

# Stockholm Convention

10<sup>th</sup>  
ANNIVERSARY



Stockholm at 10:  
Chemical Challenges, Sustainable Solutions  
2001-2011

# Overview of the ammendments to the Convention and their implications for implementation



National workshop on Stockholm Convention  
Yerevan - Armenia, 26-27 May 2011



## THIS PRESENTATION

- The Stockholm Convention
- Listing of 9 new POPs in Annexes A, B and C of the Convention
- Registering exemptions
- Steps to be taken by Parties
- Overview of the 10 new POPs and main challenges

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# THE STOCKHOLM CONVENTION



## WHAT DOES THE CONVENTION AIM AT?

Protecting human health and the environment from persistent organic pollutants



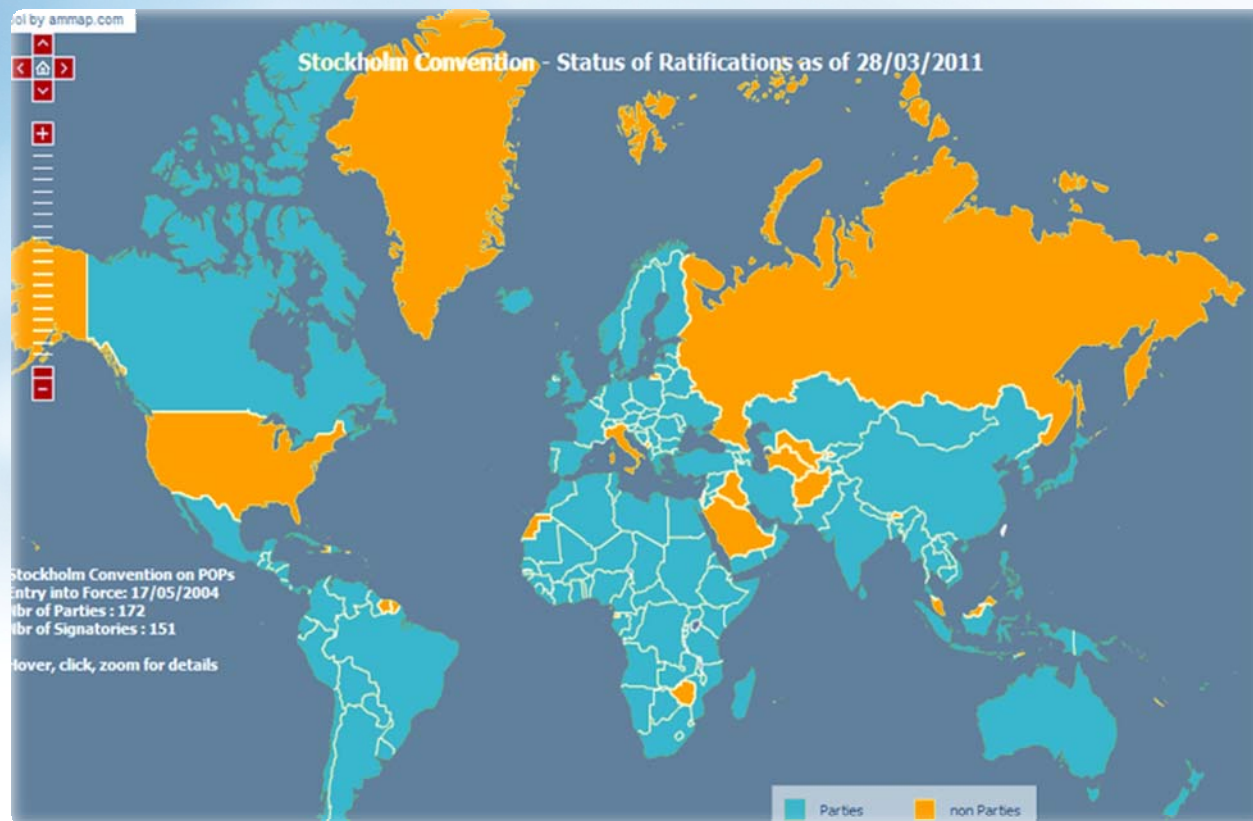
# KEY FACTS

- 
- Adopted on **22 May 2001**
  - Entered into force on **17 May 2004**
  - 173 Parties to date
  - **5 COPs** have already been convened:
    - COP-1, May 2005, Punta del Este, Uruguay
    - COP-2, Geneva, Switzerland, May 2006
    - COP-3, Dakar, Senegal, May 2007
    - COP-4, Geneva, Switzerland, May 2009:
      - Amended annexes A, B and C to include 9 new chemicals
    - COP-5, Geneva, Switzerland, May 2011:
      - Amended annexe A to include 1 new chemical



