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# Chemical management and new POPs (PBDEs/PFOS/PFOSE)

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# Agenda 21 (1992)

- **19. Environmentally sound management of toxic chemicals, including prevention of illegal international traffic in toxic and dangerous products**
- **19.4. Six programme areas are proposed:**
  - **(a) Expanding and accelerating international assessment of chemical risks;**
    - **OECD Screening Information DataSet (SIDS), Environmental Health Criteria by IPCS**
  - **(b) Harmonization of classification and labelling of chemicals;**
    - **Globally Harmonized System of Classification and Labelling of Chemicals (GHS)**
  - **(c) Information exchange on toxic chemicals and chemical risks;**
    - **PRTRs (Pollutant Release and Transfer Registers); Prior Informed Consent (PIC) in Rotterdam Convention**
  - **(d) Establishment of risk reduction programmes;**
    - **Stockholm Convention, Montreal Protocol**
  - **(e) Strengthening of national capabilities and capacities for management of chemicals;**
    - **National profiles under SAICM**
  - **(f) Prevention of illegal international traffic in toxic and dangerous products.**
    - **Basel convention, etc.**

IPCS: International Programme on Chemical Safety  
SAICM: Strategic Approach to International Chemicals Management



## Johannesburg Plan of Implementation (2002)

- **23.** Renew the commitment, as advanced in Agenda 21, to **sound management of chemicals throughout their life cycle and of hazardous wastes for sustainable development as well as for the protection of human health and the environment, inter alia, aiming to achieve, by 2020**, that chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment, using transparent science-based risk assessment procedures and science - based risk management procedures, taking into account the precautionary approach, as set out in principle 15 of the Rio Declaration on Environment and Development, and support developing countries in strengthening their capacity for the sound management of chemicals and hazardous wastes by providing technical and financial assistance. This would include actions at all levels to:...



Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Period																			
1	1 H																		2 He
2		3 Li	4 Be										5 B	6 C	7 N	8 O	9 F	10 Ne	
3		11 Na	12 Mg										13 Al	14 Si	15 P	16 S	17 Cl	18 Ar	
4		19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5		37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6		55 Cs	56 Ba	* 71 Lu	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7		87 Fr	88 Ra	** 103 Lr	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Uub	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo

- Elements in the original 12 POPs
- Elements introduced by some new POPs
- Elements found in mobile phones

*Lanthanoids	* 57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb
**Actinoids	** 89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No



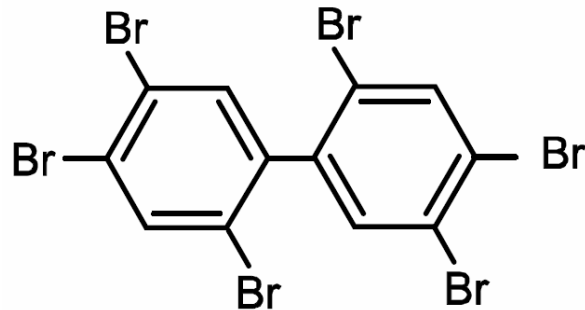
# New POPs added to the Stockholm Convention

<b>Annex A: Elimination</b>	<b>Pesticides</b>	<b>Industrial Chemicals</b>	<b>Unintentional Production</b>
Aldrin	X		
Chlordane	X		
Dieldrin	X		
Endrin	X		
Heptachlor	X		
Mirex	X		
Toxaphene	X		
$\alpha$ -HCH	X		
$\beta$ -HCH	X		
$\gamma$ -HCH (Lindane)	X		
Chlordecone	X		
Hexabromobiphenyl		X	
c-Tetra/PentaBDE		X	
c-Hexa/HeptaBDE		X	
<b>Annex B: Restriction</b>			
DDT	X		
PFOS/its salt/PFOSE		X	
<b>Annex C: Unintentional Production</b>			
Pentachlorobenzene (also listed in Annex A)	X	X	X
Hexachlorobenzene (also listed in Annex A)		X	X
Polychlorinated Biphenyls (PCBs) (also listed in Annex A)		X	X
Polychlorinated dibenzo-p-dioxins (PCDDs)			X
Polychlorinated dibenzofurans (PCDFs)			X



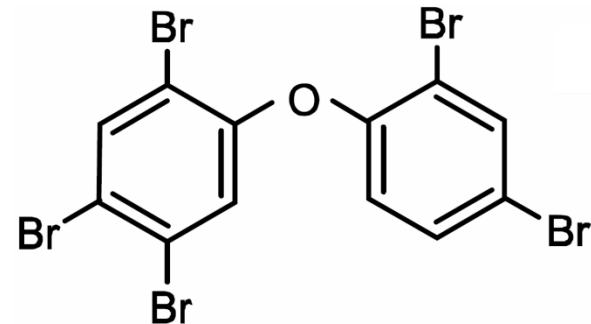
# Some of the 9 new POPs

## Annex A (no exemption)



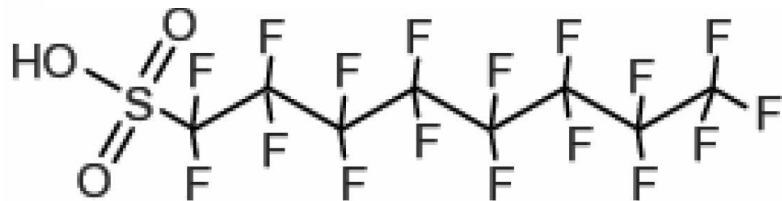
Hexabromobiphenyl

## Annex A (specific exemption for recycling by 2030)



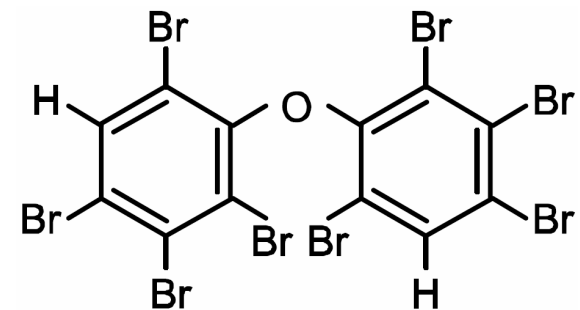
Tetrabromodiphenyl ether and pentabromodiphenyl ether

