

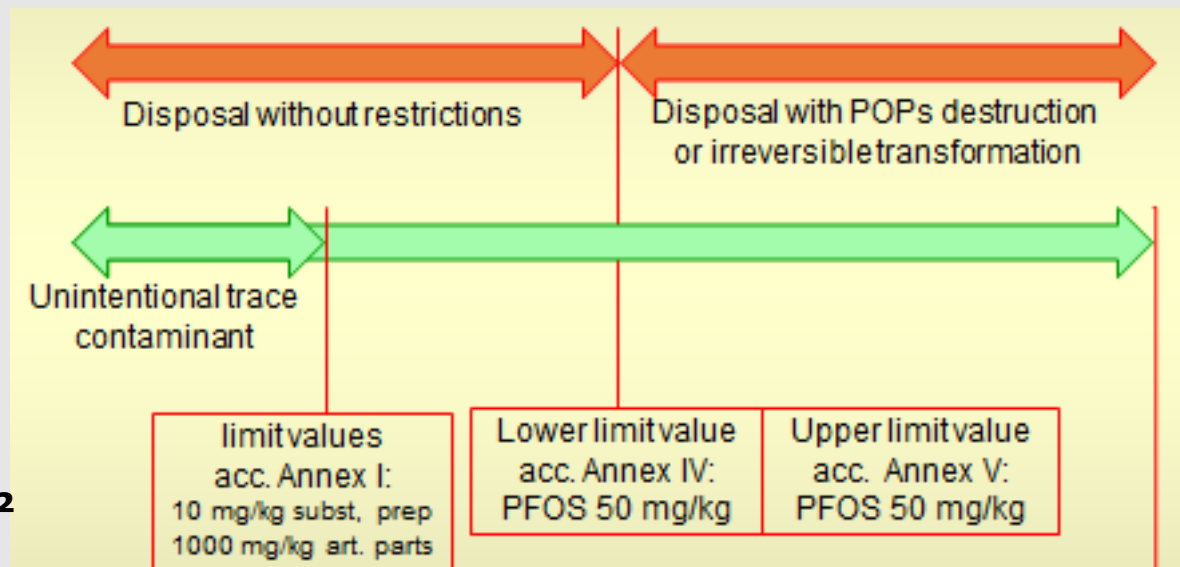
Industry Sector	Application	Quantity (kg/year)
Metal Plating	Chromium plating	10,000
	Anodising and Acid pickling	20-30
Photographic Industry	Paper products	<50
	Printing plates	<100
	Film products	>850
	Total	1,000
Semiconductor Industry	Photoresists	46
	Edge bead removers	86
	Top antireflective coatings	136
	Bottom antireflective coatings	8
	Developers (surfactant)	195
	Total	471 (assumed 500)
Aviation Industry	Hydraulic fluids	730

- **Global: 4481 t total**
48.2 % industrial surface treatment
33.2 % paper mills
3.4 % fire fighting foams
15.2 % others, hydraulic fluids, etching baths, coating additives...

Data on PFOS; former use

- **EU-notification of further use**
photo-imaging, photo coatings, etching agents,
aviation hydraulic fluids, metal plating
- **Expired temporary time limits**
use of fire fighting foam (placed on market up to 2006): **27.6.2011**
production and use for electro plating: **26.8.2015**

- **10 mg/kg**
trace contaminant
1000 mg/kg (0,1 %)
semi products, articles
- **1 µg/m² (< 0,0006 %)**
coatings (textiles...)
grammatur > 150 g/m²

