CHEMIE ŽIVOTNÍHO PROSTŘEDÍ IV

Vybrané typy environmentálních polutantů

(04/05)

Persistentní organické polutanty (POPs)
Persistentní, bioakumulativní a toxické látky (PBTs)
Persistentní toxické látky PTS
Mezinárodní úmluvy

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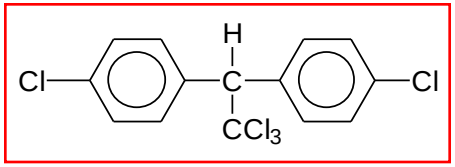
Stockholm Convention

Stockholm, Sweden, May 22-23, 2001

Persistent Toxic Substances

- Persistent
- Bio-accumulative
- Toxic
- Transboundary movement
- POPs a sub-group



Stockholm Convention

Persistent

- Resists degradation in the environment
- Other chemicals, even though degrading faster in the environment, are persistent due to continuous release

Stockholm Convention

Bio-accumulative

- Concentrates in fatty tissue (lipophilic)
- Bio-accummulation factor in animals dependent on the log K_{ow} – a measure of the affinity of chemicals to lipids
- Chemicals to be included – log K_{ow} > 3 but molecular weight < 1 000 Daltons
- Chemical accummulates up the food chain


Damir Sagolj / Reuters

Stockholm Convention

Toxicity

- Chemicals show chronic toxicity properties including: developmental, reproductive, carcinogenic, immunotoxic and neurotoxic activities in humans and wildlife

- ADI values are compared to NOEL/LOEL values to establish risk from exposure

- Substances with acute toxicity and with continuous release/exposure to be considered

Stockholm Convention

Transboundary Movement

- Chemicals transported through erosion, flood plains, water, biota etc.

- Chemicals are semi-volatile
- Evaporate over warmer regions and condense in colder atmospheres

- Can affect regions where use is non-existent

The objective of the Stockholm Convention

The objective of the Stockholm Convention is to protect human health and the environment from persistent organic pollutants. It differentiates between three categories of POPs:

- **Intentionally produced POPs that are slated for elimination;**
- **Intentionally produced POPs are to be reduced and ultimately eliminated, except where there is a specified "acceptable purpose," such as disease vector control, or exempted usage, in which case the production and/or use of the substance is restricted; and**
- **POPs that are unintentionally produced as the result of human activity and which are slated for continued minimization and, where feasible, ultimate elimination of total releases derived from anthropogenic sources.**

www.pops.int

12 old Stockholm POPs

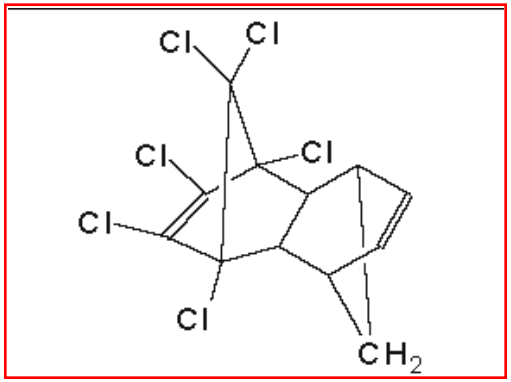
	Pesticide	Industrial Chemical	By-product
Aldrin	+		
Chlordane	+		
DDT	+		
Dieldrin	+		
Endrin	+		
Heptachlor	+		
Mirex	+		
Toxaphene	+		
Hexachlorobenzene	+	+	+
PCB		+	+
PCDD			+
PCDF			+

10 new Stockholm POPs

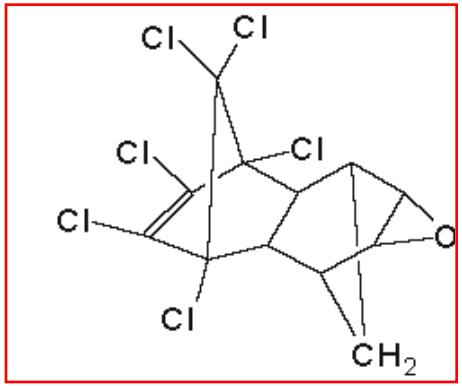
	Pesticide	Industrial Chemical	By-product
Chlordecone	+		
HBB		+	
α-HCH	+		+
β-HCH	+		+
γ-HCH	+	+	+
PeDBE		+	+
OCBDE		+	+
PFOS		+	
PeCBz	+	+	+
Endosulfan	+		

Old Stockholm POPs

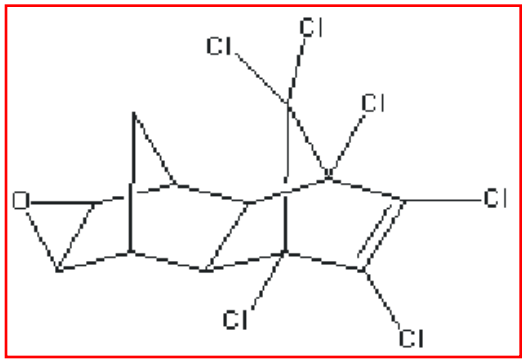
ALDRIN



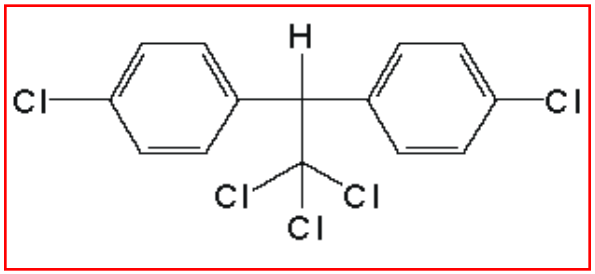
DIELDRIN



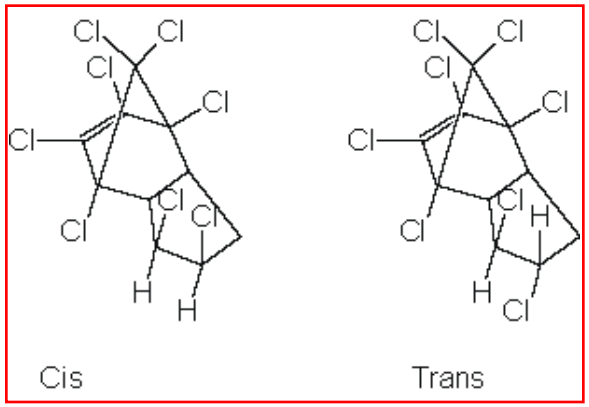
ENDRIN



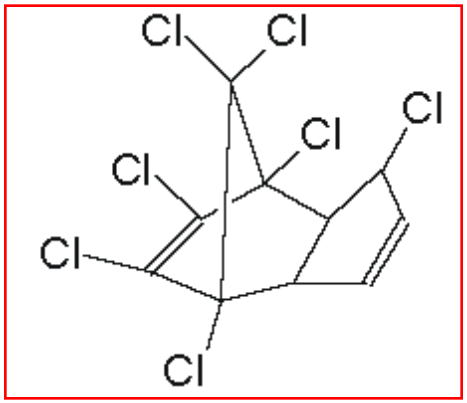
DDT



CHLORDAN

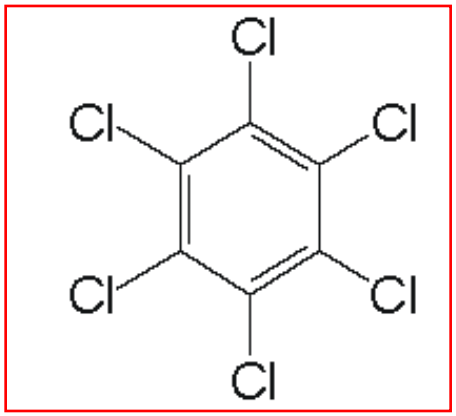


HEPTACHLOR

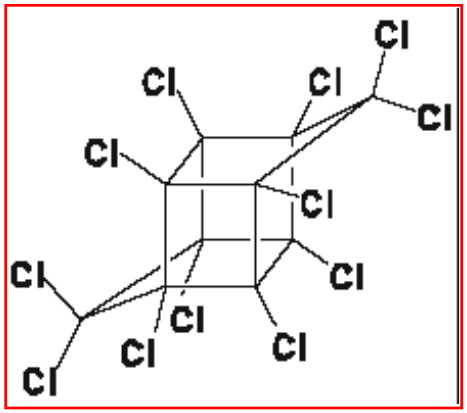


Old Stockholm POPs

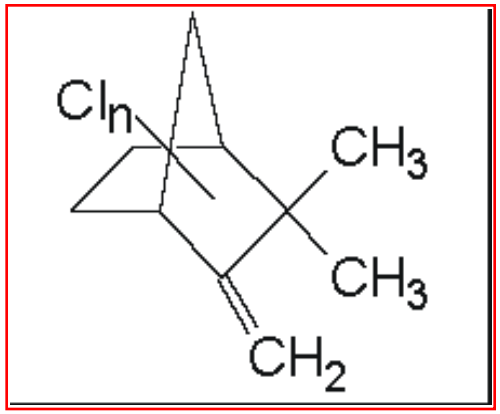
HCB



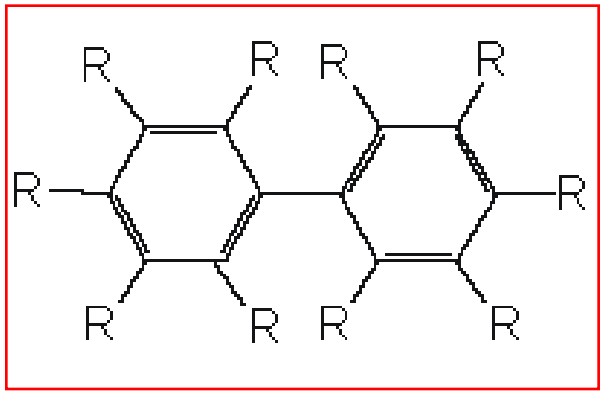
MIREX



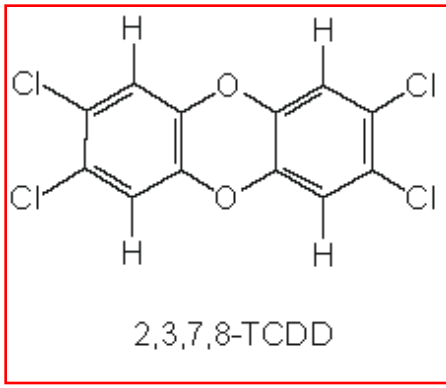
TOXAPHEN



PCBs

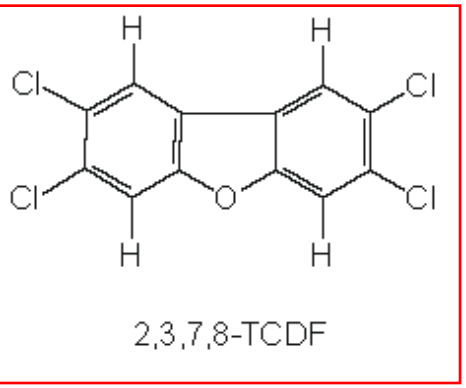


PCDDs



2,3,7,8-TCDD

PCDFs



2,3,7,8-TCDF

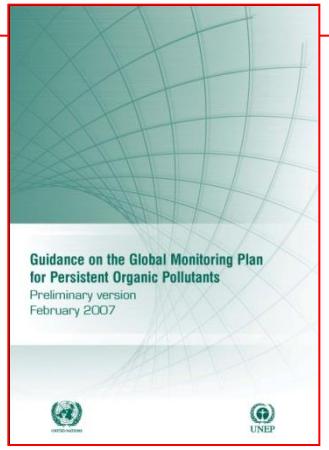
Stockholm Convention

POPs





Nástroje Stockholmské úmluvy



Národní POPs Inventura ČR – 2002 – 2009

Národní implementační plán SÚ v ČR - 2004

Hodnocení účinnosti opatření SÚ – Globální POPs monitoring

Globální a regionální monitoring POPs ve volném ovzduší (aktivní a pasivní vzorkování; mateřské mléko

monet

Národní síť monitoringu POPs ve volném ovzduší ČR – MONET-CZ, MONET Region + MONET-Europe, MONET-Africa

Národní a regionální POPs Centra pro implementaci závěrů SÚ na národní a regionální úrovni

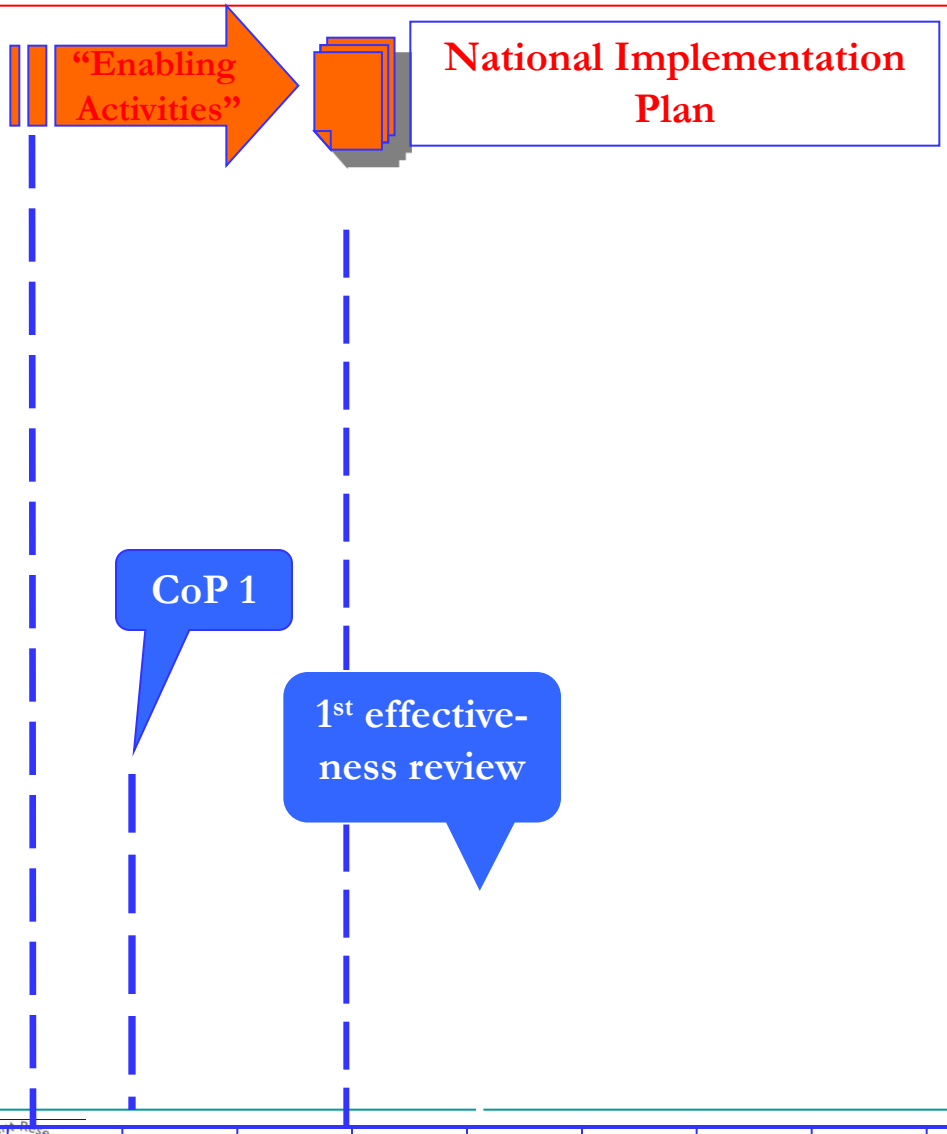
Národní centrum pro perzistentní organické polutanty

Stockholm Convention Regional centre for capacity building and transfer of technology in Central and Eastern European countries

POP Review Committee – hodnocení nových kandidátských POPs

Národní implementační plán

Příprava NIP – politický proces



Hlavní strategické cíle NIP

- eliminace vstupů POPs do prostředí a snížení expozice člověka těmito látkami;
- odstranění starých zátěží spojených s dřívější produkcí, používáním, distribucí a odstraněním POPs;
- nezbytně nutná je podpora dobudování zařízení ke sběru odpadů s obsahem POPs ev. dalších nebezpečných látek, kde tyto budou shromažďovány a skladovány environmentálně bezpečným způsobem do doby, než bude možné zajistit jejich odstranění s maximálně možným využitím existující sítě těchto zařízení;
- aplikace principů BAT/BEP (Best Available Techniques/ Best Environmental Practices) v rámci strategie rozvoje průmyslu v příštích letech;

Hlavní strategické cíle NIP

- vypracování komplexních plánů odstranění odpadů s obsahem POPs včetně zhodnocení dopadů různých variant na životní prostředí a zdraví lidské populace;
- získání dalších dat potřebných k objektivnímu zjištění velikosti zatížení POPs ve vybraných oblastech – zpracování inventur vstupů do všech složek životního prostředí, produktů a odpadů pro všechny látky na Seznamu Úmluvy a PAHs,
- optimalizace monitorovacích programů jednotlivých resortů s cílem realizovat úkoly dané Úmluvou.