## Annex B with acceptable purposes



Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOS-F)

in photo-imaging for semi-conductors, etching, aviation hydraulic fluid, metal plating, fire-fighting foam, insect baits for leaf-cutting ants, etc.



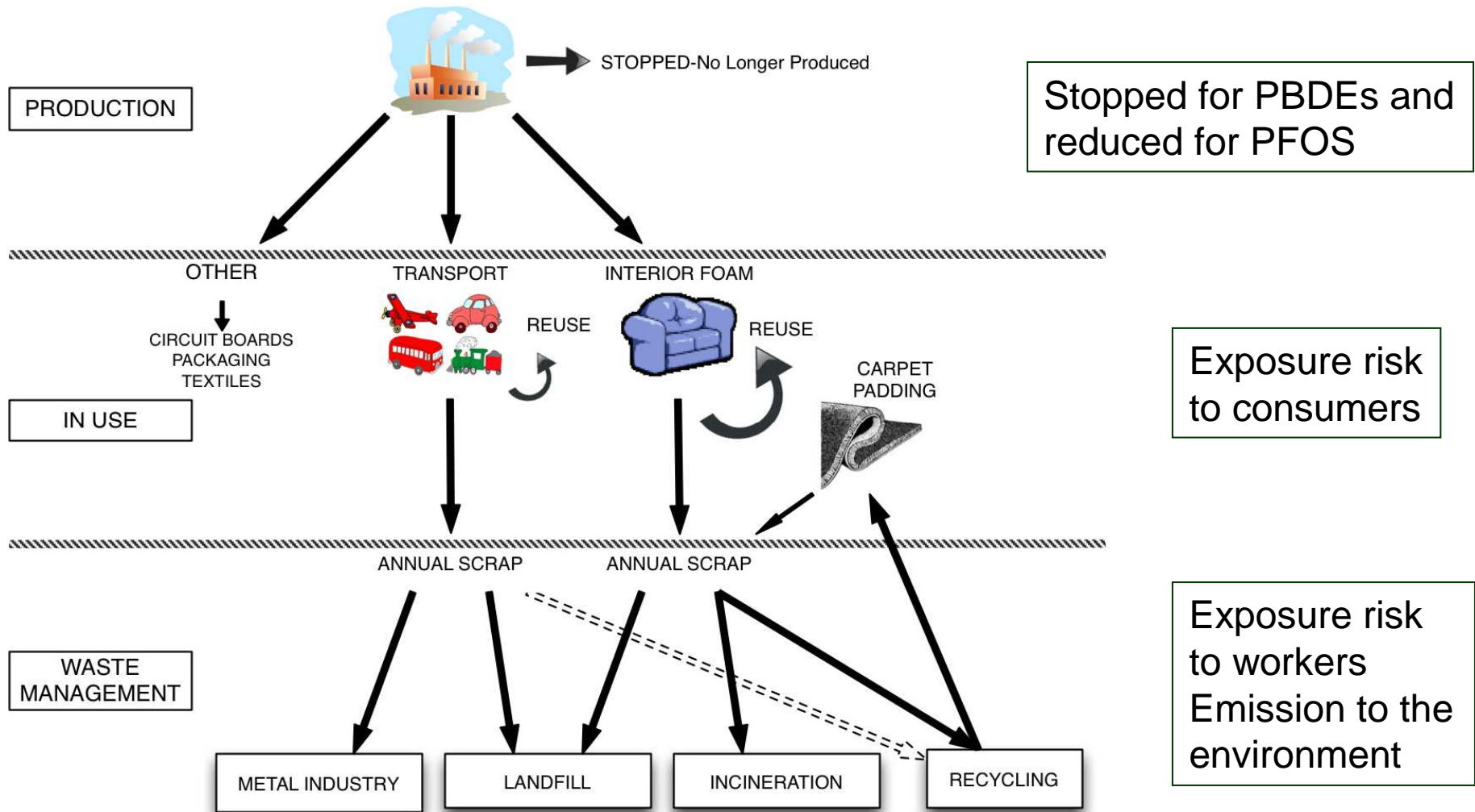
Hexabromodiphenyl ether and heptabromodiphenyl ether

## PBDEs

PBDEs: Polybrominated Diphenyl Ethers



Schematic diagram of the life cycle of **PentaBDE** (adapted from Alcock (Alcock et al. 2003)).



Watson et al., 2009



# Challenges for ESM of New POPs

- Guidelines are being prepared for inventories
- Low POPs limits are to be determined
- Chemical analysis for PBDEs and PFOS
- The approach to the ESM of the new POPs requires strategies which allow Parties to formulate risk reduction policies without chemical analysis data – similar to Dioxin (Annex C) strategies
- More chemicals brought into the domestic market, and therefore chemical management systems need to be established