# PARTIES TO THE CONVENTION

As of May 2011



# HOW DOES IT WORK?

**Eliminate or restrict** the production, use, import and export of POPs

Reduce releases from **unintentional POP** production

Promote **BAT/BEP** to reduce POP emissions

Eliminate POPs **stockpiles** and **wastes**

Target additional **new POPs** for action

Mechanism for **financial and technical assistance**

Information exchange by **Clearing House Mechanism**



# HOW DOES IT WORK?

## Annex A: Elimination

- Elimination of production and use of all intentionally produced POPs

## Annex B: Restriction

- Restrict production and use in accordance with the provisions of that Annex

## Annex C: Unintentional Production

- “...Continuing minimization and, where feasible, ultimate elimination of the total releases of unintentional POPs”



# POPS REVIEW COMMITTEE (POPRC)

- ❑ Subsidiary body to the Convention that meets annually;
- ❑ 31 government designated experts;
- ❑ Scientific review of proposals for listing new chemicals, in accordance with Article 8:
  - ❑ Recommendations on listing to COP
  - ❑ COP makes final decision
- ❑ Advisory role on scientific issues related to implementation of the Convention, e.g. alternatives, toxic interactions



# THE INITIAL 12 POPS



## Annex A (Elimination)

● Aldrin ● Chlordane ● Dieldrin ● Endrin ● Heptachlor  
▲ ● Hexachlorobenzene ● Mirex ▲ Polychlorinated biphenyls  
● Toxaphene

## Annex B (Restriction)

● DDT

## Annex C (Unintentional production)

■ Hexachlorobenzene ■■ Polychlorinated biphenyls  
■ Polychlorinated dibenzo-*p*-dioxins and dibenzofurans  
(PCDD/PCDF)

● Pesticides ▲ Industrial chemicals ■ By-products

# THE NEW 9 POPS LISTED IN 2009



## Annex A (Elimination)

- Alpha hexachlorocyclohexane ●■ Beta hexachlorocyclohexane
- Chlordane ▲ Hexabromobiphenyl ▲ Hexabromodiphenyl ether and heptabromodiphenyl ether ● Lindane ▲ Pentachlorobenzene
- ▲ Tetrabromodiphenyl ether and pentabromodiphenyl ether

## Annex B (Restriction)

- ▲ Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride

## Annex C (Unintentional production)

- Pentachlorobenzene

● Pesticides ▲ Industrial chemicals ■ By-products

# NEW POP LISTED AT COP5



Endosulfan, a pesticide, added to Annex A  
in April 2011

# ENTRY INTO FORCE OF AMENDMENTS

**Amendments of the annexes made in 2009 entered into force on:**


→ 26 August 2010

## **Procedure:**

**Opt-out (Non-acceptance):** Parties not accepting adoption of amendments should inform depositary within one year → *Article 22*

**Opt-in (if declared upon ratification):** A country upon becoming a Party can declare desire to have entry into force of any amendments to Annexes A, B and C only when it deposits its instrument of ratification, accession, approval or acceptance → *Article 25*





**ACTIONS TO BE  
CONSIDERED BY PARTIES  
ONCE THE AMENDMENTS  
ENTER INTO FORCE**

# NECESSARY ACTIONS AFTER LISTING

## Review and update NIPs → Article 7

- Assess situation in consultation with national stakeholders

## Control measures → Articles 3 and 4

- Take legal/administrative measures to prohibit/ restrict/ control trade, production, use and disposal
- Notify Secretariat to register for specific exemptions and acceptable purposes

## Action plan for unintentional POPs → Article 5

- Develop and implement an action plan (as part of NIP)
- Promote BAT and BEP to reduce release



# NECESSARY ACTIONS AFTER LISTING

## Stockpiles and wastes → Article 6

- Identify stockpiles of POPs, or products and wastes containing POPs
- Manage stockpiles in environmentally sound manner

## Reporting to the Secretariat → Article 15

- Measures it has taken to implement the Convention
- Statistical data on production, import and export

## Include new chemical in the programme for the effectiveness evaluation → Article 16



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## **SPECIFIC EXEMPTIONS AND ACCEPTABLE PURPOSES**

# SPECIFIC EXEMPTIONS

Exemptions available for in accordance with Article 4

## Annex A – Elimination

- May be listed with **specific exemptions**
  - Exemption open for **5 years**
  - When all registrations have expired, no new registrations possible for a given exemption
  - Exemptions may be extended by the COP

## Annex B – Restriction

May be listed with **specific exemptions** and **acceptable purpose**

Specific exemptions: similar to Annex A

Acceptable purpose: need to register but **no deadline**, for purpose that has no alternatives and the use is critical



# SPECIFIC EXEMPTIONS AND ACCEPTABLE PURPOSES: WHY???

Countries may require a **transition period** to **eliminate reliance** on the POPs. Alternatives may be:

- Technically less feasible
  - Not cost effective, less efficacy
  - Not easily accessible
  - Associated with unknown risks
- **Certain POPs may:**
    - Not have effective alternatives immediately available
    - Be **critical** and **essential** from socio-economic, health or environmental perspectives



# REGISTER OF EXEMPTIONS



Stockholm Convention  
on persistent organic  
pollutants (POPs)

[Meetings](#) | [Documents](#) | [Contact](#)



CONVENTION

PROGRAMMES

COUNTRIES

SECRETARIAT

F

Exemptions

Overview

Decisions & Recommendations

Register of Specific Exemptions

DDT Register

PFOS and PFOSF Register

Articles in use

Closed-system site-limited production/use

New POPs

Unintentional POPs

BAT/BEP

ToolKit

DDT

PCBs

Waste & Stockpiles

Exemptions

Global Monitoring Plan

NIPs

Reporting

Regional Centres

Technical Assistance

Financial Mechanism

Effectiveness Evaluation

ns ▶ Register of Specific Exemptions

Register of Specific Exemptions

4 of the Convention, the Register is established for the purpose of Annex A or Annex B.

the Parties, pursuant to Article 4 of the Convention and by decision specific exemptions, with the exception of polychlorinated biphenyl or the persistent organic pollutants listed in Annex A or B of the Convention, no Parties registered for the specific exemptions listed in Annex exemption listed in Annex new registrations may be

Overview

Decisions & Recommendations

Register of Specific Exemptions

Registers of Acceptable Purposes

Articles in use

Closed-system site-limited notification

Also, in accordance with paragraph 4 of Article 22, the amendment a declaration regarding the amendment to those Annexes in

DDT Register

PFOS and PFOSF

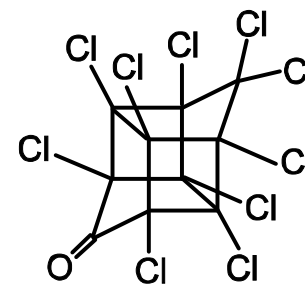


WHICH ARE THE NEW CHEMICALS

A stylized graphic in the top-left corner featuring a bright orange sun partially obscured by a blue and white globe, with several translucent bubbles floating around them.

# PESTICIDES

# Chlordecone



**Past use:** Agricultural pesticide (banana plantation)  
Used in 1966-1975 in the USA for ant and roach.  
Also known as « Kepon ».  
Properties similar to Mirex.

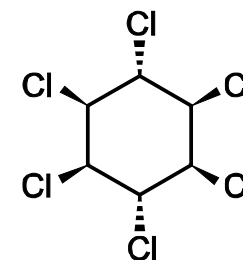
**Currently:** No production and use reported.  
The French island of Martinique is heavily contaminated with chlordecone.

**Alternatives:** Available

- Listed in: Annex A (Elimination)
- Production: No exemption
- Use: No exemption



# Lindane



**Past use:** About 600,000 tons of lindane was used globally 1950-2000 as pesticide and veterinary and human applications

**Currently:** Some countries are still known to produce or use lindane (e.g. for seed dressing, control of termites, head lice, etc)

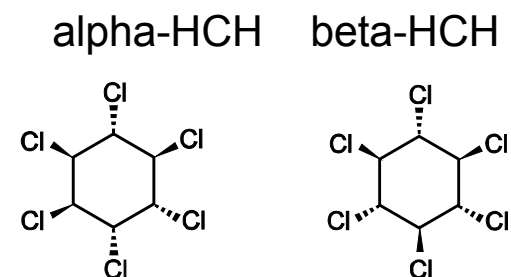
**Alternatives:** Exists but not readily available in some countries especially for control of head lice and scabies

- Listed in: Annex A (Elimination)
- Production: No exemption
- Use: Specific exemption: Human health pharmaceutical for control of head lice and scabies as second line treatment
- Possible additional control measures:
  - Limiting the package size; appropriate label;
  - Protecting vulnerable groups;
  - Outreach and awareness; promoting alternatives



# Alpha-Hexachlorohexane

# Beta-Hexachlorohexane



**Past use:** High-volume by-products of lindane. The production of one ton of lindane generates approximately up to 8 tons of alpha- and beta-HCH.

**Currently:** Large stockpiles of alpha- and beta-HCH exist.

**Alternatives:** As there is no commercial use of alpha- and beta-HCH, alternatives are not needed.

→ Listed in **Annex A (Elimination)**

→ Production: **No exemption**

→ Use: **No exemption**

(No production allowed for alpha- and beta-HCH because there is no exemption for production of lindane is allowed.)