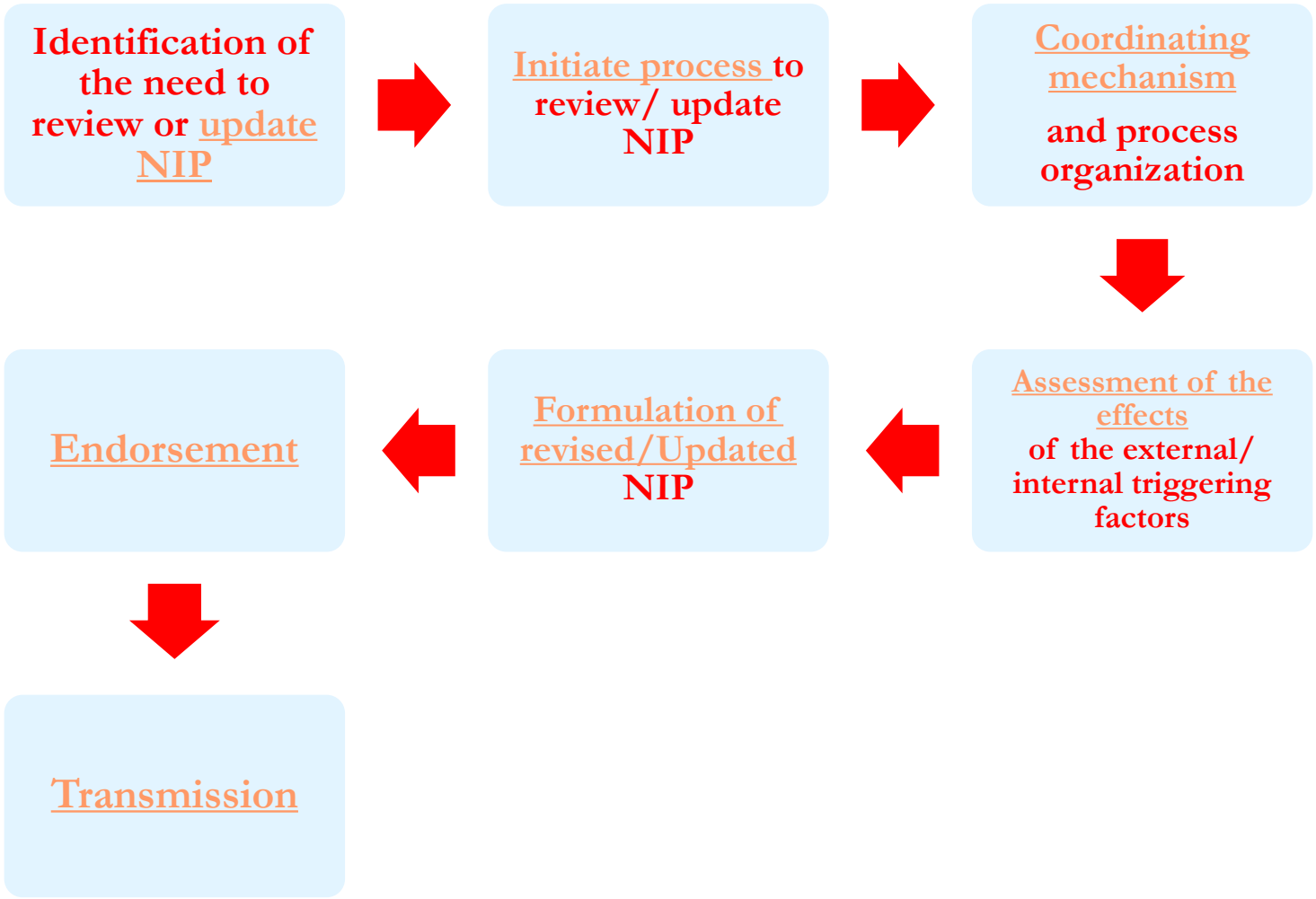
Časový plán implementace

- Distribuce Národního implementačního plánu všem zainteresovaným institucím po jeho vzetí vládou na vědomí.
- Vytvoření Národního POPs Centra a monitorovacího výboru implementace Úmluvy do 1 roku od vzetí Národního implementačního plánu vládou na vědomí.
- Splnění krátkodobých cílů stanovených Národním implementačním plánem do tří let od vzetí vládou na vědomí.
- Vyhodnocení plnění krátkodobých cílů a aktualizace Národního implementačního plánu do září 2009.
- Splnění dlouhodobých cílů stanovených Národním implementačním plánem do deseti let od vzetí plánu na vědomí.

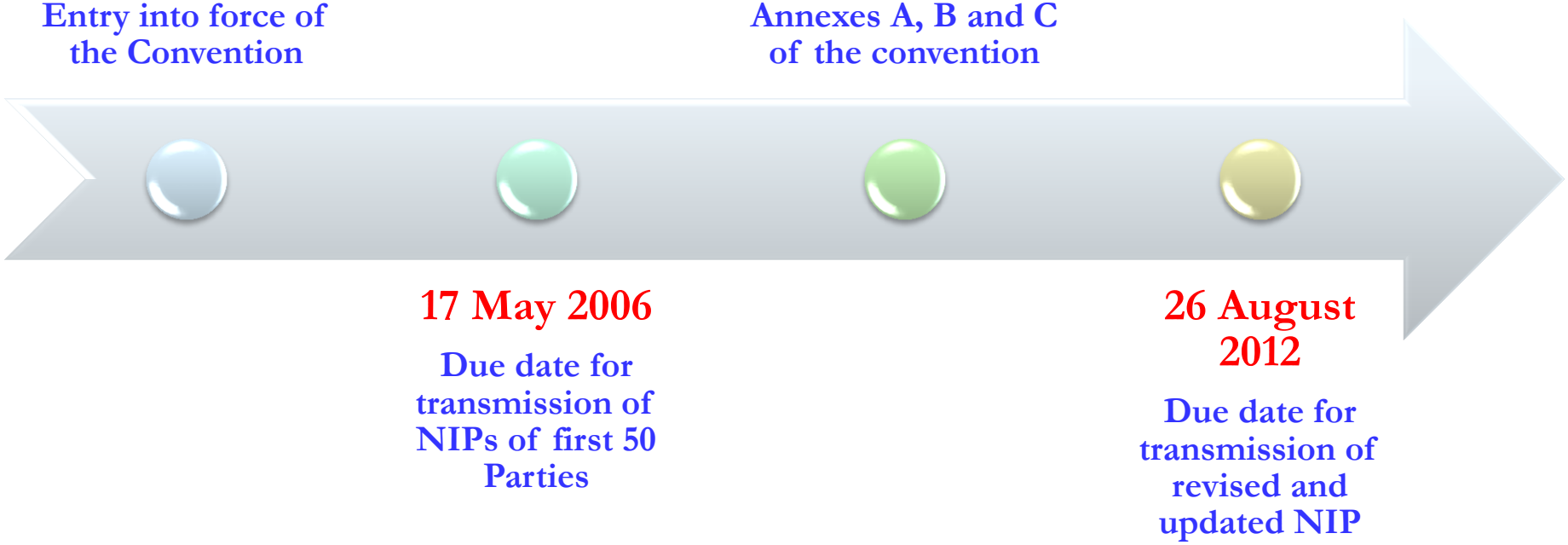
Národní POPs priority

- Destrukční kapacita
- Látky – PAHs, SCCPs, Br-
- Nové lokality
- Potraviny
- Vyhodnocování, práce s informacemi
- Preventivní činnost

Elaborated process for reviewing and updating NIP



Timeline for NIP review and update



Národní POPs inventura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Partners
GENASIS 1.0 - http://www.genasis.cz

Národní POPs Centrum

Národní POPs Centrum ČR (NC)

Založení NC je realizováno rámcovou smlouvou mezi MŽP a MU Brno.

Centrum je zaměřeno na realizaci úkolů NIP, implementaci SÚ a dalších úmluv souvisejících s chemickými látkami.

NC bude úzce spolupracovat s řadou předních pracovišť ČR a sítí externích expertů, jenž se podíleli na přípravě Národní POPs inventury a vytvoří tak vhodnou platformu pro realizaci NIP.

NC představuje odbornou základnu, jejímž cílem je přispět k porozumění problematice POPs v podmínkách ČR, informování a interpretaci problémů spojených s těmito látkami v naší zemi a zvýraznit skutečnost, že ČR má dostatek odborných kapacit, dat i informací pro seriózní a kvalifikovaný přístup k dané problematice.

Národní centrum pro perzistentní organické polutanty

Komise pro hodnocení nových POPs (POPs Review Committtee)

Persistent Organic Pollutants Review Committee (POPRC)

- Subsidiary body to the Convention, mandated to review proposals submitted by Parties for listing new chemicals in Annex A, B, or C.
- 31 government-designated members
- Terms of reference, conflict of interest procedure: SC-1/7,SC-1/8, SC-4/20

What are the 9 new POPs?

Annex A – Elimination:

Elimination of production and use of all intentionally produced POPs

Lindane*, alpha-HCH. beta-HCH, chlordecone, Hexabromobiphenyl, pentachlorobenzene, "tetra- and pentabromodiphenyl ether"*, "hexa- and hepta bromodiphenyl ether"*

**listed with use specific exemptions*

Annex B - Restriction:

Restrict production and use in accordance with the provisions

PFOS**

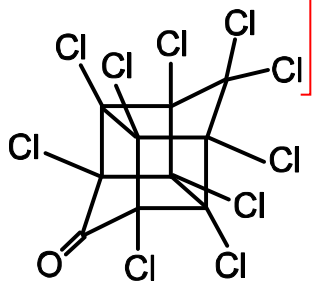
***listed with several specific exemptions and acceptable purposes for production and use*

Annex C - Unintentional Production:

"…Continuing minimization and, where feasible, ultimate elimination of the total releases of chemicals."

Pentachlorobenzene

1. Chlordecone



- Proposal: 2005, European Community
- Risk profile: UNEP/POPS/POPRC.2/17/Add.1
- Risk management evaluation: UNEP/POPS/POPRC.3/20/Add.1

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.

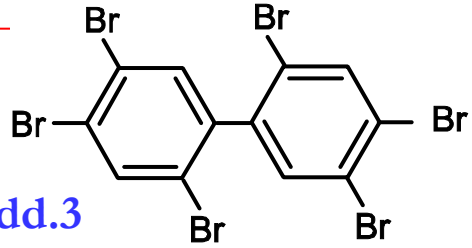
Alternatives: Available

→ Listed in: Annex A (Elimination)

→ Production: No exemption

→ Use: No exemption

2. Hexabromobiphenyl



- Proposal: 2005, European Community
- Risk profile: UNEP/POPS/POPRC.2/17/Add.3
- Risk management evaluation: UNEP/POPS/POPRC.3/20/Add.3

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.

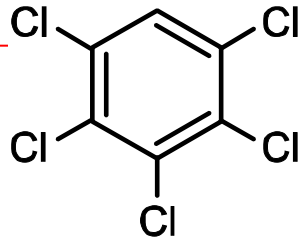
Alternatives: Available

→ Listed in: Annex A (Elimination)

→ Production: No exemption

→ Use: No exemption

3. Pentachlorobenzene



- Proposal: 2006, European Community
- Risk profile: UNEP/POPS/POPRC.3/20/Add.7
- Risk management evaluation:UNEP/POPS/POPRC.4/15/Add.1

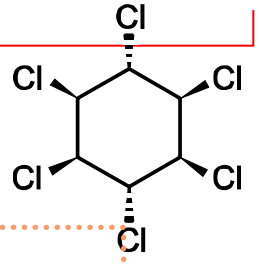
Past use: Component in PCB products, fungicide, flame retardant.

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

Alternatives: Available

- Listed in: Annex A (Elimination) and Annex C (Unintentional production)
- Production: No exemption
- Use: No exemption

4. Lindane



- Proposal: 2005, Mexico
- Risk profile: UNEP/POPS/POPRC.2/17/Add.4
- Risk management evaluation: UNEP/POPS/POPRC.3/20/Add.4

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

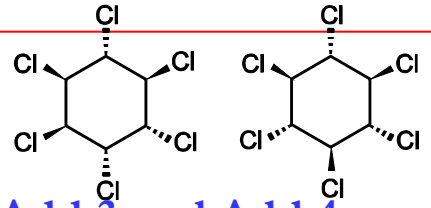
Currently: Some countries are still known to produce or use lindane (e.g. for seed dressing, control of termites, head lice, etc)

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

5. Alpha-HCH, 6. Beta-HCH

alpha-HCH beta-HCH



- Proposal: 2006, Mexico
- Risk profile: UNEP/POPS/POPRC.3/20/Add.8 and Add.9
- Risk management evaluation: UNEP/POPS/POPRC.4/15/Add.3 and Add.4

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.

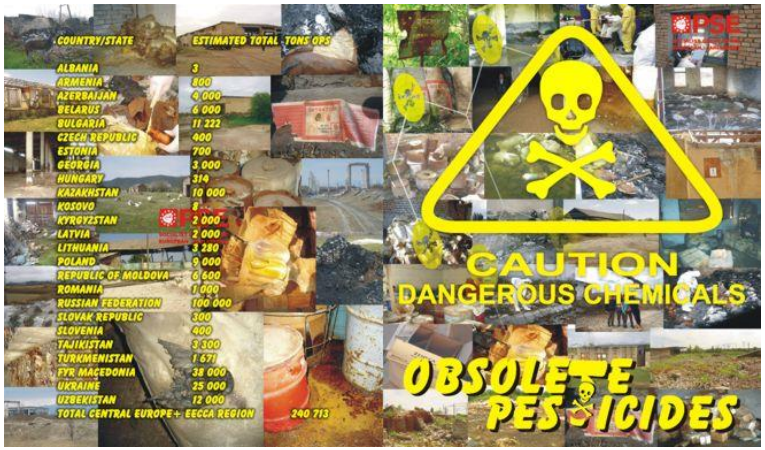
→ Listed in: Annex A (Elimination)

→ Production: No exemption

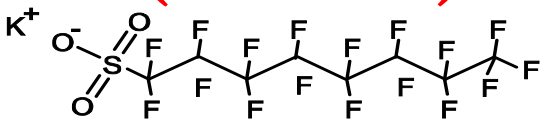
→ Use: No exemption

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

GLOBAL ISSUE:
Obsolete waste of alpha-, beta-HCH and lindane



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



- Proposal: 2005, Sweden
- Risk profile: UNEP/POPS/POPRC.2/17/Add.5
- Risk management evaluation: UNEP/POPS/POPRC.3/20/Add.5 and UNEP/POPS/POPRC.4/15/Add.6

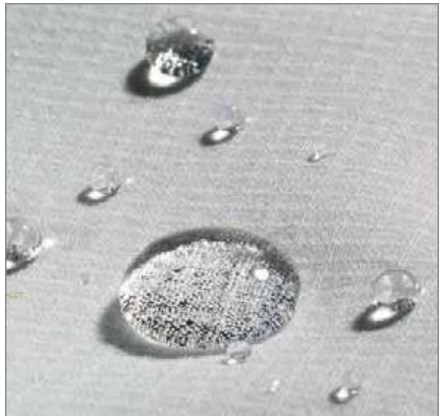
Past use: PFOS is both intentionally produced and an unintended degradation product of PFOS-related substances (PFOS precursors). Examples of use include: electronic appliances, fire-fighting foams, water proof for textile, leather, etc.