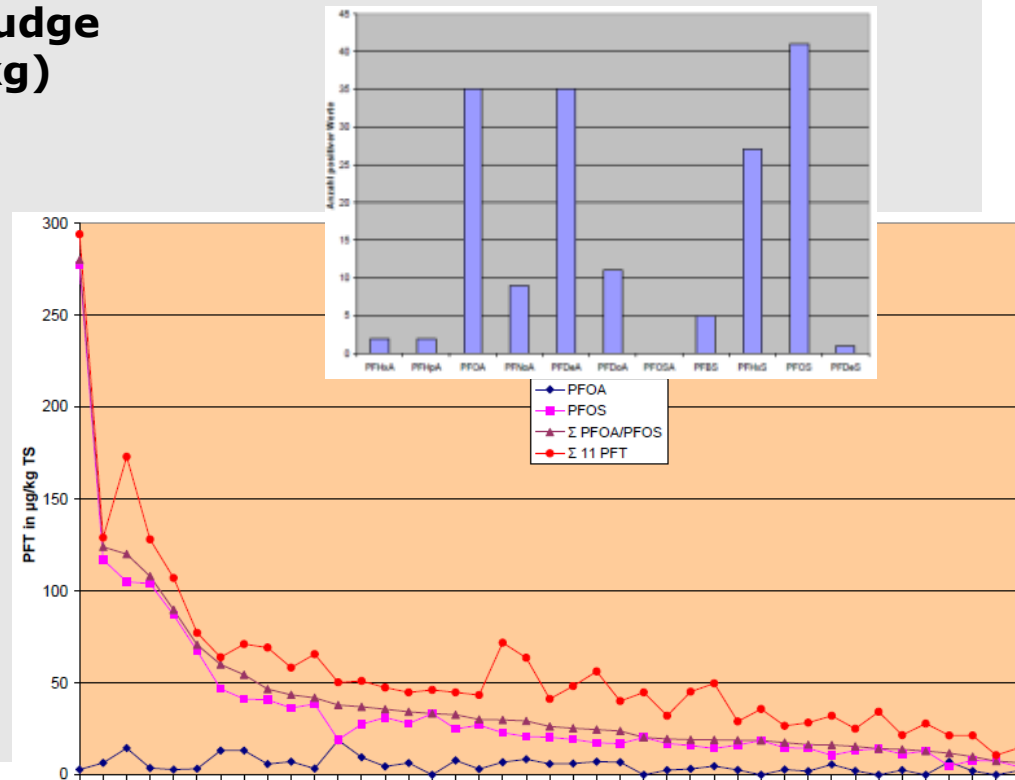


Data on PFOS; former use

- **No reported data about PFOS imports to Serbia**
possible imports within products and semi-products
PFOS containing fire-fighting foam spent 1999 (NATO bombing)
- **480 tons PFOS in Europe**
respective supposed 6.7 tons in Serbia
(ratio of population 510/7.1 Mio.)
 - **0.228 t in fire fighting foam, 5-60 g/kg = 3.8 to 45.6 tons fire fighting foam**
 - **2.2 t in paper, 0.1 to 5 g/kg = 44 to 2,200 tons coated paper**
 - **3.23 t in coatings, 1 to 10 g/kg = 323 to 3.230 tons in coated articles**
 - **1 t others, 0.5 to 500 g/kg = 2 to 2.000 tons hydraulic fluids, and other products**
- **375 to 7.470 tons PFOS products in total, average expected: 5.000 tons in total**
over an average life-time of 20 years = 250 t/a

Data on PFOS; sources

- **High concentration in indoor air (coated carpets/surfaces in flats, offices): 30 to 570 times more than in outside air;**
- **Waste water from industry and households; waste water treatment plants do not degrade/destroy PFOS**
Result: PFOS is part of sewage sludge (up to 30 % of plants > 100 µg/kg) and cleaned water
- **Contamination of natural water resources including drinking water**
- **Contamination of soil by using sewage sludge for fertiliser**
- **Result of incineration: possibly generation of PBDD/PBDF**



Data on PFOS; recommended measures

- **Because of high potential for biomagnification:**
 - **Determination of limit values for drinking water (0,3 µg lifetime, 0,1 µg maximum annual average)**
 - **Monitoring of natural water resources and organisms**
- **Limit values for fertilisers from sewage sludge: 100 µg/kg**
Additional soil monitoring especially on sites where sewage sludges are used