# THE NEWEST POP: ENDOSULFAN

**Past use:** insecticide, wood preservative, veterinary insecticide

**Currently:** Broad range insecticide in agriculture

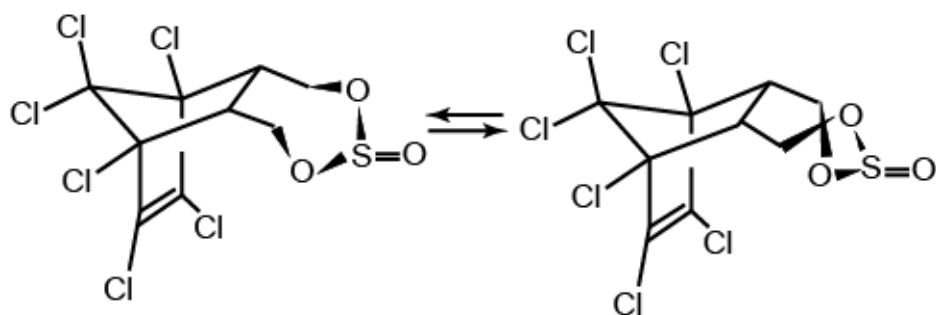
**Alternatives:** Available in many geographical situations;  
continued use required during phase-in of alternatives  
in some countries; may be difficult to replace  
endosulfan for specific crop-pest complexes;



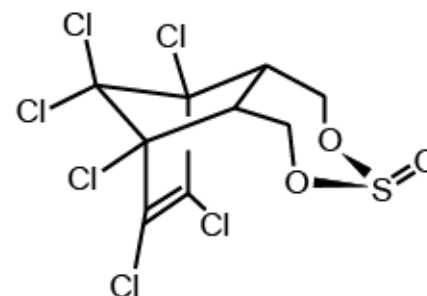
# ENDOSULFAN

## Technical endosulfan (CAS No: 115-29-7)

alpha-endosulfan  
(CAS No: 959-98-8)



beta-endosulfan  
(CAS No: 33213-65-9)



- Listed in: Annex A (Elimination)
- Production: exemptions for Parties listed in Register of specific exemptions
- Use: exemptions for crop-pest complexes as listed in accordance with the provisions of part VI of Annex A



# GLOBAL ISSUE FOR POPS PESTICIDES: *Obsolete Stockpiles*

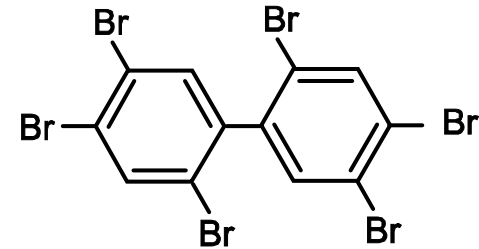




# INDUSTRIAL CHEMICALS

- FLAME RETARDANTS
- PFOS, its salts & PFOS-F

# Hexabromobiphenyl



**Past use:** Flame retardants. Added to plastics used in products such as home electrical appliances, textiles, plastic foams, laptop cabinets, etc. to make them difficult to burn.

**Currently:** No production and use reported. Other polybrominated biphenyls are also controlled by RoHS Directive by EU.

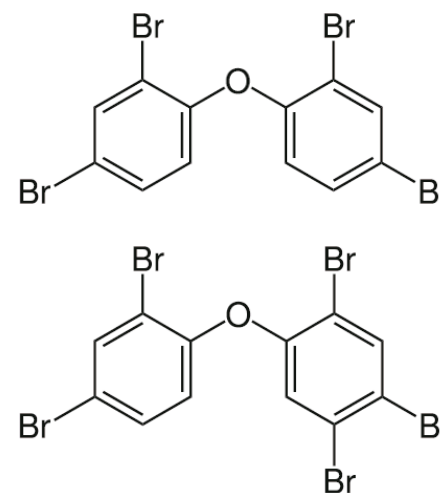
**Alternatives:** Available

- Listed in: Annex A (Elimination)
- Production: No exemption
- Use: No exemption



# Tetrabromodiphenyl ether and pentabromodiphenyl ether

Main components of  
“Commercial mixture of pentabromodiphenyl ether”

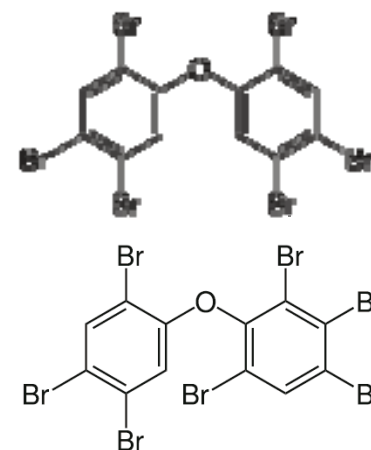


- Past use:** Most commonly used as a flame retardant in flexible polyurethane foam (PUR); also used in printed circuit boards.
- Currently:** No current production in Europe, Japan, Canada, Australia and the US; however, it is possible that production continues elsewhere in the world.
- Alternatives:** available