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

Uses of PFOS identified by the POPRC

1. Uses for which no alternatives are available

- Photo imaging, photo resist and semi-conductor, photo masks in the semiconductor and liquid crystal display (LCD) industries, aviation hydraulic fluids, certain medical devices

2. Uses for which alternatives would need to be phased in

- Metal plating, electric and electronic parts, ant baits for control of leaf-cutting ants, CCD color filters, chemically driven oil production

3. Uses for which alternatives are available in developed countries

- Firefighting foams, carpets, leather and apparel, textiles and upholstery, paper and packaging, coatings and coating additives, cleaning products, pesticide and insecticides, rubber and plastics

Difference between listing in Annex A and Annex B

Annex A – Elimination

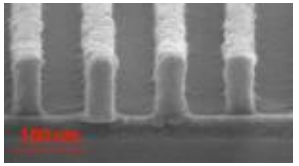
- May be listed with Specific exemptions
  - Parties need to register (exception: PCBs)
  - Exemption open for 5 years from the date of entry into force
  - When all registrations have expired, no new registrations possible for a given exemption

Annex B – Restriction

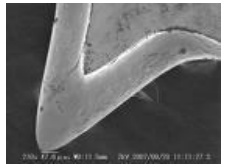
- Listed with specific exemptions and acceptable purpose
  - Specific exemptions: similar to Annex A
  - Acceptable purpose: need to register but no deadline, for purpose that has no alternatives, and the use is critical
- DDT is listed with 'acceptable purpose' production and use for vector control

PFOS Use: Acceptable purposes

- 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 purposes

- 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,

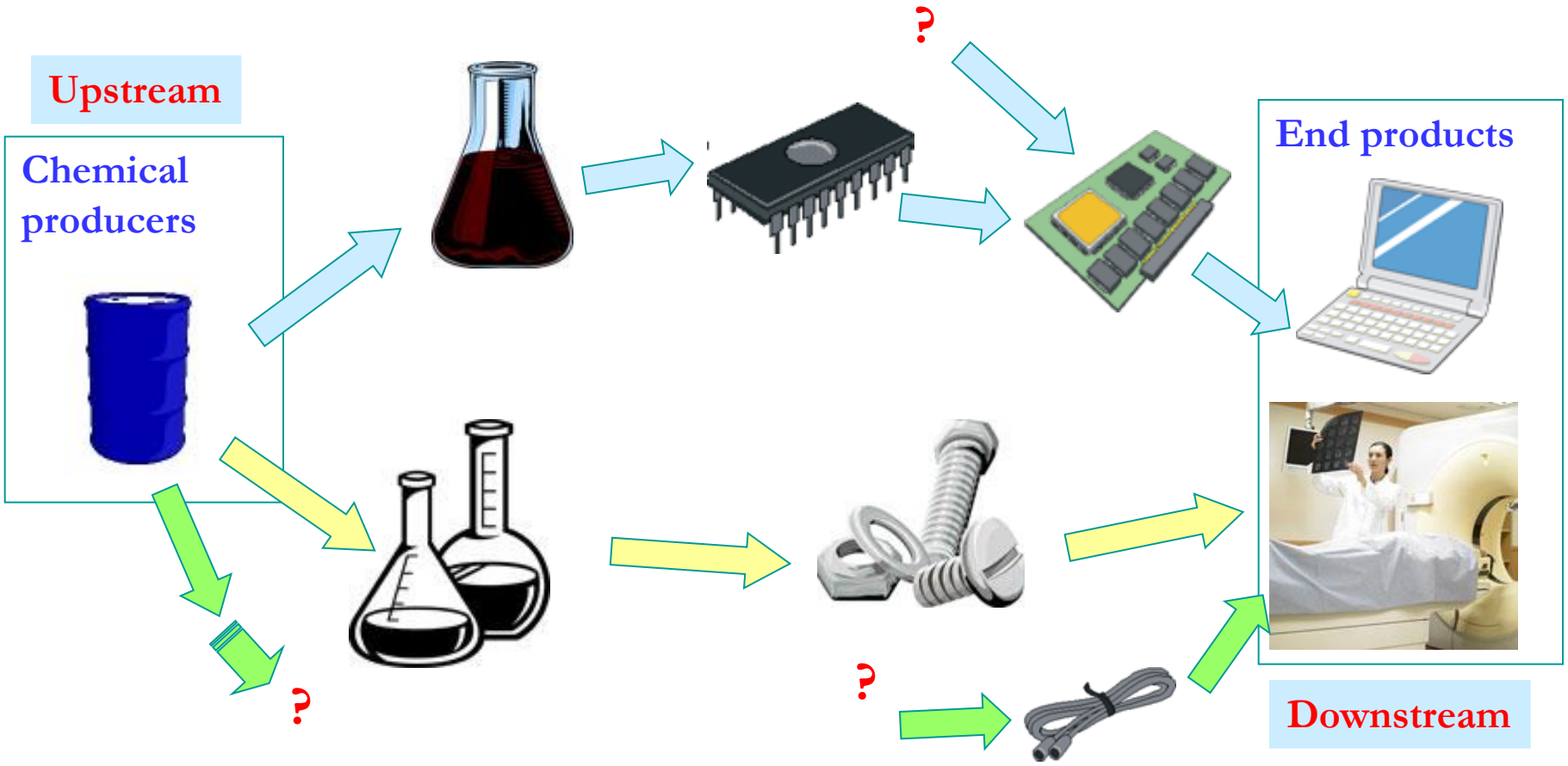
- Chemically driven oil production,

- Carpets,
- Leather and apparel,

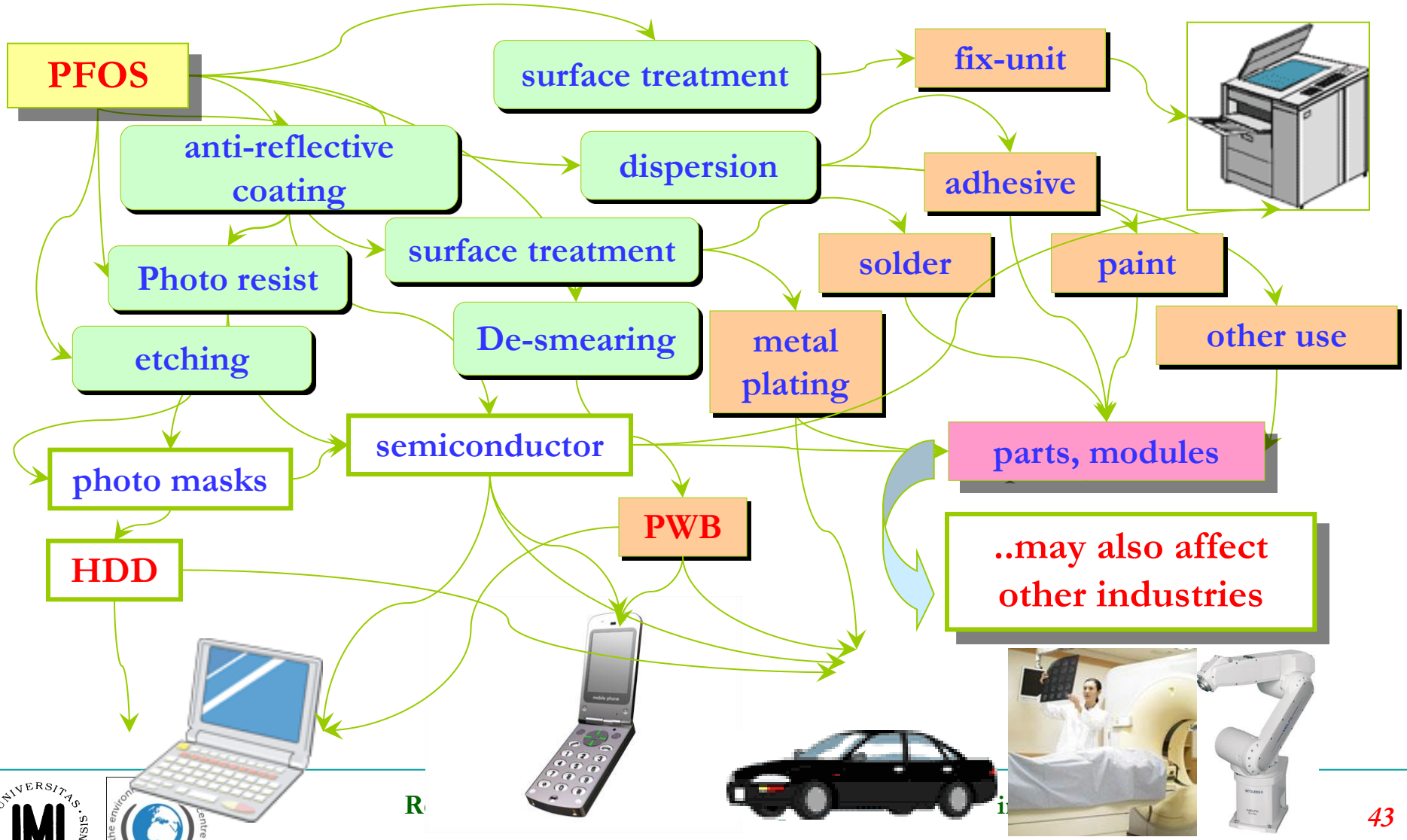
- Textiles and upholstery,
- Paper and packaging,

- Coatings and coating additives,
- Rubber and plastics.

Special care needed for industrial chemicals like PFOS because: Used in numerous processes and parts



Special care needed for industrial chemicals like PFOS because: Long supply-chain, involve many producers/ users

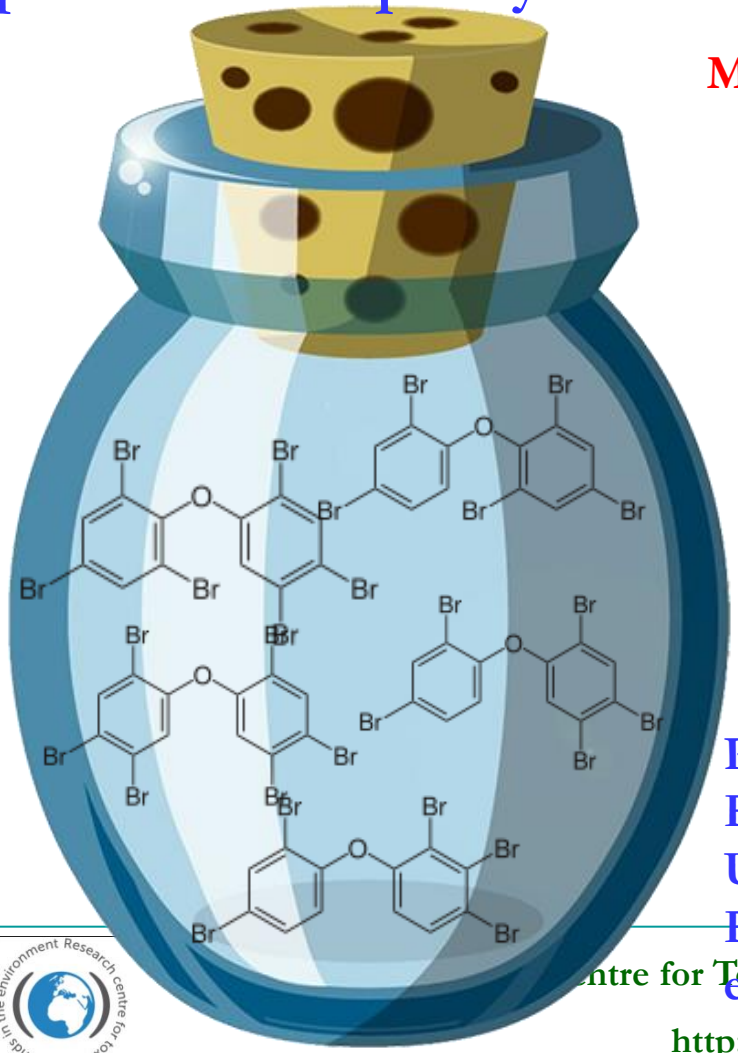


Questions on PFOS contained in articles

- What types of processes use PFOS and related substances?
- What types of articles contain PFOS and related substances?
- What types of articles containing PFOS are recycled?
- What are options for alternative products or processes?
  - Technical feasibility, costs, efficacy, risk, availability, accessibility?
  - Need to develop new technology? How to introduce?

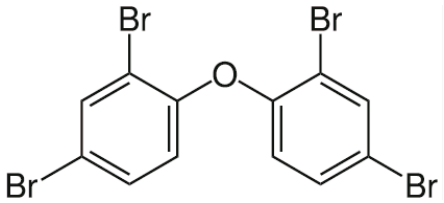
8. Tetrabromodiphenyl ether and pentabromodiphenyl ether

Originally proposed as: "Commercial mixture of pentabromodiphenyl ether"

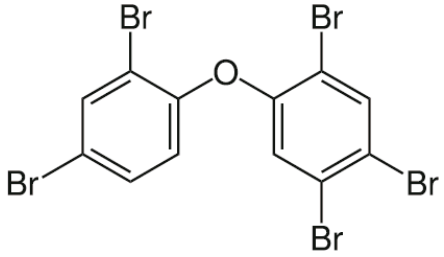


Mixture of brominated organic chemicals, main components are penta- and tetra- isomers

$C_{12}H_5Br_4O$

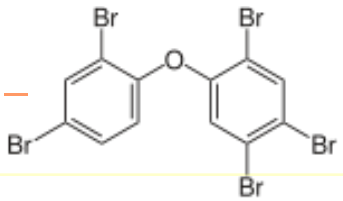
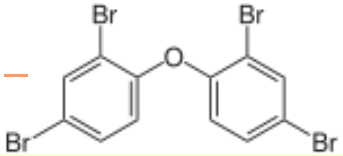
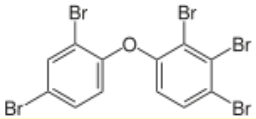
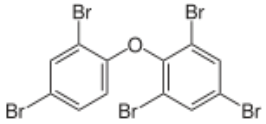
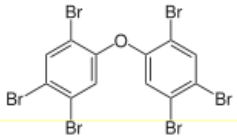
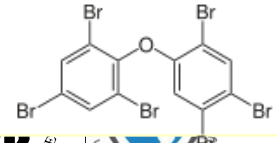


$C_{12}H_5Br_5O$



Proposal: 2005, Norway
Risk profile: UNEP/POPS/POPRC.2/17/Add.1
Risk management evaluation:UNEP/POPS/POPRC.3/20/Add.1

Commercial mixture of pentabromodiphenyl ether

Structure	Congener	Name	Fraction
	BDE-99	2,2',4,4',5-penta-bromodiphenyl ether	45–49 %
	BDE-47	2,2',4,4'-tetra-bromodiphenyl ether	38–42 %
	BDE-85	2,2',3,4,4'-penta-bromodiphenyl ether	2.2–3.0 %
	BDE-100	2,2',4,4',6-penta-bromodiphenyl ether	7.8–13 %
	BDE-153	2,2',4,4',5,5'-hexa-bromodiphenyl ether	5.3–5.4 %
	BDE-154	2,2',4,4',5,6'-hexa-bromodiphenyl ether	2.7–4.5 %

8. Tetrabromodiphenyl ether and pentabromodiphenyl ether

Past use: Most commonly used as a flame retardant in flexible polyurethane foam (PUF); also used in printed circuit boards. The annual demand worldwide was estimated as 7,500t in 2001, (US: 7,100t, Europe 150t, and Asia 150t)

Currently: There should be no current production of commercial pentaBDE in Europe, Japan, Canada, Australia and the US; however, it is possible that production continues elsewhere in the world.

Alternatives: Some known alternatives e.g. triphenyl phosphate, tribromoneopentyl alcohol, tris(1,3-dicholoro-2-propyl)phosphate
- Guidance on feasible flame-retardant alternatives to commercial pentabromodiphenyl ether (POPRC 2008)
- Environmental Profiles of Chemical Flame-Retardant Alternatives for Low-Density Polyurethane Foam (USEPA 2005)

8. Tetrabromodiphenyl ether and pentabromodiphenyl ether

DEFINITION

"Tetrabromodiphenyl ether and pentabromodiphenyl ether" means:

- 2,2',4,4'-tetrabromodiphenyl ether (BDE-47, CAS No: 40088-47-9) and
- 2,2',4,4',5-pentabromodiphenyl ether (BDE-99, CAS No: 32534-81-9) and
- other tetra- and pentabromodiphenyl ethers present in commercial pentabromodiphenyl ether.