Data on HBCD



Data on HBCD; former use

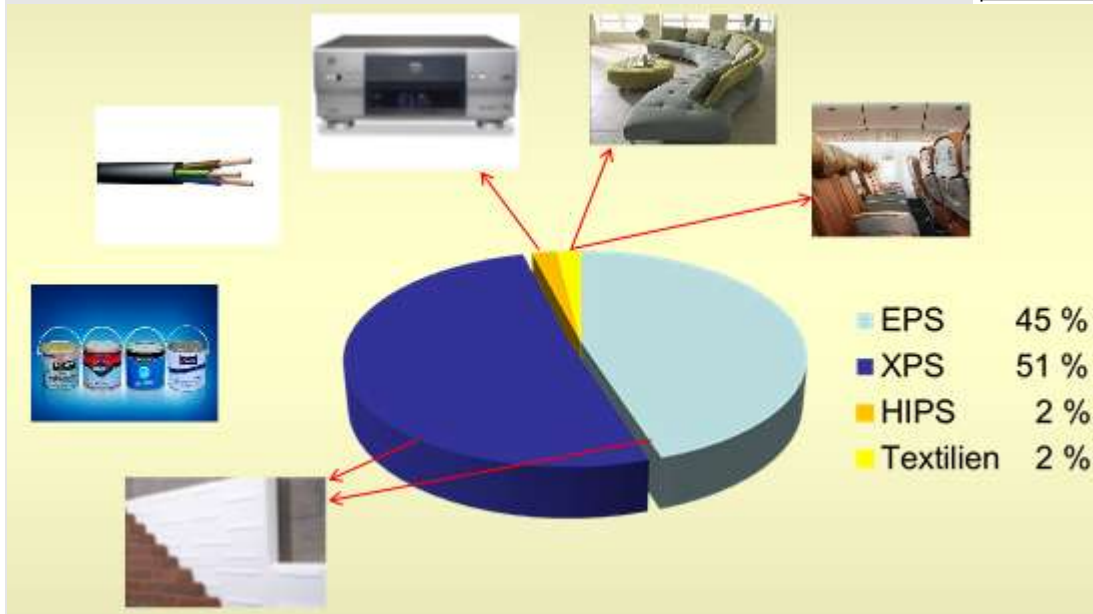
- Flame retardant for plastics
 - Mainly in EPS (7000 mg/kg) and XPS (15,000 mg/kg)
 - HIPS (40,000 mg/kg)
 - foam insulation material, Polymer dispersions for textiles (6 – 15 %)
 - Partly in PS packaging material (import)
-
- 2011 about 6000 t/a produced in EU,
31,000 t worldwide (7000 USA, 18,000 Asia)
 - Further 6000 t/a imported to EU
substances and preparations
 - Net import within
articles unknown



Data on HBCD; former use

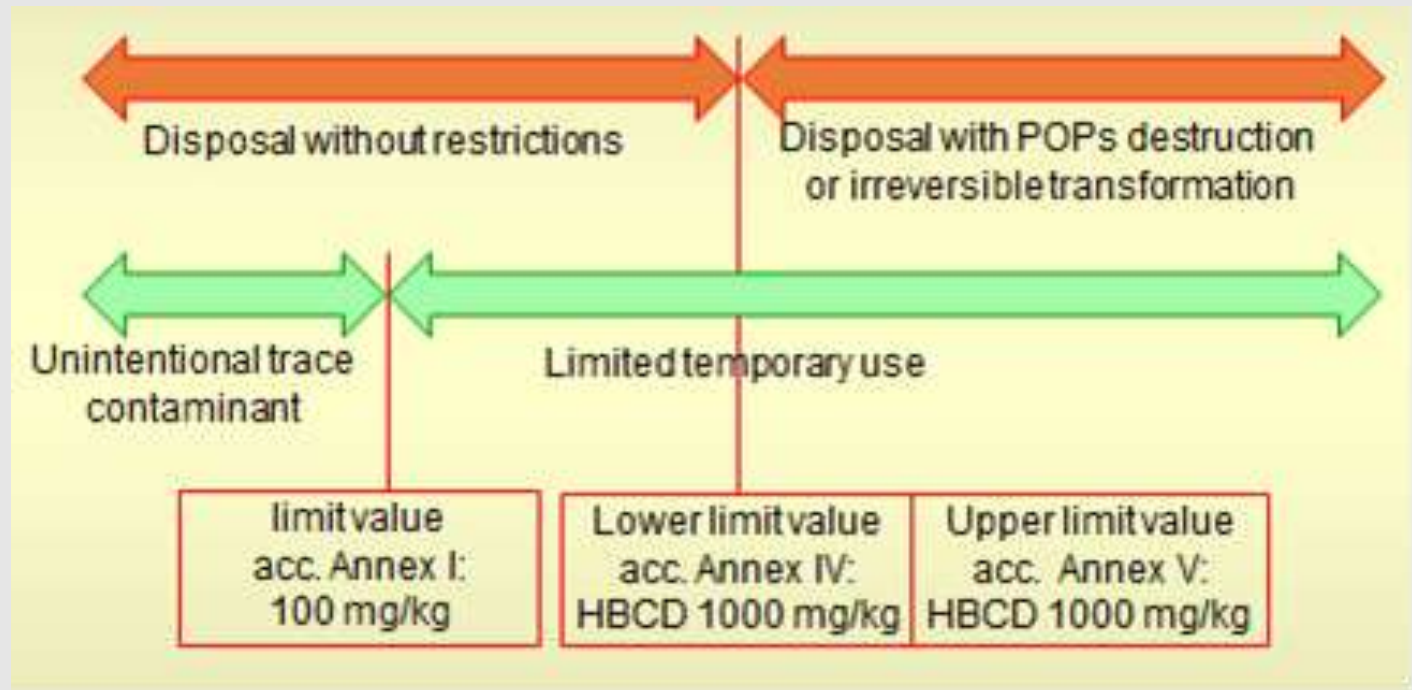
■ Use of the 12000 t/a as follows:

	Tonnes HBCDD /year	Number of sites
Expanded Polystyrene	5,300	21
Extruded Polystyrene	5,900	28
High Impact Polystyrene	200	3
Textile coating	200	16
Total	11,600	47



Data on HBCD; former use

- Production and use in general prohibited since 03/2016
- < 100 mg/kg trace contaminants
- Exceptional further production, market placing and use of HBCD for unexpanded pellets and EPS-articles, authorization acc. REACH



Summary of European Commission Decisions on authorisations for the placing on the market for the use and/or for use of substances listed in Annex XIV to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

(Published pursuant to Article 64(9) of Regulation (EC) No 1907/2006 (*)

(Text with EEA relevance)

(2016/C 10/04)

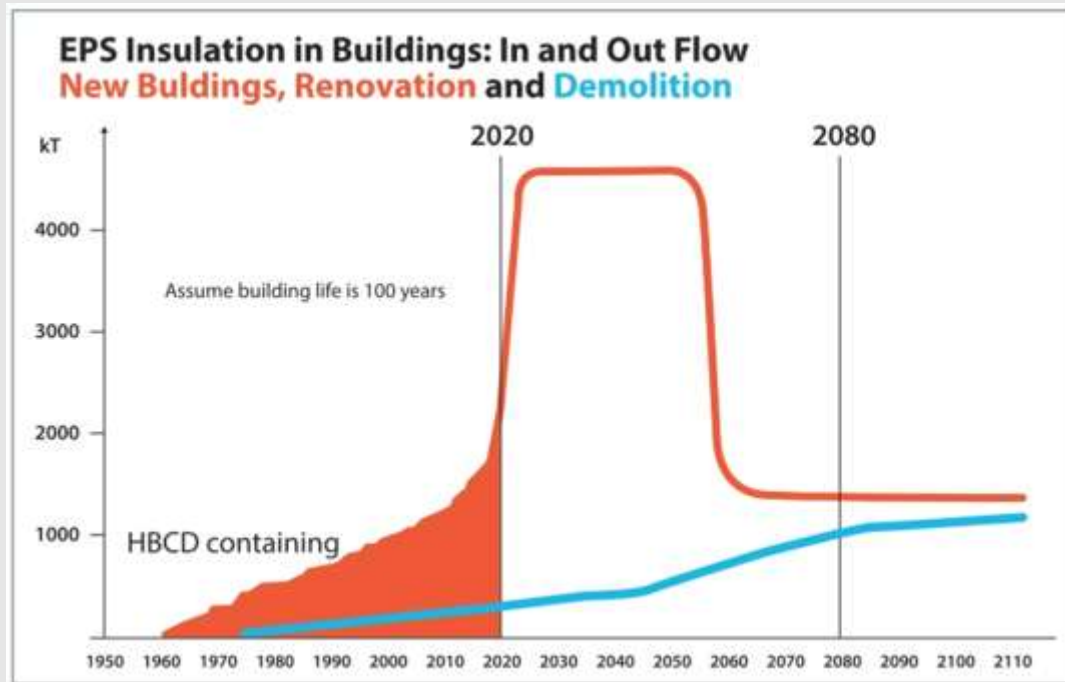
Decisions granting an authorisation

Reference of the decision (*)	Date of decision	Substance name	Holder of the authorisation	Authorisation number	Authorized use	Date of expiry of review period	Reasons for the decision
C(2015) 2212 final	21.2.2016	Hexabromocyclododecane (HBCDD) EC No. 221-695-9 247-148-4	INEOS Seyrenics Netherlands BV, Lijndonk 25, 4825 BG, Breda, Netherlands	REACH/15/6/0 REACH/15/6/1	Formulation of flame-retarded expanded polystyrene (EPS) to solid unexpanded pellets using HBCDD as the flame retardant additive (for onward use in building applications)	21 August 2017. The authorisation shall cease to be valid on 21 August 2017 with regard to the holders of the authorisation who have not submitted a review report by 21 February 2016, unless a decision to withdraw the authorisation is adopted earlier in application of Article 61(2) and (3) of Regulation (EC) No 1907/2006	In accordance with Article 60(4) of Regulation (EC) No 1907/2006, the socioeconomic benefits outweigh the risk to the environment arising from the use of the substance and there are no suitable alternative substances or technologies available in sufficient quantities. However it is expected that a polymeric flame retardant, once its successful testing and certification