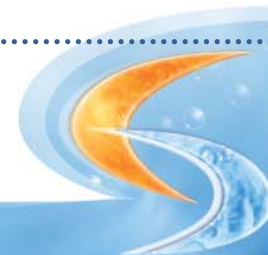


# Hexabromodiphenyl ether and heptabromodiphenyl ether

Main components of  
“Commercial mixture of octabromodiphenyl ether



- Past use:** Most commonly used as a flame retardant in acrylonitrilebutadiene styrene (ABS) plastic. Manufacture of computers, home electronics, office equipment.
- Currently:** Ceased in Europe, Japan, Canada, Australia and the US; production may continue elsewhere in the world.
- Alternatives:** available and already used in many developed countries



# BROMODIPHENYL ETHERS

## Listed in Annex A (Elimination)

Countries must take measures to eliminate production and use

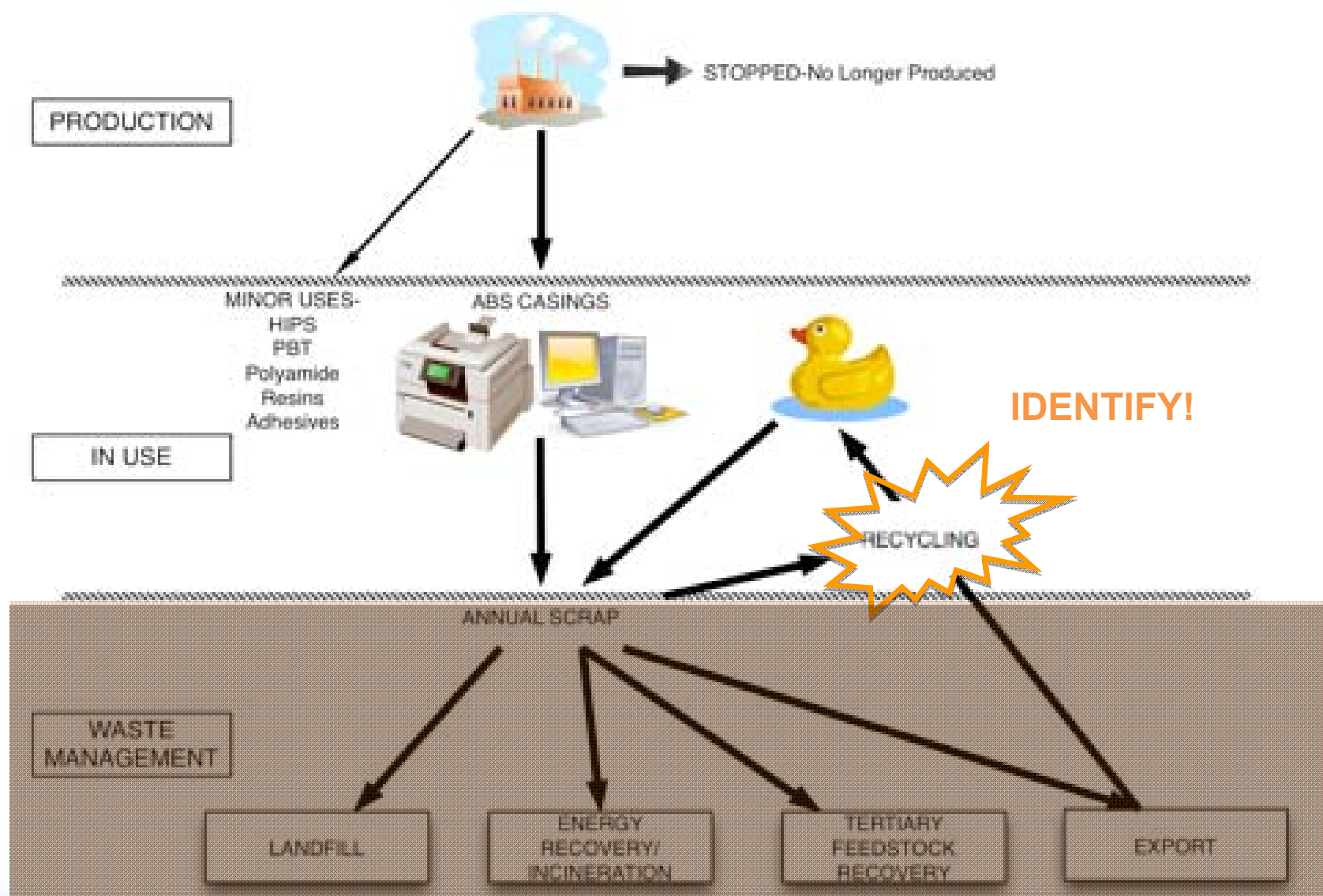
**Exemption for production:** none

### **Exemption for use:**

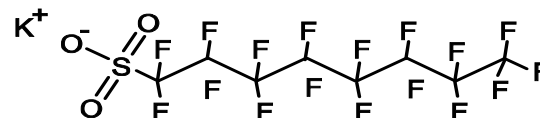
- ❖ Countries may allow **recycling** of articles that may contain the chemicals, and the use and final disposal of articles manufactured from recycled materials that may contain the chemicals
- ❖ Recycling and final disposal must be carried out in an **environmentally sound manner** and should not lead to the recovery of BDEs for their reuse