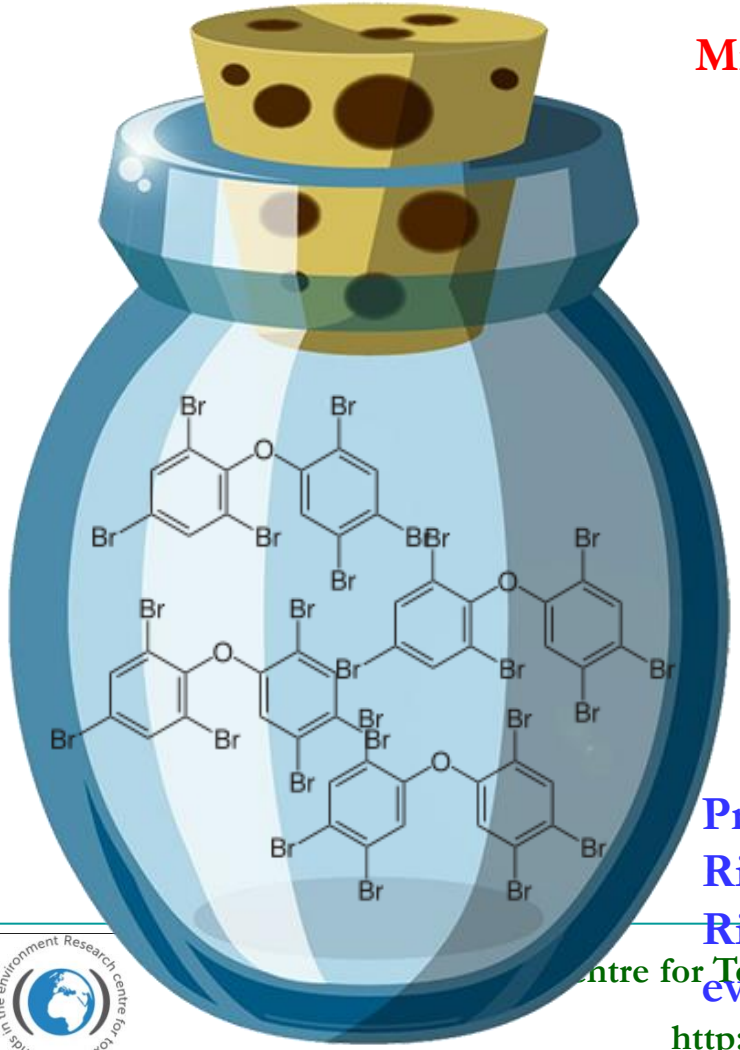
→ Listed in Annex A (Elimination)

→ Exemption for production: none

→ Exemption for use: 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

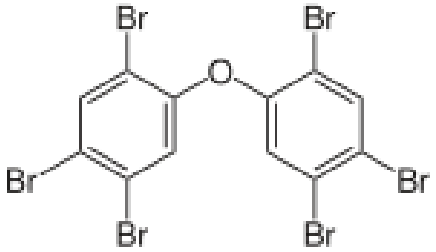
9. Hexabromodiphenyl ether and heptabromodiphenyl ether

Originally proposed as:
"Commercial mixture of octabromodiphenyl ether

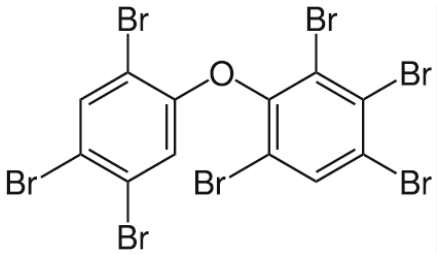


Mixture of brominated organic chemicals, main components are hexa- and hepta- isomers.

$C_{12}H_5Br_6O$

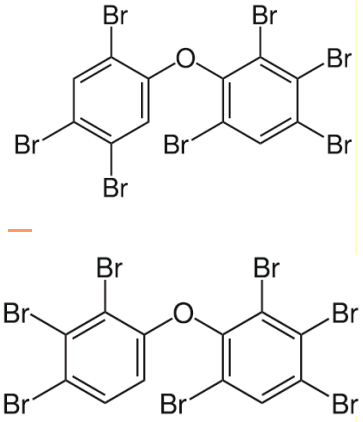
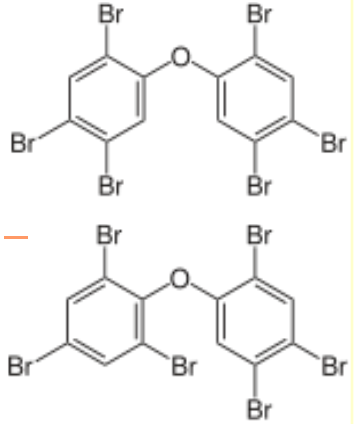


$C_{12}H_5Br_7O$



Proposal: 2006, EU
Risk profile: UNEP/POPS/POPRC.3/20/Add.6
Risk management evaluation:UNEP/POPS/POPRC.4/15/Add.1

Commercial mixture of octabromodiphenyl ether

Structure	Congener	Name	Fraction
	BDE-175/183	2,2',3,4,4',5',6-hepta-bromodiphenyl ether 2,2',3,3',4,5',6 heptabromodiphenyl ether	13–42 %
	BDE-153 BDE-154	2,2',4,4',5,5'-hexa-bromodiphenyl ether 2,2',4,4',5,6'-hexa-bromodiphenyl ether	0.15–8.7 %

9. Hexabromodiphenyl ether and heptabromodiphenyl ether

Past use: Most commonly used as a flame retardant in flexible polyurethane foam (PUF); also used in printed circuit boards. The annual demand worldwide was estimated as 7,500t in 2001, (US: 7,100t, Europe 150t, and Asia 150t)

Currently: There should be no current production of commercial pentaBDE in Europe, Japan, Canada, Australia and the US; however, it is possible that production continues elsewhere in the world.

Alternatives: Some known alternatives e.g. triphenyl phosphate, tribromoneopentyl alcohol, tris(1,3-dicholoro-2-propyl)phosphate
- Guidance on feasible flame-retardant alternatives to commercial pentabromodiphenyl ether (POPRC 2008)
- Environmental Profiles of Chemical Flame-Retardant Alternatives for Low-Density Polyurethane Foam (USEPA 2005)

9. Hexabromodiphenyl ether and heptabromodiphenyl ether

DEFINITION

"Hexabromodiphenyl ether and heptabromodiphenyl ether" means:

- 2,2',4,4',5,5'-hexabromodiphenyl ether (BDE-153, CAS No: 68631-49-2),
- 2,2',4,4',5,6'-hexabromodiphenyl ether (BDE-154, CAS No: 207122-15-4),
- 2,2',3,3',4,5',6 heptabromodiphenyl ether (BDE-175, CAS No: 446255-22-7),
- 2,2',3,4,4',5',6-heptabromodiphenyl ether (BDE-183, CAS No: 207122-16-5) and
- other hexa- and heptabromodiphenyl ethers present in commercial octabromodiphenyl ether.

→ Listed in Annex A (Elimination)

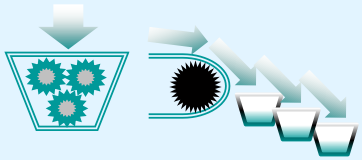
→ Exemption for production: none

→ Exemption for use: 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

Hazards associated with the recycling chain

Recycling chain

Disassembly → Size reduction and separation → Metallurgical treatment → Final treatment



Hazards

Removal of hazardous components	Shredding	Smelting	Incineration and landfilling
Hg switches: Hg Batteries: Cd, Pb, Hg Gas discharge lamps: Hg CRTs: Pb, phosphors	Formation of dust particles containing plastics, metals, ceramic and silica	Emission of metal fumes, mixed chlorinated and brominated dioxins and furans (PXDD/Fs)	Emission of metal fumes, PXDD/Fs Leaching of heavy metals and BFRs

Risks in the recycling and waste treatment process

Chemicals in products/articles
Analysis of chemicals in new products/articles

Samples:

- Liquid crystal display (LCD) TV, Laptop PC, Power supply unit
- Wallpaper, Curtain, Heat insulation material

Target compounds:

- Organobromine compounds (PBPhs, TBBPA, HBCDs, PBDEs)
- Phosphoester plasticizers and flame retardants (TMP, TEP, TPrP, TBP, TClPP, TCEP, TBEP, TDCPP, TOP, TPhP, TCP)

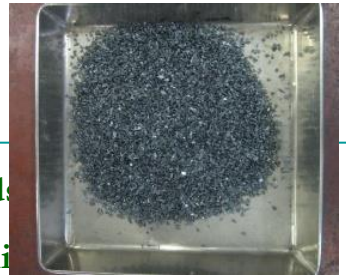
Analytical method:

- Samples were pulverized by frost shattering using liquid N_2.
- HRGC/HRMS and LC/MS methods.

Pulverized samples

Rear cover

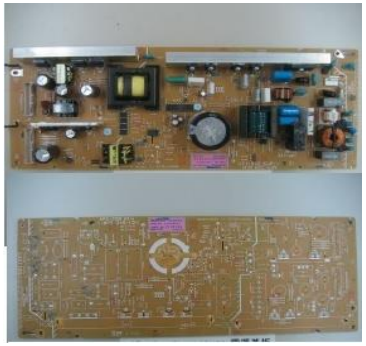
Front cover



LCD panel

Printed circuit board

Printed circuit board (power supply unit)



Printed circuit board (LCD panel)

Situace v ČR

Chemická látka	Příloha	Přijatelný účel/zvl.výjimka
α-hexachlorcyklohexan	A	výroba: žádná použití: žádné
β-hexachlorcyklohexan	A	výroba: žádná použití: žádné
chlordekon	A	výroba: žádná použití: žádné
hexabrombifenyl	A	výroba: žádná použití: žádné
hexa a heptabromdifenylether	A	výroba: žádná použití: výrobky v souladu s ustanoveními části IV přílohy A
γ-hexachlorcyklohexan	A	výroba: žádná použití: žádné
pentachlorbenzen	A a C	výroba: žádná použití: žádné
perfluoroktansulfonová kys., její soli a perfluoroktansulfonylfluorid (PFOS)	B	výroba: pro povolená použití použití: 8 účelů, 12 výjimek
tetra a pentabromdifenylether	A	výroba: žádná použití: výrobky v souladu s ustanoveními části IV přílohy A

Registrované výjimky ČR

- pro tetrabrombifenylether a pentabromdifenylether a pro hexabromdifenylether a heptabromdifenylether zvláštní výjimky s názvem „**výrobky v souladu s ustanoveními části IV přílohy A**“ .
- Pro kyselinu perfluoroktansulfonovou a její soli zvláštní výjimky s názvem „**pokovování (tvrdé pokovování) a pokovování (dekorativní pokovování)**“.
- přijatelné účely s názvem „**fotografické zobrazování, fotorezistentní a protiodrazové povlaky pro polovodiče, hydraulické kapaliny v letectví a pokovování (tvrdé pokovování) pouze v uzavřeném systému**“.
- Zvláštní výjimky registrace na dobu pěti let, tj. do 26. 8. 2015, přijatelné účely bez omezení

Látky projednávané v POPRC

Látka	Pozn.
Chlorované parafíny s krátkým řetězcem	V CLRTAP, nevstoupilo dosud v platnost Projednáván REACH příloha XIV*
endosulfan	Projednáván v CLRTAP
hexabromcyklododekan	Projednáván v CLRTAP Projednáván REACH příloha XIV

- **Na posledním POPRC nebyl předložen žádný nový návrh**
- **Původní záměr EK navrhnout 3 nové látky – pentachlorfenol, hexachlorbutadien a PCNs**
- **(pro POPRC 7 určitě nové návrhy budou)**

** seznam látek, pro jejichž výrobu, dovoz a použití je nutné povolení*

Možné látky k diskuzi

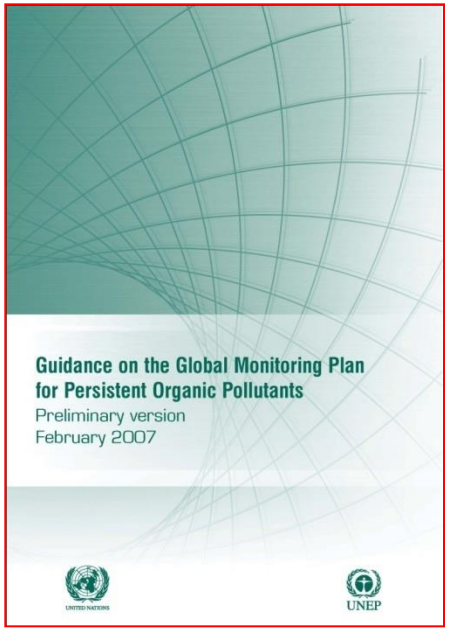
Látka
Pentachlorfenol (projednáván CLRTAP)
Polychlorované naftaleny (v CLRTAP nevstoupilo dosud v platnost)
Hexachlorbutadien (CLRTAP nevstoupilo dosud v platnost)
Trifluralin (projednáván CLRTAP)
Dikofol (projednáván CLRTAP)
PFOA – perfluoroktanová kyselina
Cyklické siloxany
17-alpha-ethinylestradiol
???

Hodnocení účinnosti opatření Stockholmské úmluvy

Hodnocení účinnosti opatření SÚ - Globální monitoring

Článek 16 SÚ - hodnocení účinností opatření úmluvy – každé 4 roky:

- **Data z monitoringu**
- **Regionální a globální transport**



Základní matrice:

- Ovzduší

- Mateřské mléko

Global monitoring plan – regional organisation

Regional monitoring reports

- Introduction, background
- Description of the region
- Regional strategy for information gathering
- Arrangements to address global and regional transport
- Methodology for sampling, analysis and handling of data
- Results
- Summary of findings and discussion

Global monitoring plan – regional organisation

GMP should in each region strive for at least

Three to five stations with active high-volume sampling

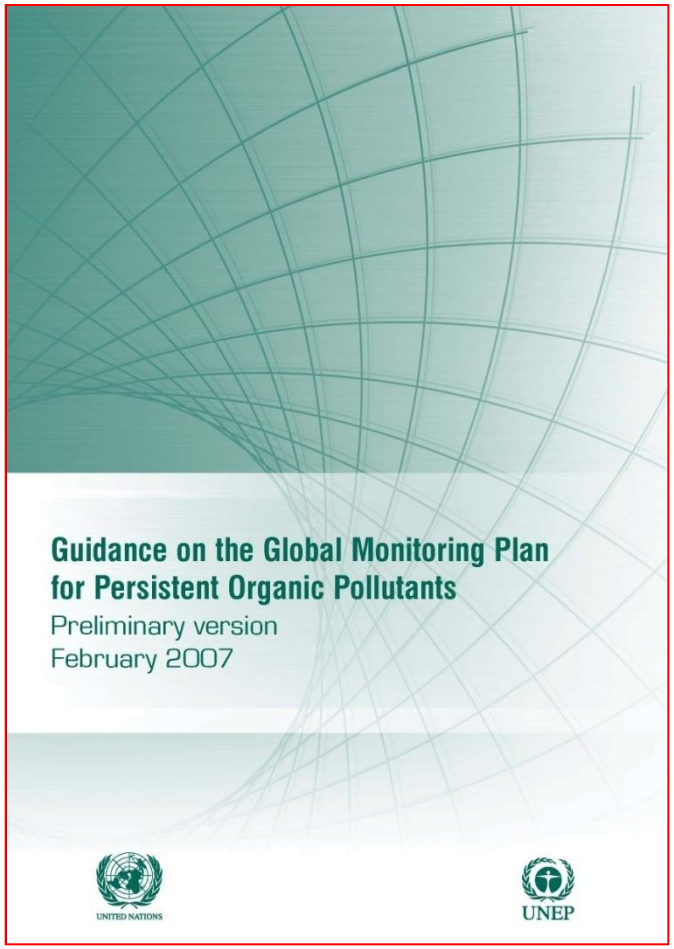
A network of 10 to 15 passive sampling stations arranged in a grid with spacingof approximately 200 x 200 km for enhancing geographical coverage .

Passive samplers should be co-located at the high volume sites for comparison purposes.

Cumulative sampling (for 1 to 2 days every week or continuously over periodsof 1 to 2 weeks) by active high volume sampling (~0.5-1 m3/min. flowrate) at a few sites in each region. These samples would be separated into particulate and gaseous fractions.

Continuous, cumulative passive (diffusive) sampling for integration periods of 3 months to 1 year using passive samplers deployed at a large number of sites, including the high volume sampling sites.