has been completed, will become a feasible alternative and available in sufficient quantities to meet the estimated demand by 2017. The authorisation holders are required to submit a report to the Commission on a three-monthly basis on the available quantities of the polymeric flame retardant on the market and on the progress towards substitution of HBCDD.
			INEOS Seyrenics Ribécourt SAS, 704 rue Pierre et Marie Curie, 60170, Ribécourt, France	REACH/15/6/2 REACH/15/6/3	Production of flame-retarded expanded polystyrene (EPS) articles for use in building applications		
			INEOS Seyrenics Winglez SAS, Rue du Plat, 62410, Winglez, France	REACH/15/6/4 REACH/15/6/5			
			Symbos Dworky 7 Spółka z ograniczoną odpowiedzialnością, spółka jawna, ul. Chemików 1, 32-600, Oświęcim, Poland	REACH/15/6/6 REACH/15/6/7			

Data on HBCD; source of insulation material

- **NIP: 2011 imported 2,750 tons HBCD granulate**
- **2011 overall HBCD quantity in Serbia > 37 tons
share of EPS/XPS (96 %) is almost 36 tons**
- **provided that each 1/2 was used for EPS and XPS, the amount can be calculated as**
18 tons / 0.007 = 2570 tons EPS
18 tons / 0.015 = 1200 tons XPS
- **expected amount of waste 3800 tons/a EPS/XPS Material**
rational compared with Germany (50,000 to 80,000 tons related to the population of 82 Mio.)
considering a lower degree of climate protection measures in Serbia

Data on HBCD; source of insulation material



waste code	description
17 06 03*	other insulation materials consisting of or containing dangerous substances
17 06 04	insulation materials other than those mentioned in 17 06 01 and 17 06 03
17 09 03*	other construction and demolition wastes (including mixed wastes) containing dangerous substances
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 1709 03

Data on HBCD; source of insulation material

- WEEE, Plastics, SLF ??? →16 02 13* →16 02 15* →19 10 03*
- Textiles, bulky waste, SLF ??? →20 01 11 →20 03 07 →19 10 03*
- packaging ??? →15 01 02
- sewage sludge ??? →19 08 ... →various others

LfU BY 2011:

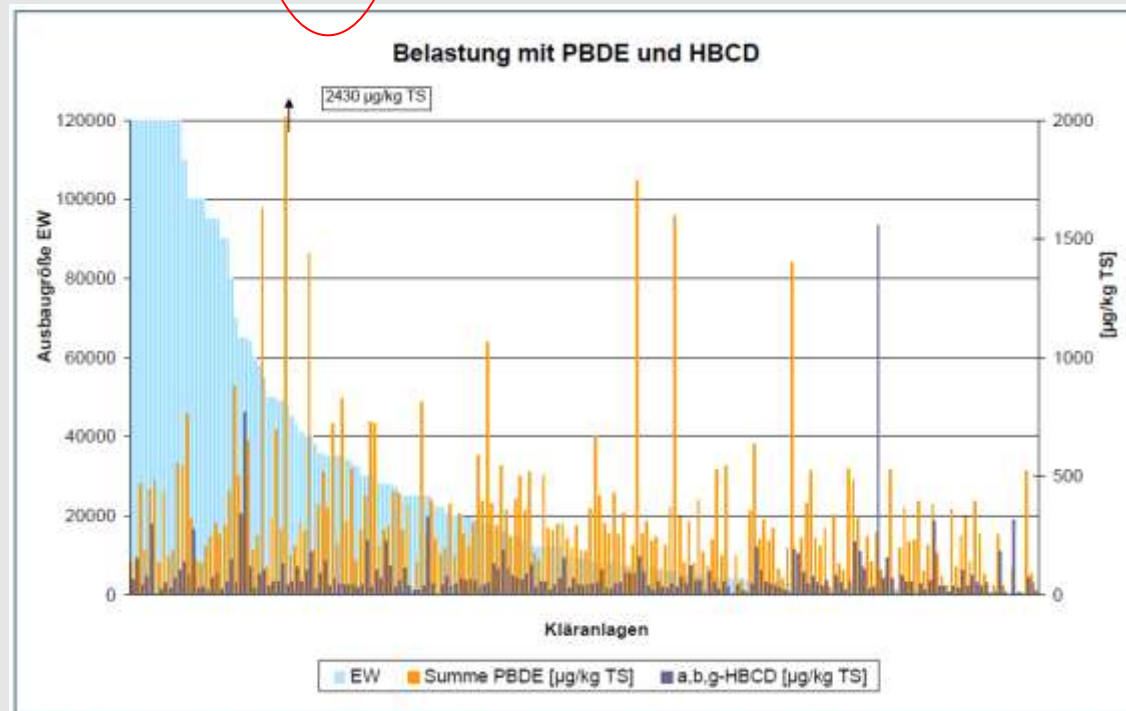
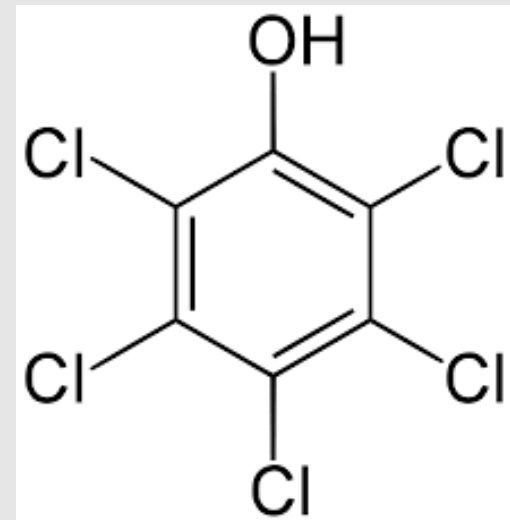
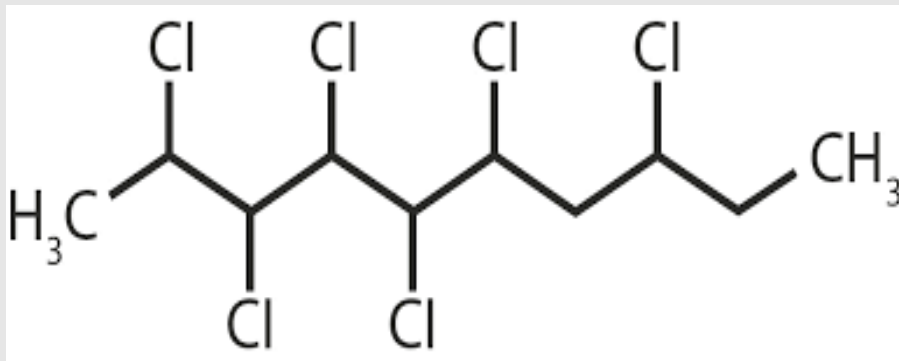
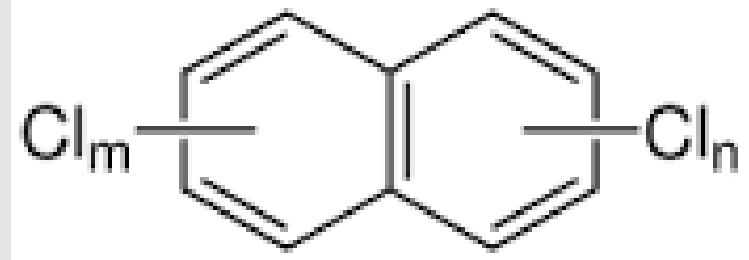
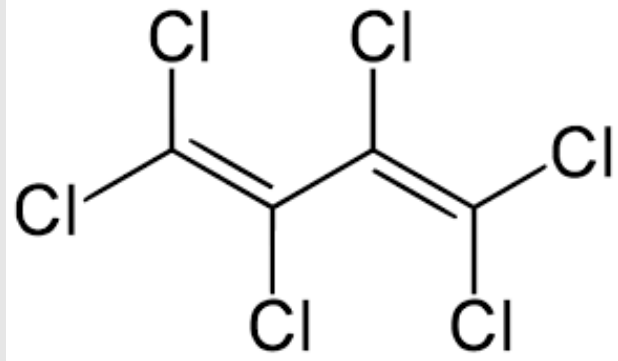