# ELIMINATING BDES: MAIN CHALLENGES

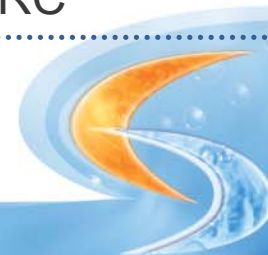


## Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF)

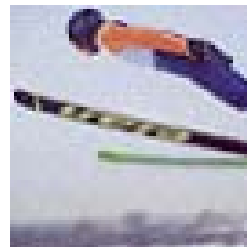
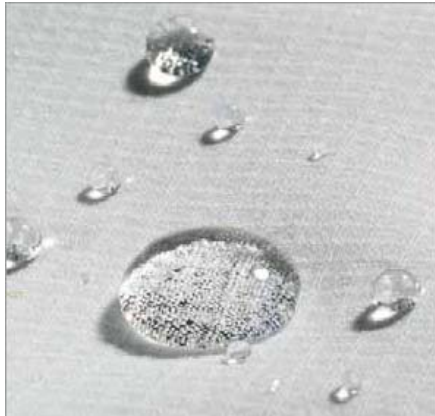


- Past use:** Surfactant, water and fat repellent  
PFOS is both intentionally produced and an unintended degradation product of PFOS-related substances (PFOS precursors). Examples of use include: electronic appliances, fire-fighting foams, water proof for textile, leather, etc.
- Currently:** PFOS is still produced and used in several countries.
- Alternatives:** Available for some types of use but no known technically feasible alternatives for some applications e.g. semi-conductor, photo imaging, aviation hydraulic fluids  
Guidance: in preparation by POPRC

→ Listed in Annex B (Restriction) with Specific exemptions and Acceptable purposes



# SOME PAST/CURRENT USES OF PFOS

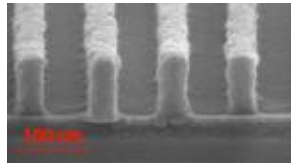


travis jon allison on flickr



# PFOS USE: ACCEPTABLE PURPOSES (NO ALTERNATIVES)

- Photo imaging,
- Photo resist and anti-reflective coatings for semi-conductors,



- Etching agent for compound semi-conductors and ceramic filters,



- Aviation hydraulic fluids,
- Metal plating only in closed-loop systems,
- Certain medical devices (e.g. ETFE layers, radio-opaque ETFE, in vitro diagnostic medical devices, CCD color filters),



- Fire fighting foam,
- Insect baits for control of leaf-cutting ants.