Globální POPs monitoring - ovzduší



UNEP - Stockholm Convention on POPs
"Effectiveness Evaluation"

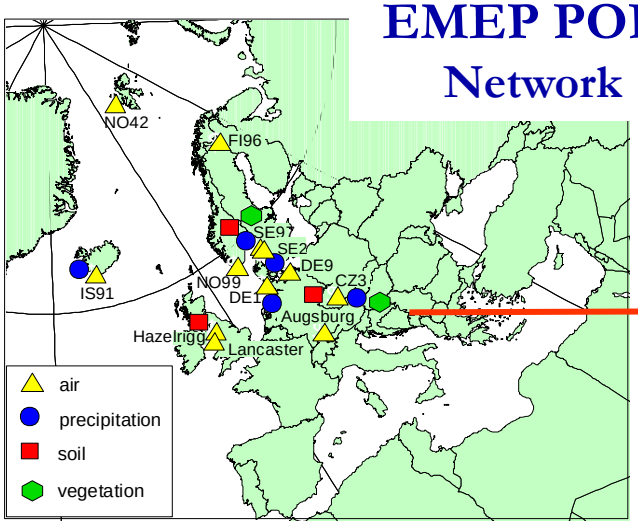
Ovzduší:

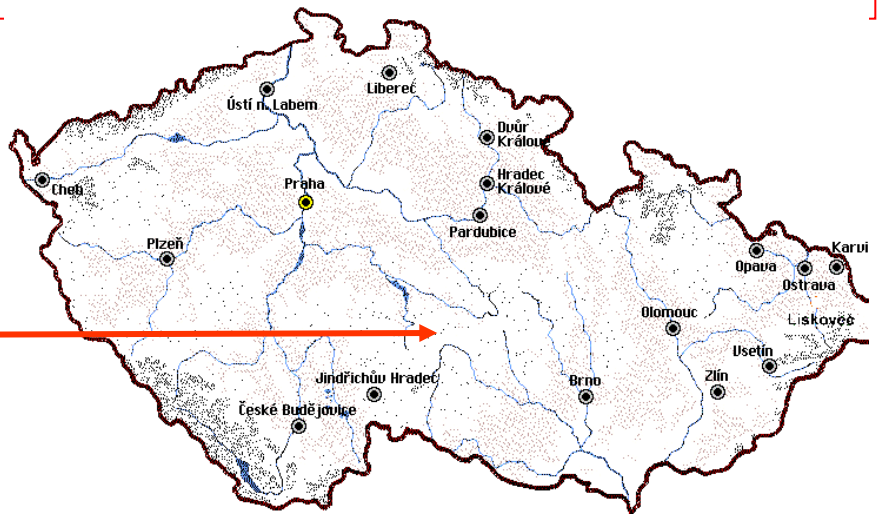
Pasivní vzorkování jako doplněk aktivního velkoobjemového vzorkování:

- Není potřeba čerpadlo a proud
- Malé a laciné
- Jednoduché

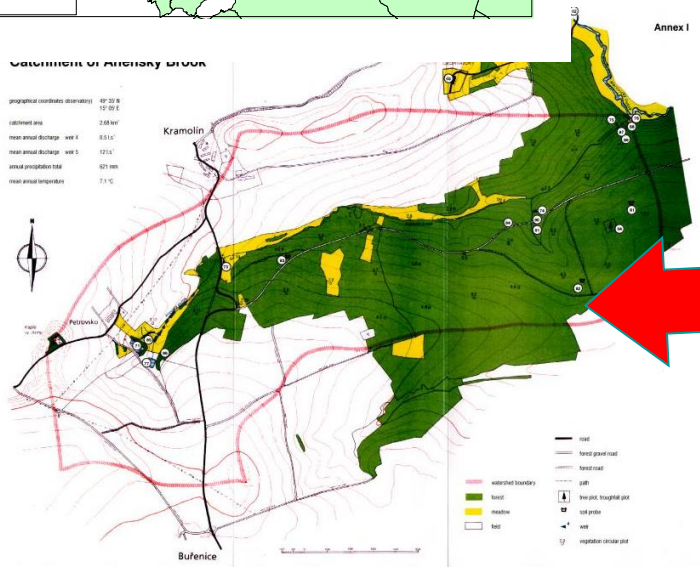
Regionalní monitoring POPs

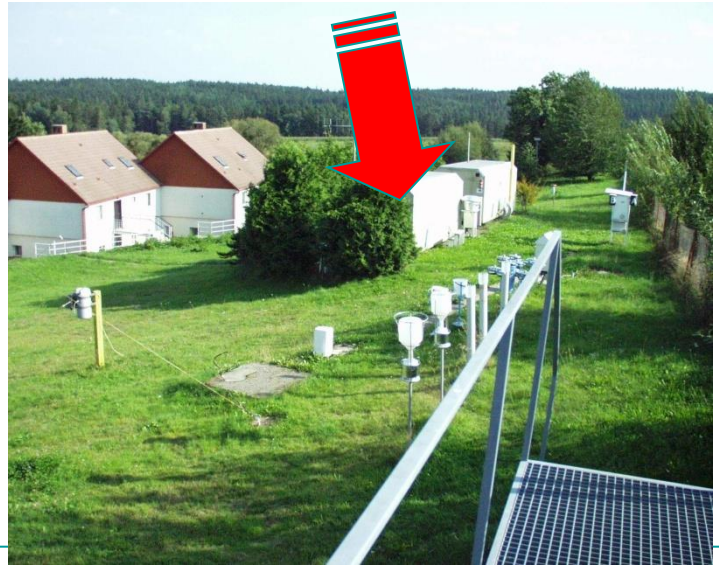
EMEP POPs Network



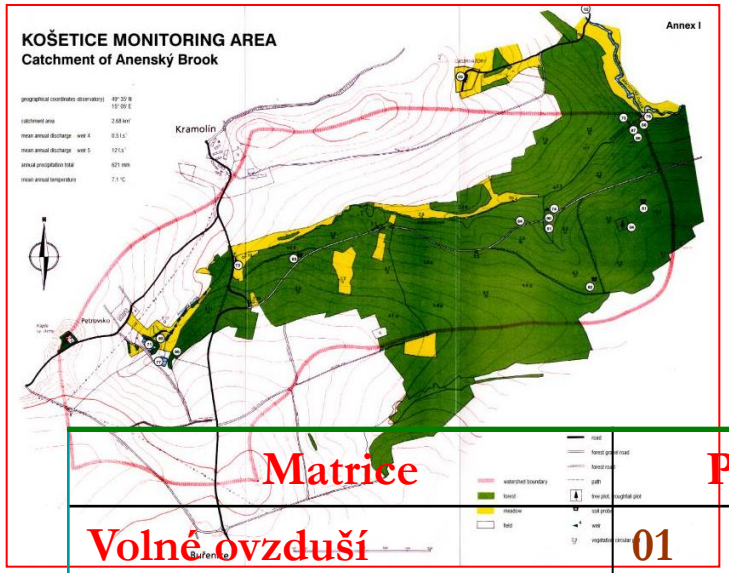


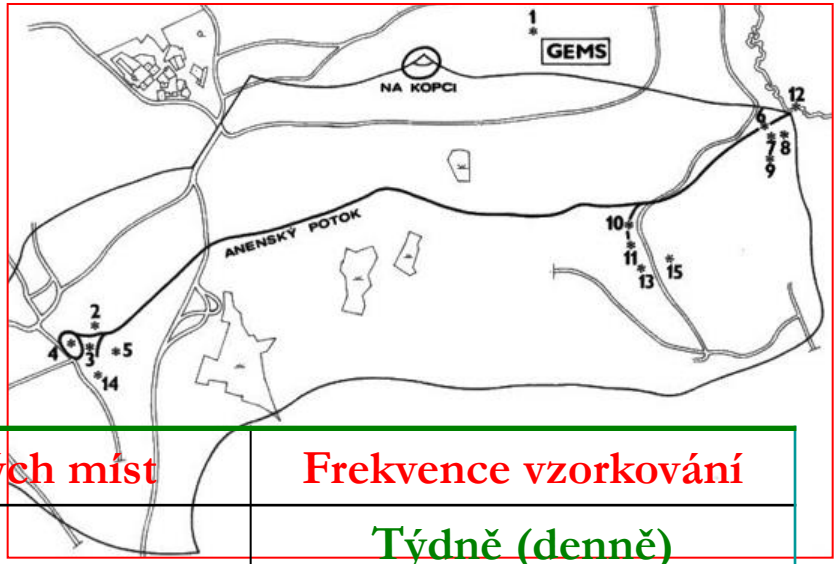
Observatoř Košetice





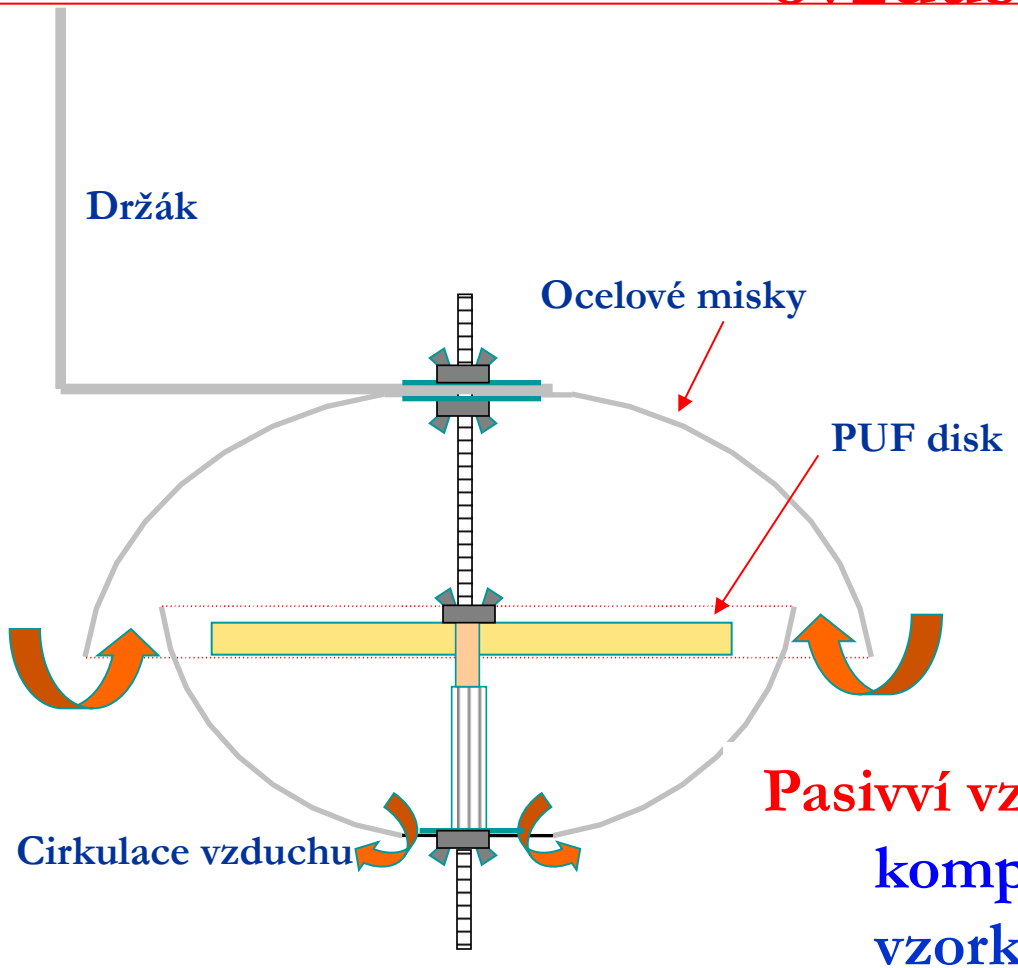
Integrovaný monitoring POPs – odběrová místa a vzorkovací frekvence – observatoř Košetice – od 1988





Matrice	Počet odběrových míst	Frekvence vzorkování
Volné ovzduší	01	Týdně (denně)
Mokrá depozice	01	Každá srážka
Povrchové vody	02, 04, 10, 12a, 12b, 14	Ročně
Sedimenty	02, 04, 10, 12a, 12b, 14	Ročně
Půdy	01, 03, 05, 07, 08, 09, 11, 13, 15	Ročně
Opad	09	Ročně
Borové a smrkové jehličí	05, 07, 08, 09, 13, 15, 16	Ročně
Mechy	05, 07, 08, 09, 13, 15, 16	Ročně

Pasivní vzorkovače pro stanovení POPs ve volném ovzduší



Pasivní vzorkovače – komplementární aktivnímu vzorkování.

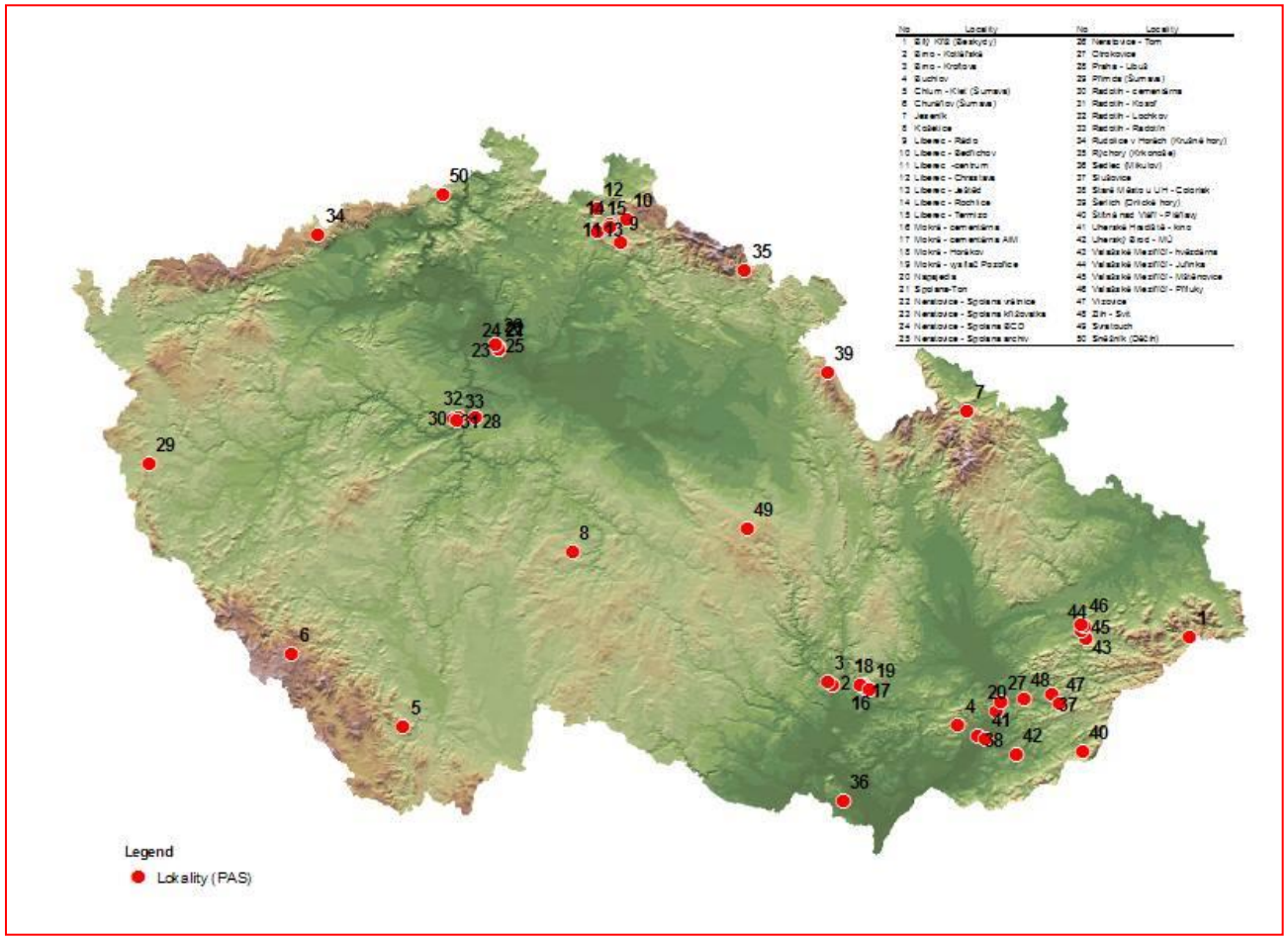
- Bez pumpy a proudu
- Malý a laciný
- Jednoduchý

Pasivní vzorkovače pro stanovení POPs ve volném ovzduší

Koncepční přístup centra RECETOX:

- Využitelnost pro monitoring na globální, regionální, lokální úrovni
- Vývoj a založení monitorovací sítě v České republice (MONET-CZ) a CEECs (MONET-CEECs)
- Vliv environmentálních faktorů
- Studium místních vlivů
- Studium časových a prostorových trendů
- Aplikace pro toxikologické testování

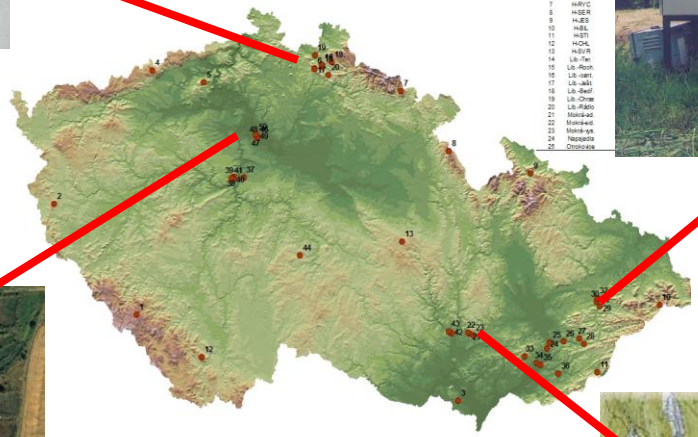
Česká národní monitorovací síť POPs ve volném ovzduší metodou pasivního vzorkování (MONET-CZ)



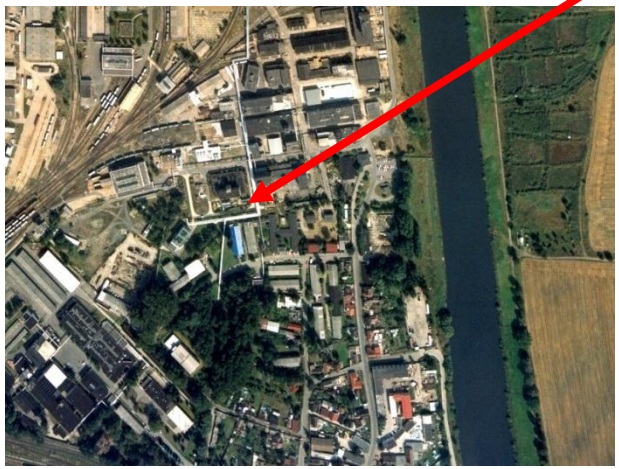
Studium modelových zdrojů POPs a studium lokálních vlivů