Abb. 4: Darstellung der Belastung mit PBDE und HBCD im Klärschlamm bei 194 untersuchten Kläranlagen

Data on HBCD; recommended measures

- Thermal treatment **R1, D10** together with municipal wastes state of the art but:
 - Only as part of **mixed C+D-wastes** (17 09 04) because of technical requirements (hot spots, huge parts, high calorific value...)
 - mixing on construction site or need of pre-treatment plants (Art. 18 WFD)
 - **mixtures up to 20 Vol-%** meet the requirements of limit value (1000 mg/kg related to the total mixture
repr. 14 Ma-% or 75 Vol-% EPS
repr. 7 Ma-% or 50 Vol-% XPS)
 - costs up to 400 €/t for pre-treatment (**total Serbia 1.52 Mio €**)
< 100 €/t for incineration (**total Serbia 0.38 Mio. €**)
 - no plants in Serbia
export (unmixed insulation mono material) or use of cement kilns

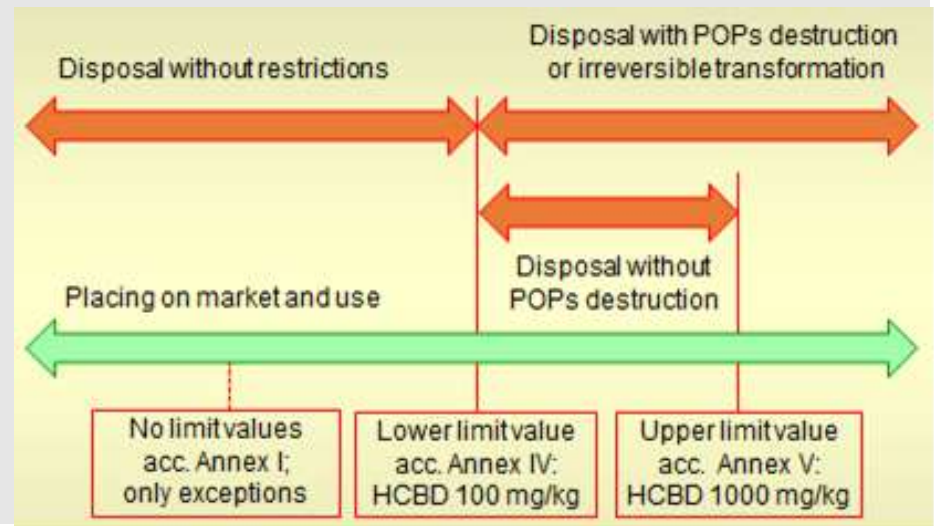
Data on other POPs



Data on other POPs

POP	use	source	remarks
HCBD	Hydraulic liquid, Solvent for elastomers, Heat transformation and cooling liquid, Gas adsorbent, biocide	Byproduct in chemical industry incineration processes	Sources of emission, products and waste not very relevant; Basic principle: state of the art incineration

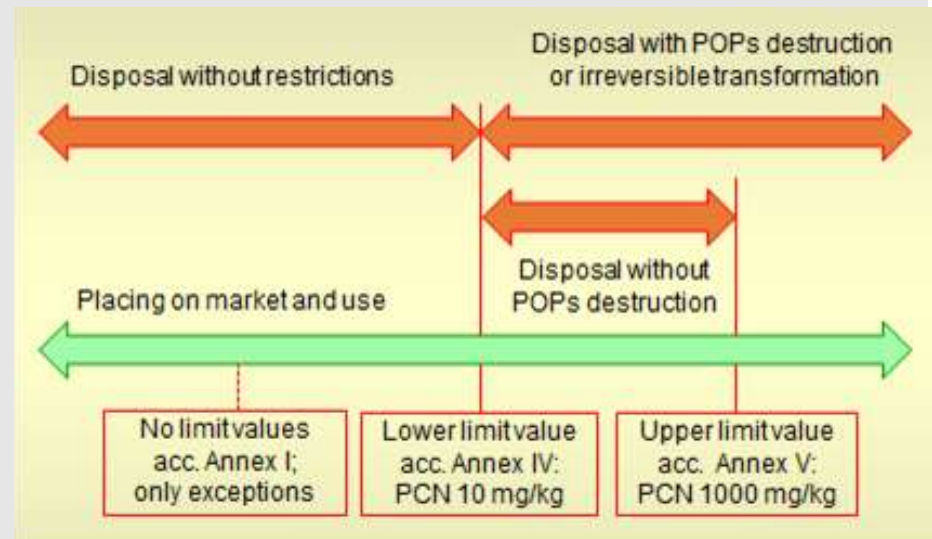
- **Placing on the market and use possible for articles**
 - **Produced up to 10.7.2012 with a time limit of 10.1.2013**
 - **Already used up to 10.7.2012 without time line, but information of Commission and Stockholm secretary**