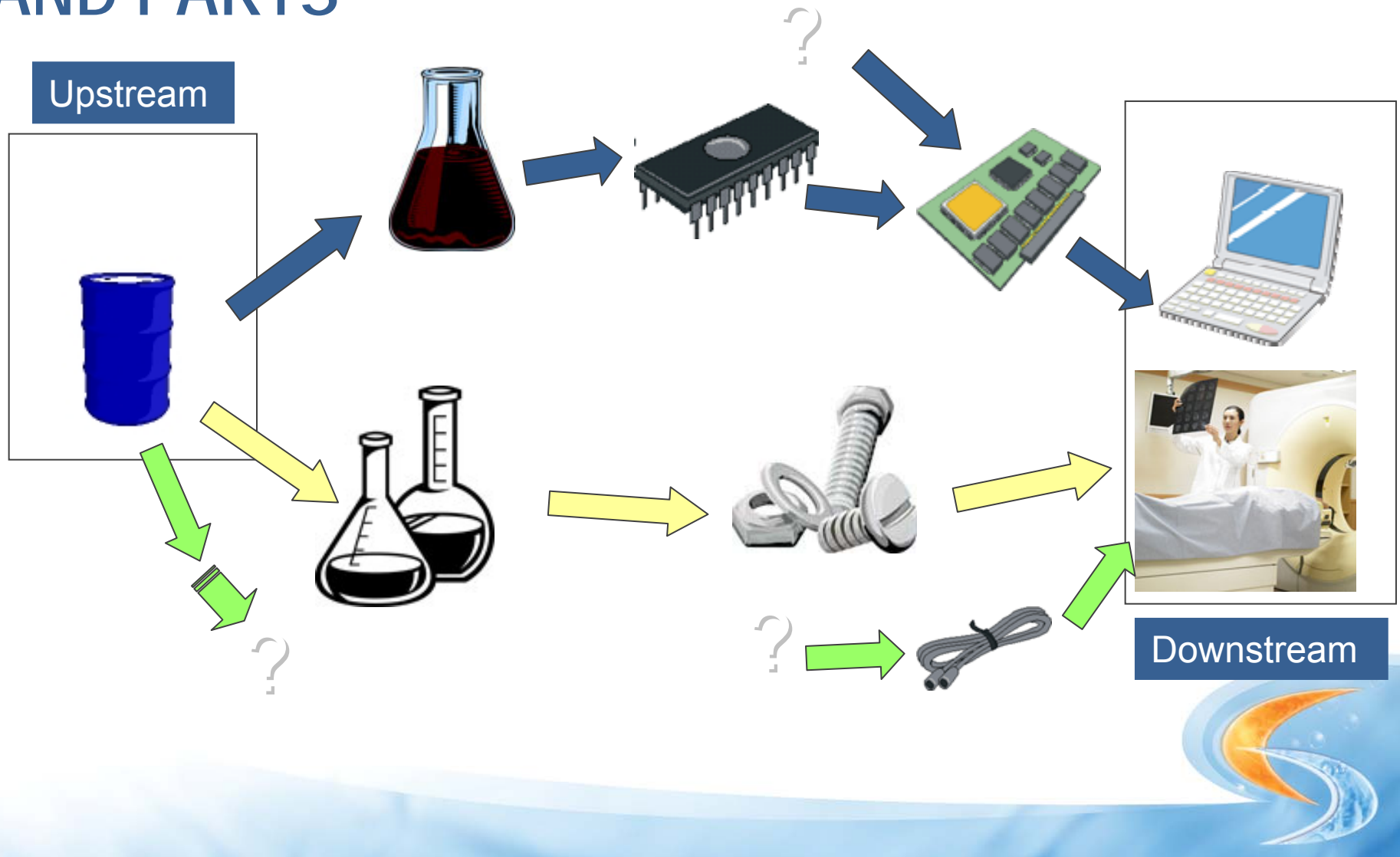


# PFOS USE: SPECIFIC EXEMPTION

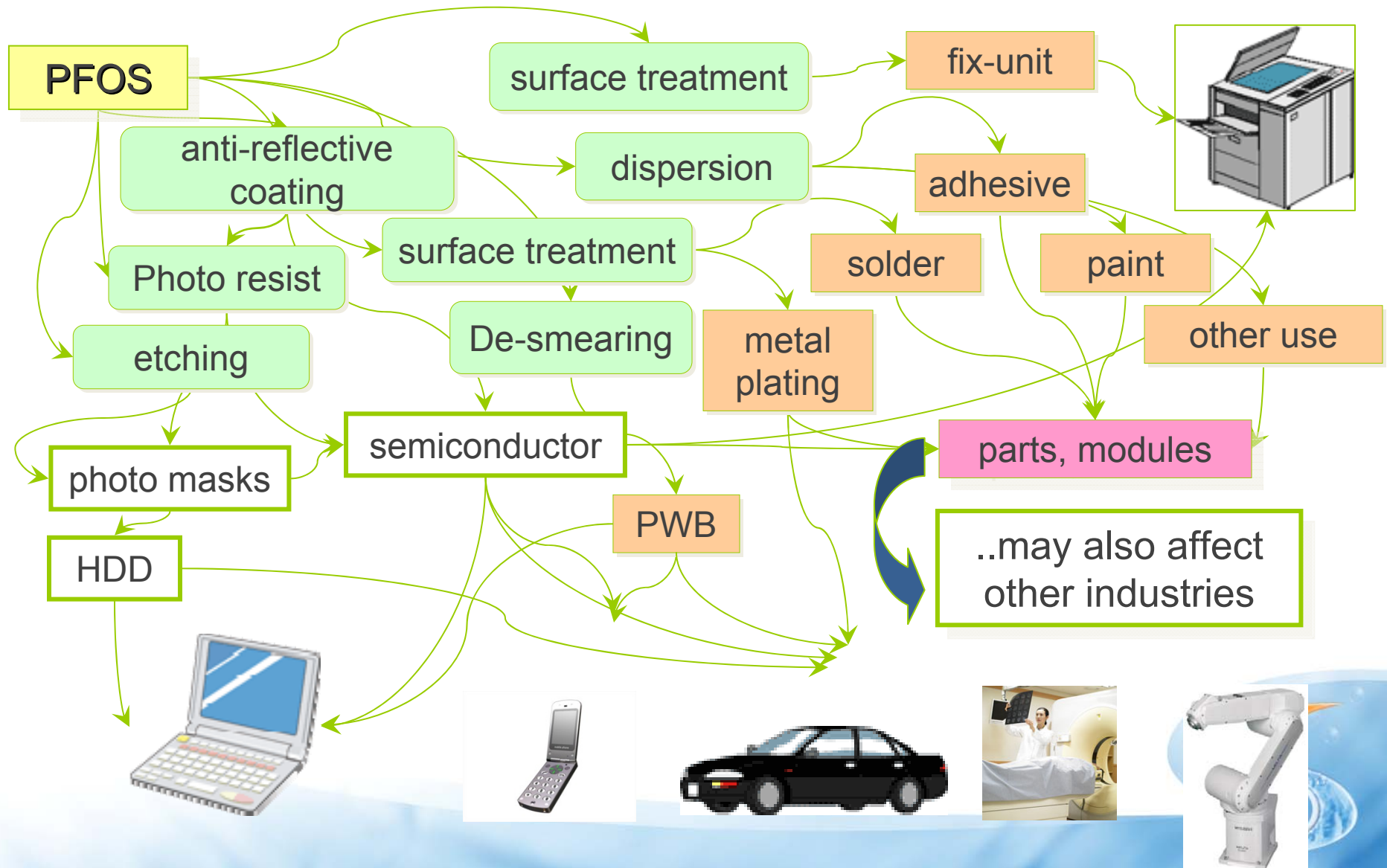
- Photo masks in the semiconductor and LCD industries,
- Hard metal plating,
- Decorative metal plating,
- Electric and electronic parts for some color printers and color copy machines,
- Insecticides for control of red imported fire ants and termites,
- Chemically driven oil production,
- Carpets,
- Leather and apparel,
- Textiles and upholstery,
- Paper and packaging,
- Coatings and coating additives,
- Rubber and plastics.