Spalovny odpadů

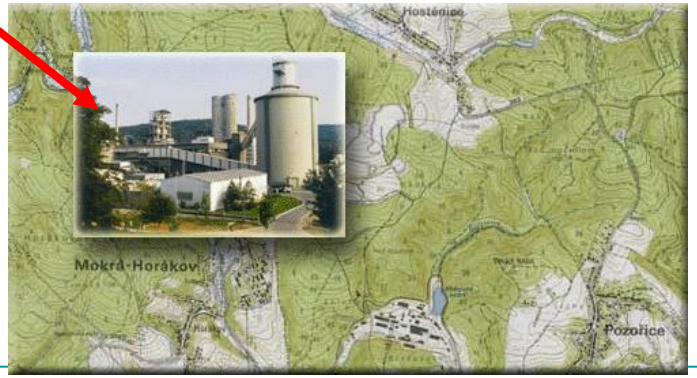
DEZA Valašské Meziříčí



Spolana Neratovice



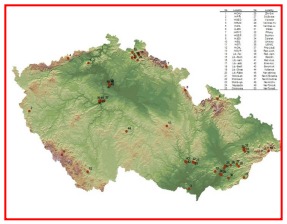
Cementárny



Global/national POPs monitoring - MONET

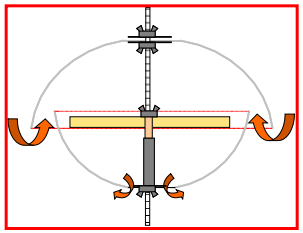
RECETOX Monitoring Network

MONET = MOnitoring NETwork



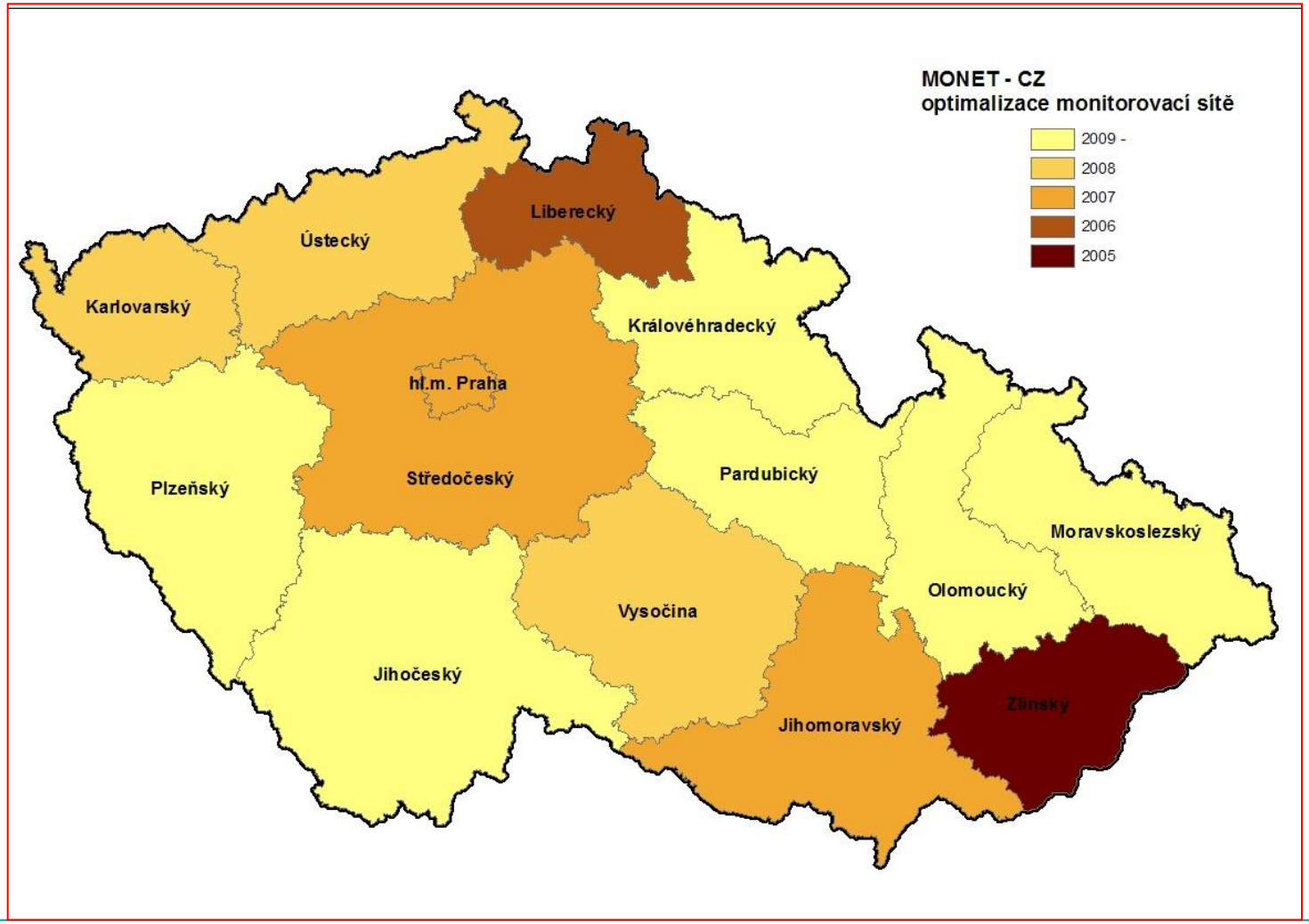
MONET-CZ = Czech Republic	MONET-PIs = Pacific islands - Fiji
MONET-CEECs = 20 CEE countries + 2 CA countries	MONET-Africa = 17 African countries

MONET-EUROPE – 55 sampling sites round whole Europe

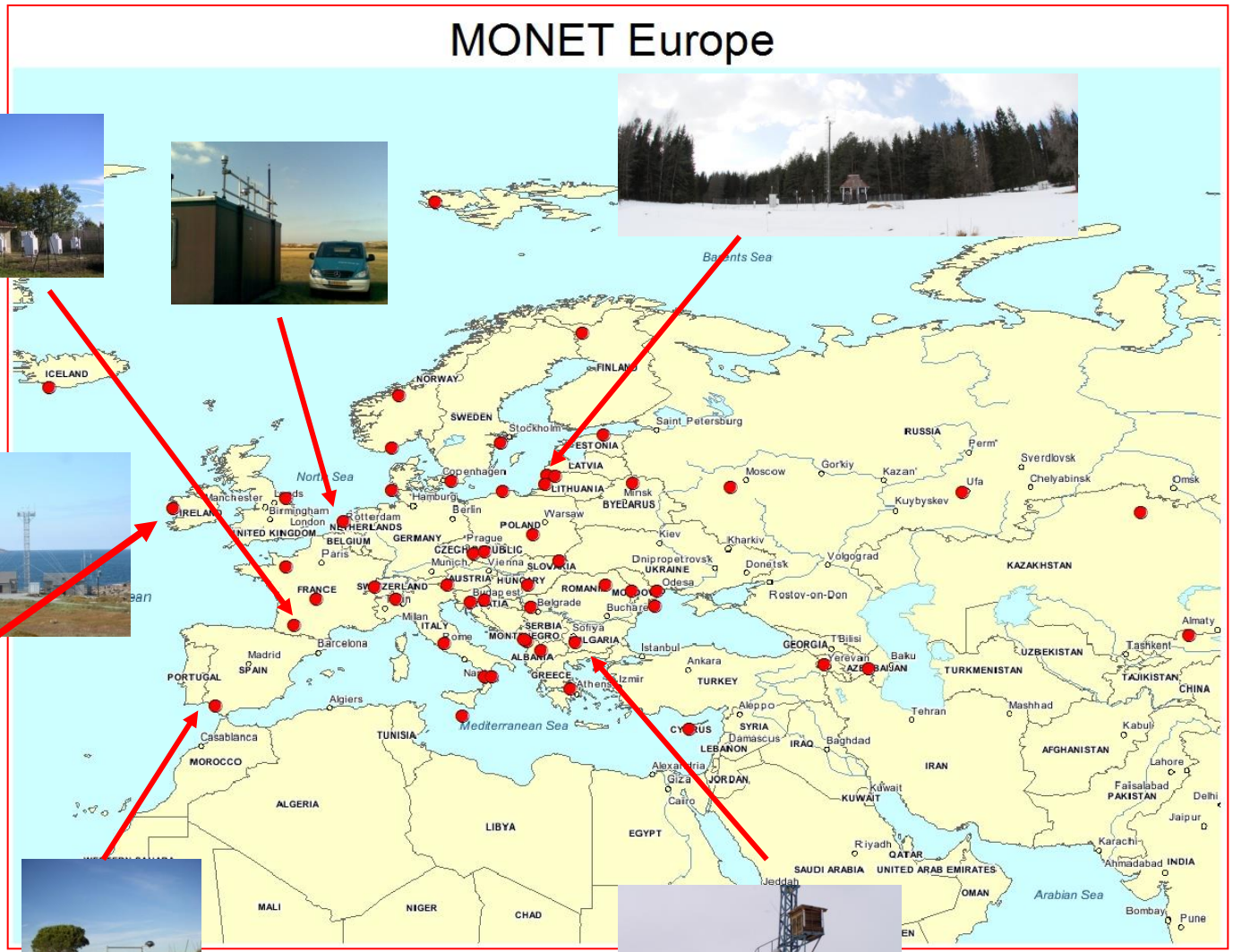


monet

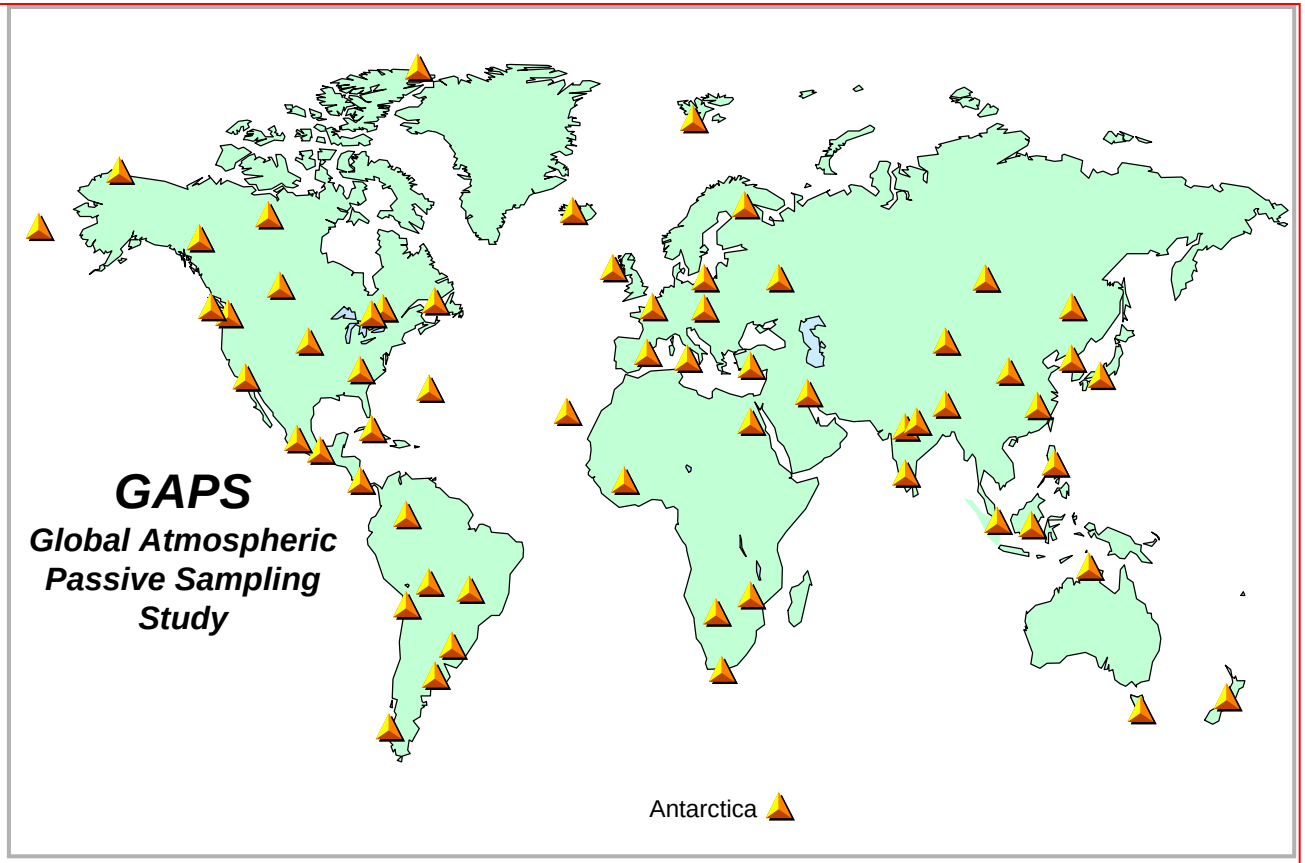
RECETOX/Národní POPs Centrum ČR – MONET-CZ/REGION – Krajské studie

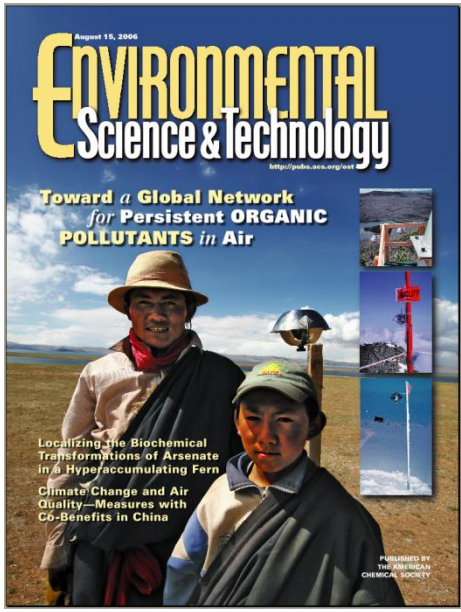


MONET-EUROPE – 2009-2011 – 55 odběrových míst



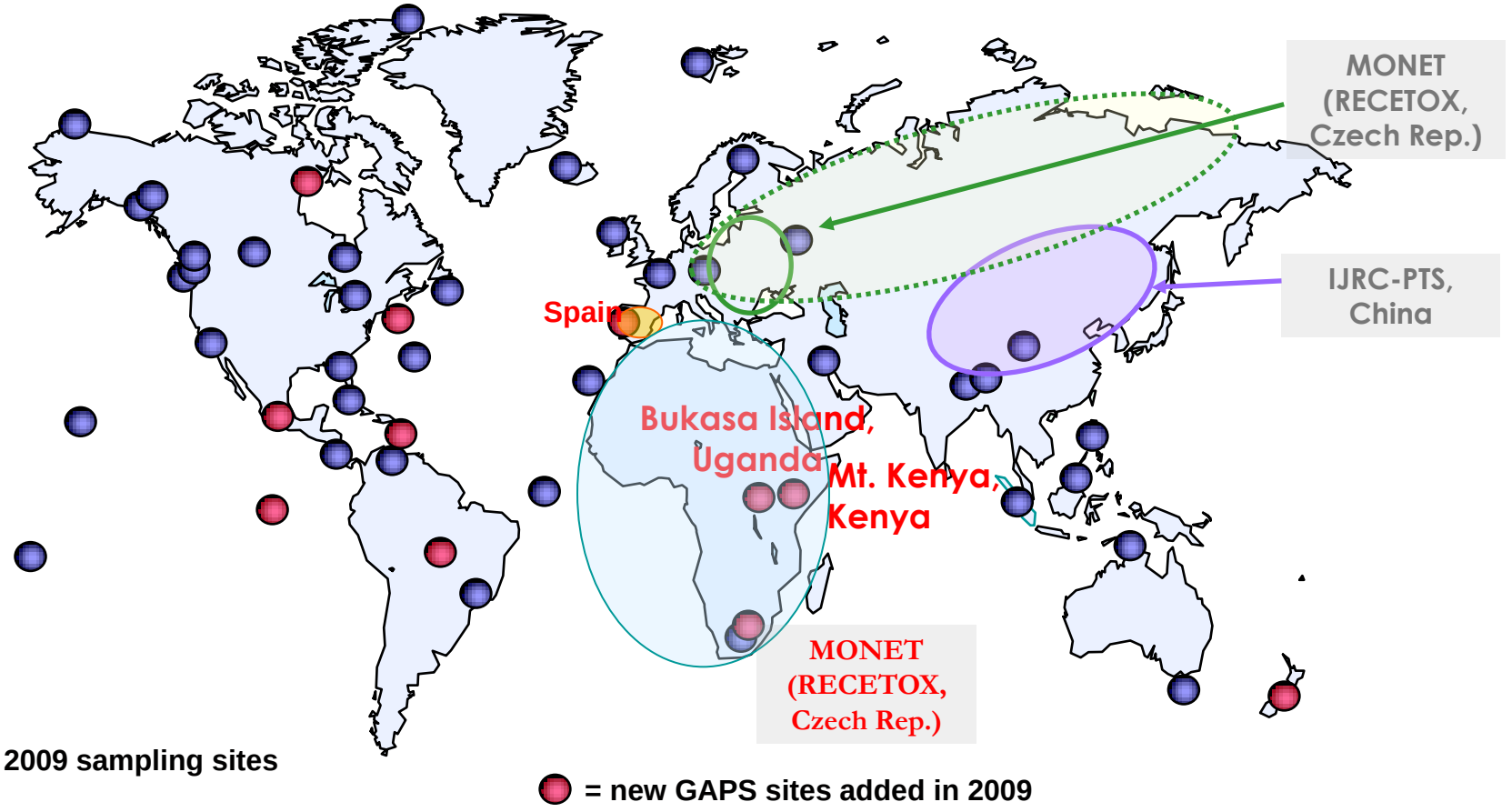
Environment Canada - GAPS = Global Atmospheric PAssive Sampling Study