Data on other POPs

POP	use	source	remarks
PCN	67 of 75 congeners Mixture, e.g. PCN-33/34/37 Wood preservatives, Water resistant paints, Flame retardant, Softener, PCB substitute	150000 t worldwide until 1998 Products that become waste Stockpiles	Sources of emission, products and waste not very relevant; Basic principle: state of the art incineration

- **Placing on the market and use possible for articles**
 - **Produced up to 10.7.2012 with a time limit of 10.1.2013**
 - **Already used up to 10.7.2012 without time line, but information of Commission and Stockholm secretary**

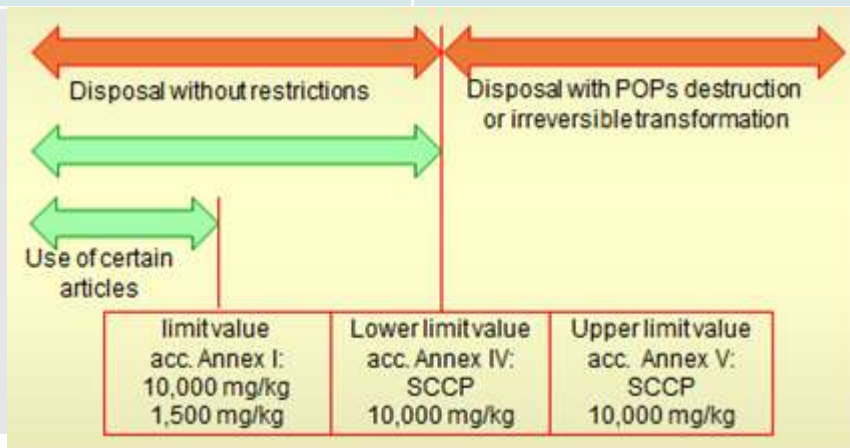


Data on other POPs

POP	use	source	remarks
SCCP	C ₁₀₋₁₃ Softener in plastics and coatings, Binding agent in paints, Greasing agent for leather and fur, Flame retardant, PCB substitute	Metal lubricants 9380 t/a Rubber 1310 t/a Paint 1150 t/a Sealants 695 t/a Leather 390 t/a Textiles 183 t/a Other 100 t/a Total 13208 t/a	Estimated waste amount (D) 176 t/a rubber industry 66 t/a sealants and glue Separation and state of the art incineration Dust protection

- **Production, placing on the market and use possible for**

- **Subst./prep. < 10,000 mg/kg**
- **Flame retardant in conveyor belts, sealings <1,500 mg/kg and already used up to 4.12.2015**
- **Other articles already used up to 10.7.2012**



Data on other POPs

POP	use	source	remarks
PCP	Wood preservatives, Textile and leather impregnation Associated with PCDD/PCD Half-life period 6 years	30-90000 t/a until 1983 Treated wood 50 > 1000 mg/kg untreated wood 50 < 5 mg/kg Migration into dust, furniture, textiles, wall papers 30 mg/kg	Estimated waste amount (D) 140 t/a Limit value for substantial recovery 3 mg/kg incineration

- **limit values not yet determined in the EU-Regulation (Annexes I, IV, V)**
- **If added to Annex I, MS shall determine respective limit values**
- **Recommended **limit value** to reduce the insertion to **products made from recycled wood: 3 mg/kg****



An EU funded project

Development of the Special waste stream plan SWSP for wastes containing POPs

many thanks for your patience and attention

**3rd Workshop
23rd of February 2017
Stefan Behrend**