# CHALLENGE: PFOS IS USED IN NUMEROUS PROCESSES AND PARTS



# CHALLENGE: LONG SUPPLY-CHAIN, INVOLVE MANY PRODUCERS/USERS



# RESOURCES ON BDES AND PFOS

- ❖ Technical review of the implications of recycling commercial pentabromodiphenyl ether and commercial octabromodiphenyl ether (UNEP/POPS/POPRC.6/2/Rev.1)
- ❖ Supporting document for the draft technical paper developed in accordance with the work programmes on new persistent organic pollutants as adopted by the Conference of the Parties (UNEP/POPS/POPRC.6/INF/6)
- ❖ Recommendations on the elimination of brominated diphenyl ethers from the waste stream and on risk reduction for perfluorooctane sulfonic acid and its salts and perfluorooctane sulfonyl fluoride (UNEP/POPS/COP.5/15)
- ❖ Guidance on feasible flame-retardant alternatives to commercial pentabromodiphenyl ether (UNEP/POPS/COP.4/INF/24)
- ❖ Guidance on alternatives to perfluorooctane sulfonate and its derivatives (UNEP/POPS/POPRC.6/13/Add.3)



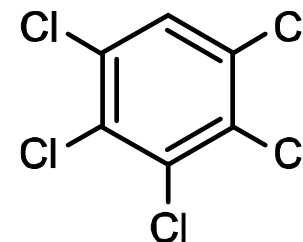
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# POPS FROM UNINTENTIONAL PRODUCTION

# Pentachlorobenzene



**Past use:** Component of PCB products, fungicide, flame retardant.

**Currently:** Possible continuous use as intermediate for production of quintozone (pentachloronitrobenzene: fungicide).  
Unintentional production during combustion, thermal and industrial processes  
Impurities in chlorinated products e.g. solvents, pesticides.

**Alternatives:** Available

→ **Listed in:** Annex A (Elimination) and Annex C (Unintentional production)

→ **Production:** No exemption

→ **Use:** No exemption



# CHALLENGE FOR PECB : ELIMINATING RELEASES FROM UNINTENTIONAL PRODUCTION (ARTICLE 5)

## ❖ Release inventory:

### Point sources:

Combustion and thermal process (e.g. municipal and hazardous waste incineration) and industrial process (e.g. metal ore production)

### Diffuse sources:

Impurities in products such as solvents, pesticides, wood preservatives, barrel burning of wastes, open fire place, accidental fire, forest burning

## ❖ Apply measure for release reduction or source elimination:

### Point sources:

- Apply BAT/BEP (correlation with PCDD/F formation by combustion; therefore same BAT/BEP can be applied for reduction of PeCB)
- Emissions factor for PeCB under development

### Diffuse sources:

Prevent through awareness raising and legislation



# SUMMARY

- Total of 10 new POPs added to the Stockholm Convention
  - 5 pesticides:
    - main challenge is disposal of obsolete stockpiles
  - 4 industrial chemicals:
    - Widespread distribution in products & articles in use
    - Contamination of recycling streams
    - Environmentally sound disposal of wastes
  - 1 chemical from unintentional production (PeCB):
    - Reducing releases from point and diffuse sources

Next step:

- Review and update of national implementation plan



**THANK YOU FOR YOUR  
ATTENTION!**



**More information:  
[www.pops.int](http://www.pops.int)**