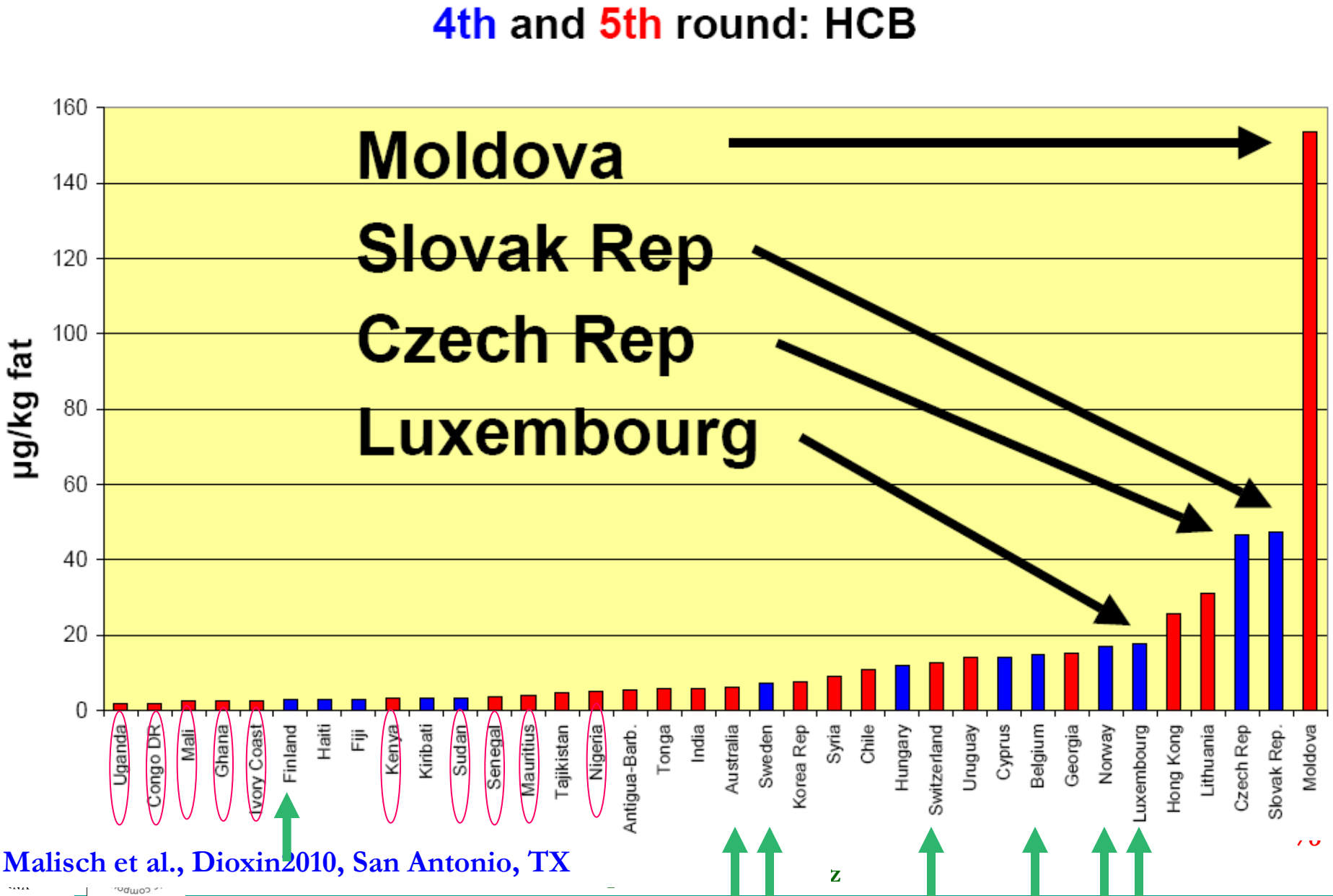


T. Harner

Global Passive Air Sampling Programs

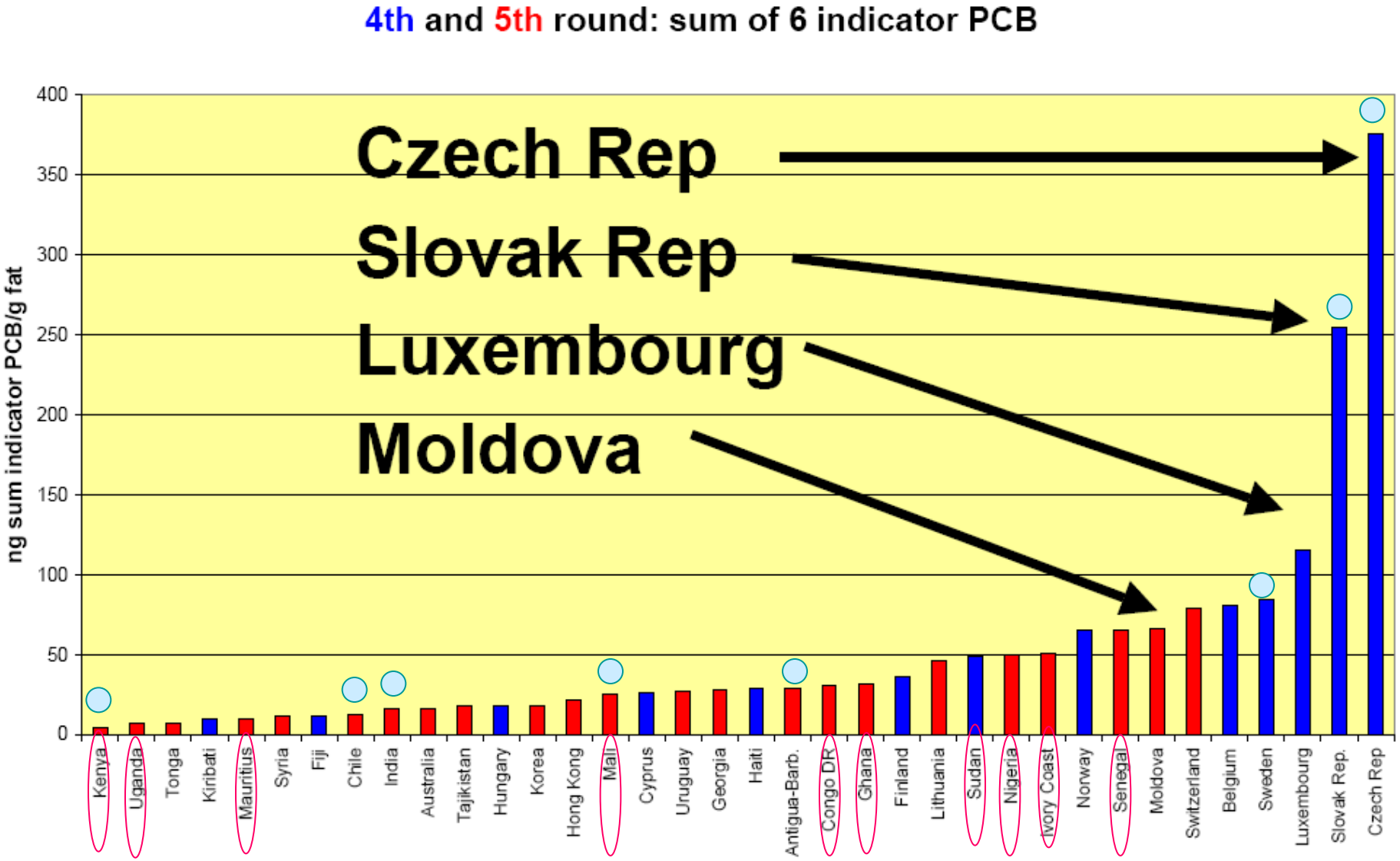


POPs v mateřském mléce, studie WHO, 2008-9 – HCB [µg.kg^{-1} tuku]



Malisch et al., Dioxin2010, San Antonio, TX

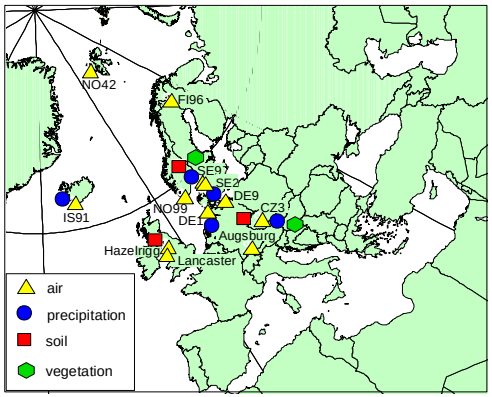
POPs v mateřském mléce, studie WHO, 2008-9 – Σ 6 PCBs [μg.kg^{-1} tuku]



Malisch et al., Dioxin2010, San Antonio, TX

Superstation concept - Observatory Košetice, CR

EMEP POPs Network

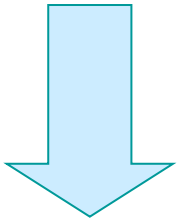


Integrated POPs monitoring - Observatory Košetice

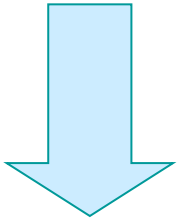
Comparison of existing programmes (EMEP, GAPS, MONET) and approaches (active vs. passive)

Budoucí vývoj

Měření – monitoring – modelování



Základní informace týkající se hladin a distribuce

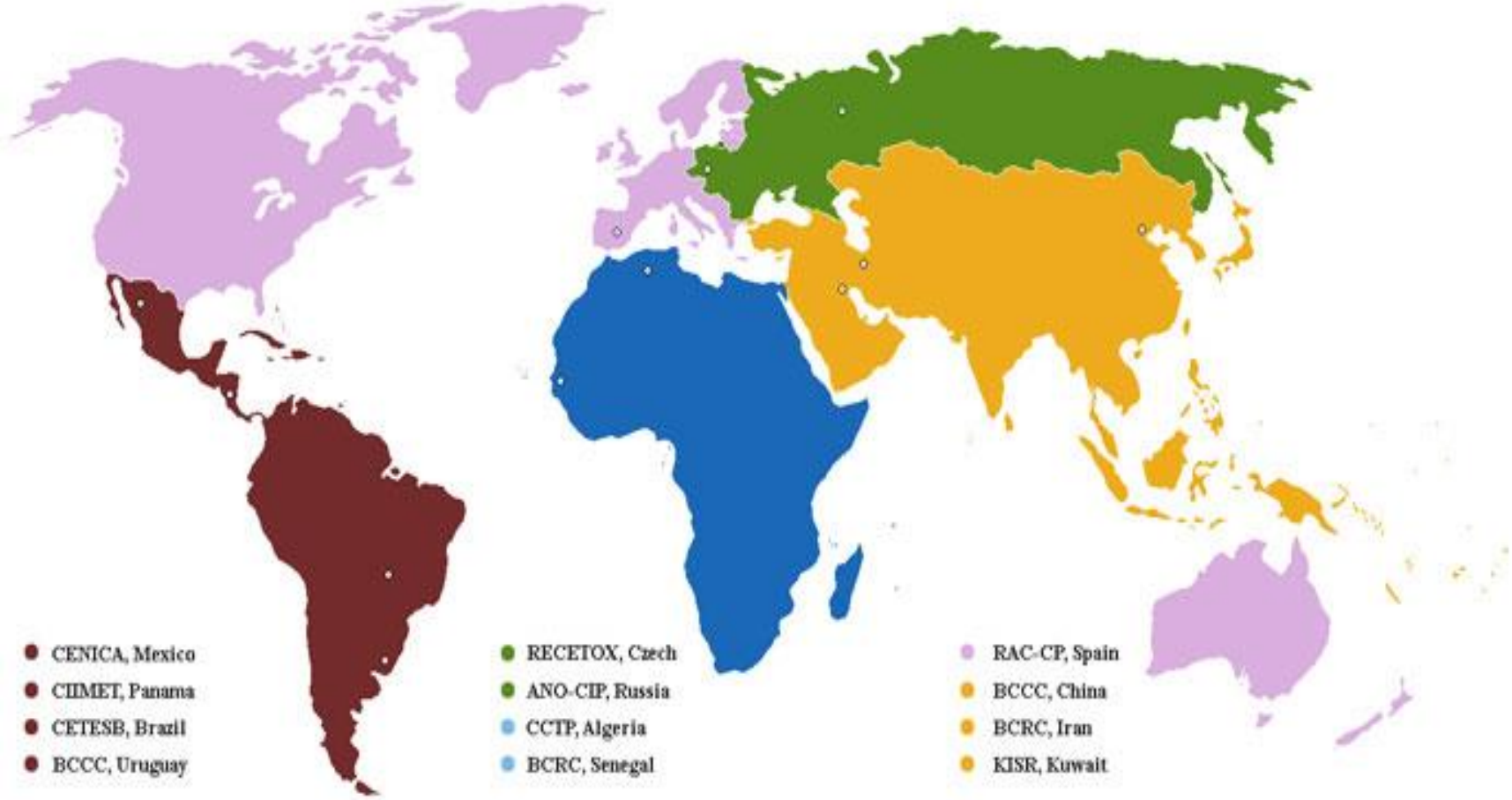


Nástroje pro hodnocení účinků, dopadů a rizik


home
contacts
Global Environmental
Assessment Information System
POPs
Stockholm Convention
Data sources
Analytical tools
Research topics
Partners
GENASIS 1.0 - http://www.genasis.cz

Regionální centra SÚ

REGIONAL AND SUBREGIONAL CENTRES FOR TECHNICAL ASSISTANCE AND CAPACITY BUILDING



Stockholm Convention Centres for capacity-building and transfer of technology

RECETOX POPs Research topics and areas of experties

Environmental occurrence of PTS

- Monitoring
- Human and ecological risk assessment
- Environmental technologies, disposal and (bio)remediation

Education, awareness raising

- University education on MSc and PhD levels in the field of environmental chemistry, ecotoxicology and mathematical biology
- Training courses, summer schools
- Organisation of workshops, seminars, conferences

Summer Schools

Identified areas of technical assistance and technology transfer needs and priorities

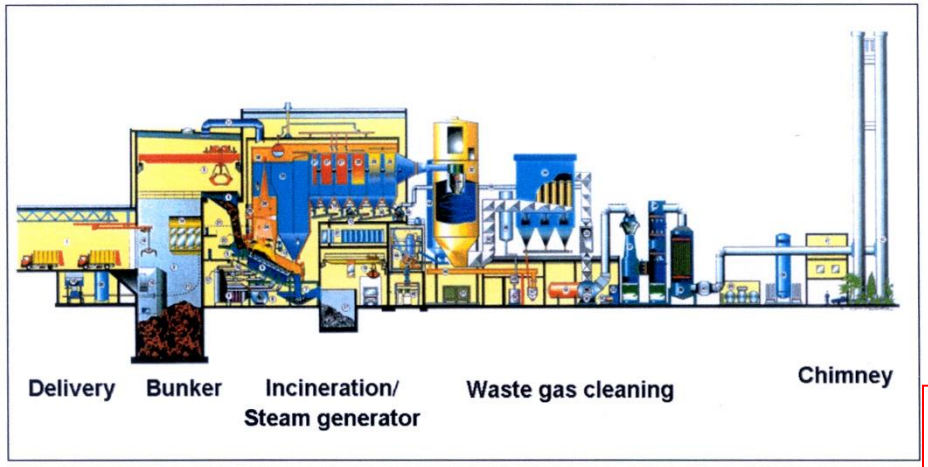
(c) Training for decision-makers, managers and personnel responsible for issues related to the Convention in:

i. Persistent organic pollutants identification;
ii. Technical assistance needs identification;
iii. Project proposal writing;
iv. Legislation development and enforcement;
v. Development of an inventory of persistent organic pollutants;
vi. Risk assessment and management of polychlorinated biphenyls (PCBs), dioxins and furans;
vii. Evaluation of social and economic impacts;
viii. Development of pollutant release and transfer registers;

Další nástroje (BAT/BEP, Dioxin Toolkit, PCBs elimination network, DDT alternatives)

Guidance for BAT/BEP

Guidelines on best available techniques and provisional guidance on best environmental practices relevant to Article 5 and Annex C of the Stockholm Convention on Persistent Organic Pollutants



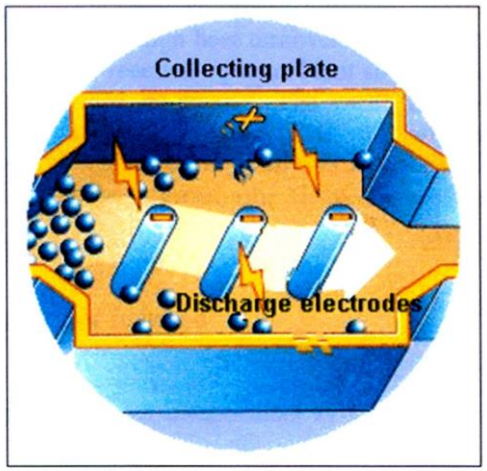


Figure 4.1 Electrostatic Precipitator Principle [source: EU BREF, 2004]

Nástroje SÚ – Guidance for BAT/BEP

Následující kategorie průmyslových zdrojů mají schopnost poměrně značné tvorby a úniku uvedených chemikálií do životního prostředí:

1. spalovny odpadů včetně spoluspalování komunálních, nebezpečných nebo zdravotnických odpadů nebo čistírenských kalů
2. cementářské pece spalující nebezpečný odpad
3. výroba celulózy a papíru používající chlór nebo chemikálie uvolňující chlor pro bělení
4. následující tepelné procesy v metalurgii:

- druhotná výroba mědi
- aglomerační zařízení v železářském a ocelářském průmyslu
- druhotná výroba hliníku
- druhotná výroba zinku.

Nástroje SÚ – Guidance for BAT/BEP

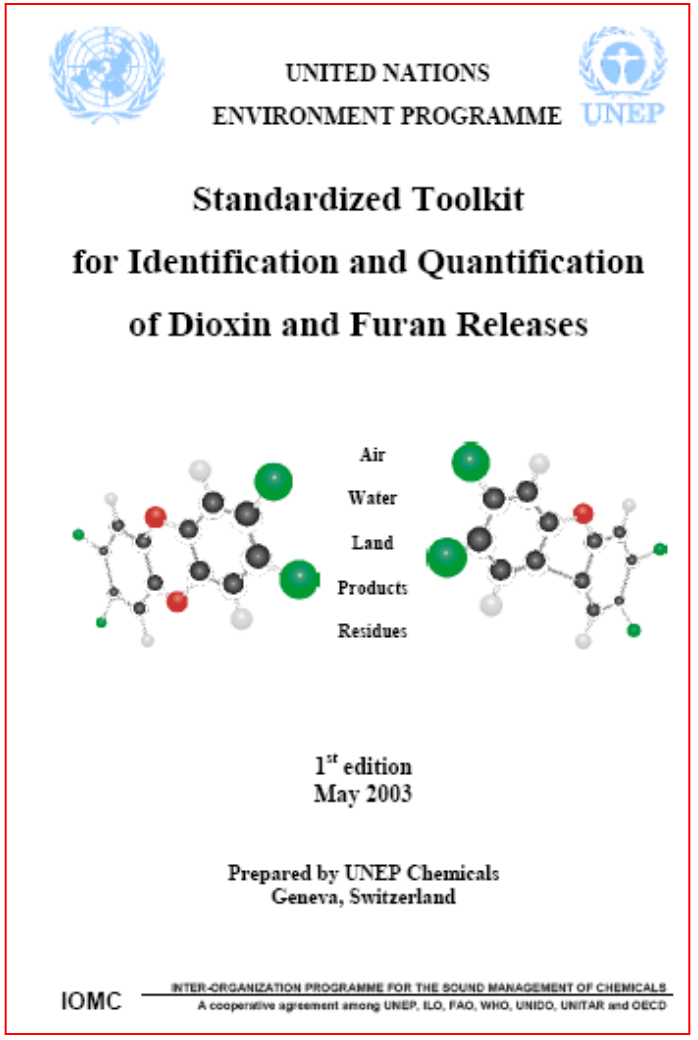
Polychlorované dibenzo-p-dioxiny a dibenzofurany, hexachlorbenzen a polychlorované bifenyly se mohou také samovolně tvořit a uvolňovat u následujících kategorií zdrojů včetně:

- otevřeného spalování odpadu včetně hoření skládek
- tepelných procesů v metalurgickém průmyslu nezmíněných v části II
- domovních zdrojů spalování
- zařízení a průmyslových kotlů na spalování fosilních paliv
- zařízení na spalování dřeva a další biomasy
- speciálních procesů chemické výroby, při kterých se samovolně vyvíjejí persistentní organické polutanty, zvláště při výrobě chlorfenolu a chloranilu
- krematorií
- provozu motorových vozidel, zejména při spalování olovnatého benzínu
- destrukce zvířecích zdechlin (likvidace kadáverů)
- barvení (chloranilem) a konečná úprava (s alkalickou extrakcí) textilu a kůže
- šrotovacích strojů pro zpracování vyřazených vozidel
- doutnání měděných kabelů
- rafinérií odpadových olejů.

Dioxin Toolkit

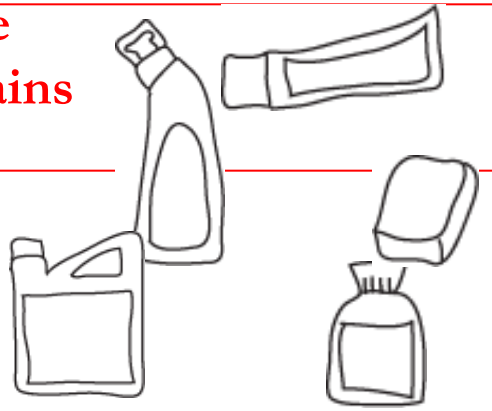
The United Nations Environment Programme UNEP Standardized Toolkit for Identification and Quantification of Dioxin and Furan Releases is designed to cover all source categories and processes that are listed in Annex C, Parts II and III of the Stockholm Convention.

The Toolkit can be used where there are no measured data available and provides default emission factors for all source categories.

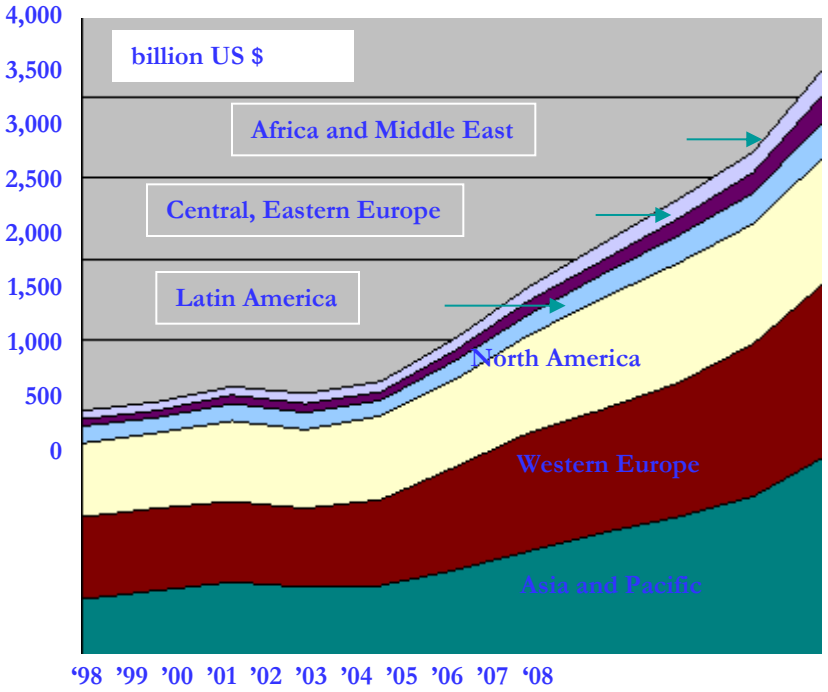


GLOBAL ACTION TOWARDS THE RISK REDUCTION OF POPs

The chemicals industry is one of the largest sectors of the world economy. Nearly every manufactured product contains one or more of the thousands of chemicals produced.



Global chemical production by region
(Source: American Chemistry Council, 2009)



Many are important and essential to modern society and can be used safely,

… but some can pose a serious threat to human health and the environment.

Global action to address the risk reduction by Environmentally Sound Management of chemicals:

6 programme areas outlined in Agenda 21

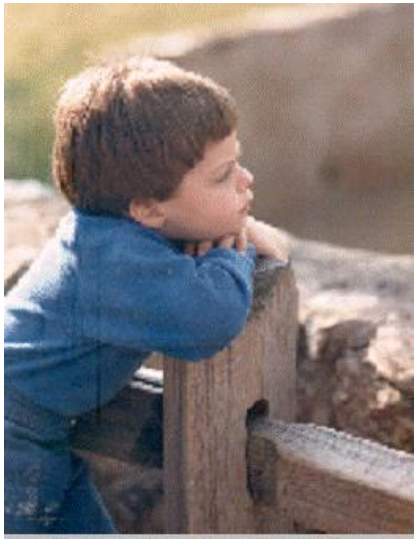
- Expanding and accelerating international assessment of chemical risks
- Harmonization of classification and labelling of chemicals
- Information exchange on toxic chemicals and chemical risks
- Establishment of risk reduction programmes
- Strengthening of national capabilities, capacities for management of chemicals
- Prevention of illegal international traffic in toxic and dangerous products

International initiatives today:

- Several multilateral agreements, Intergovernmental Organizations and coordinating mechanisms

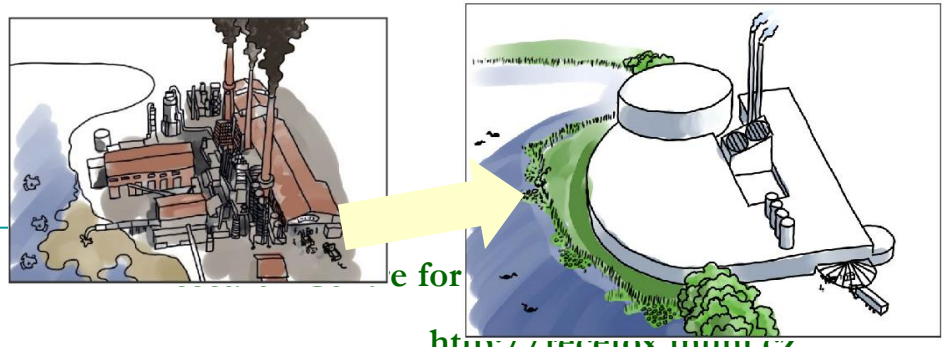
Global action towards the risk reduction of POPs

- How has it been evolved?
  - Brief history of the POPs negotiation
- What does it do?
  - Overview of the Convention
- What has been done and where to?
  - Highlights on achievements and challenges



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

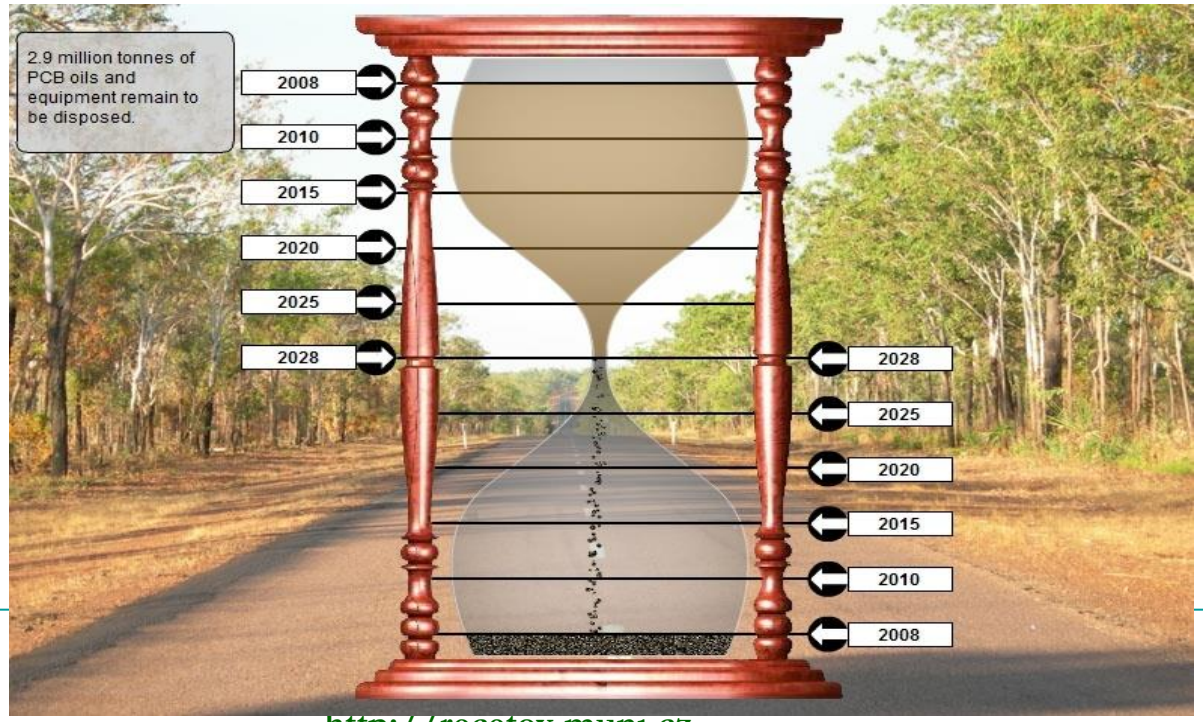


Convention at a glance DDT: Global Alliance

- Establish a clear platform and a joint leadership to address the challenges around the development and deployment of alternatives to DDT;
- Enhance clarity on the understanding and agreement on goals and issues while creating momentum in addressing the challenges;
- Improve coordination between individual initiatives aimed at developing and deploying alternatives to DDT and addressing the interactions between goals;
- Address gaps identified in existing initiatives in a proactive manner while limiting the potential for duplication.

Convention at a glance
PCBs: Elimination Network (PEN)

- Equal partnership
- Promote collaboration and information exchange
- Promote environmentally sound management and its equipment
- Promote technical assistance and technology-transfer



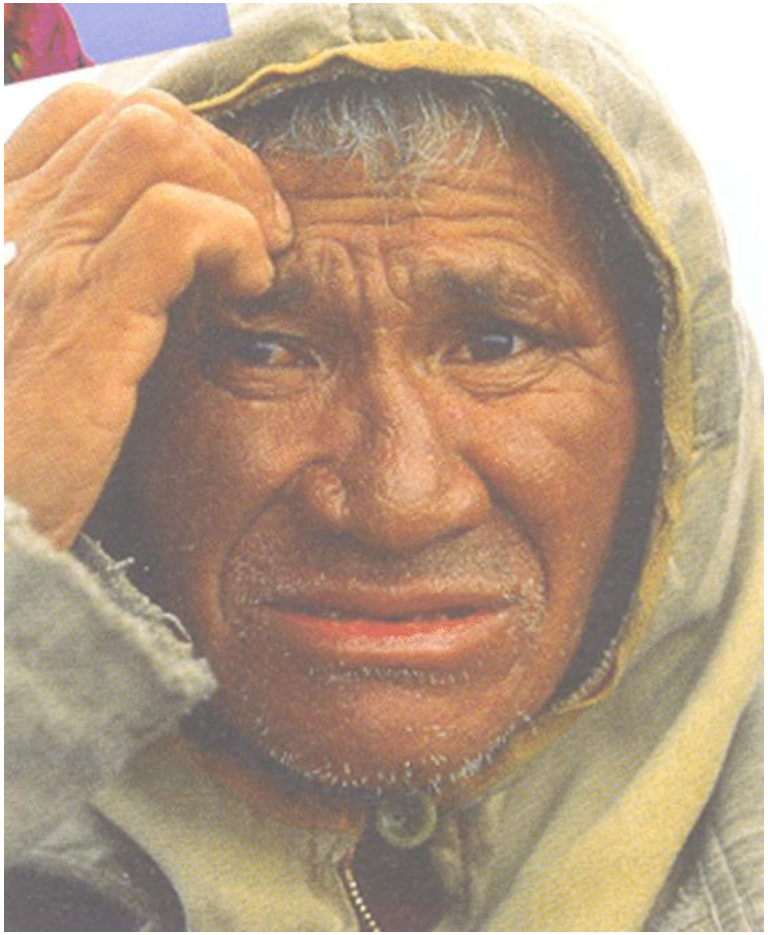
Occurrence of POPs in the Arctic

Results from the AMAP 2004 Assessment report

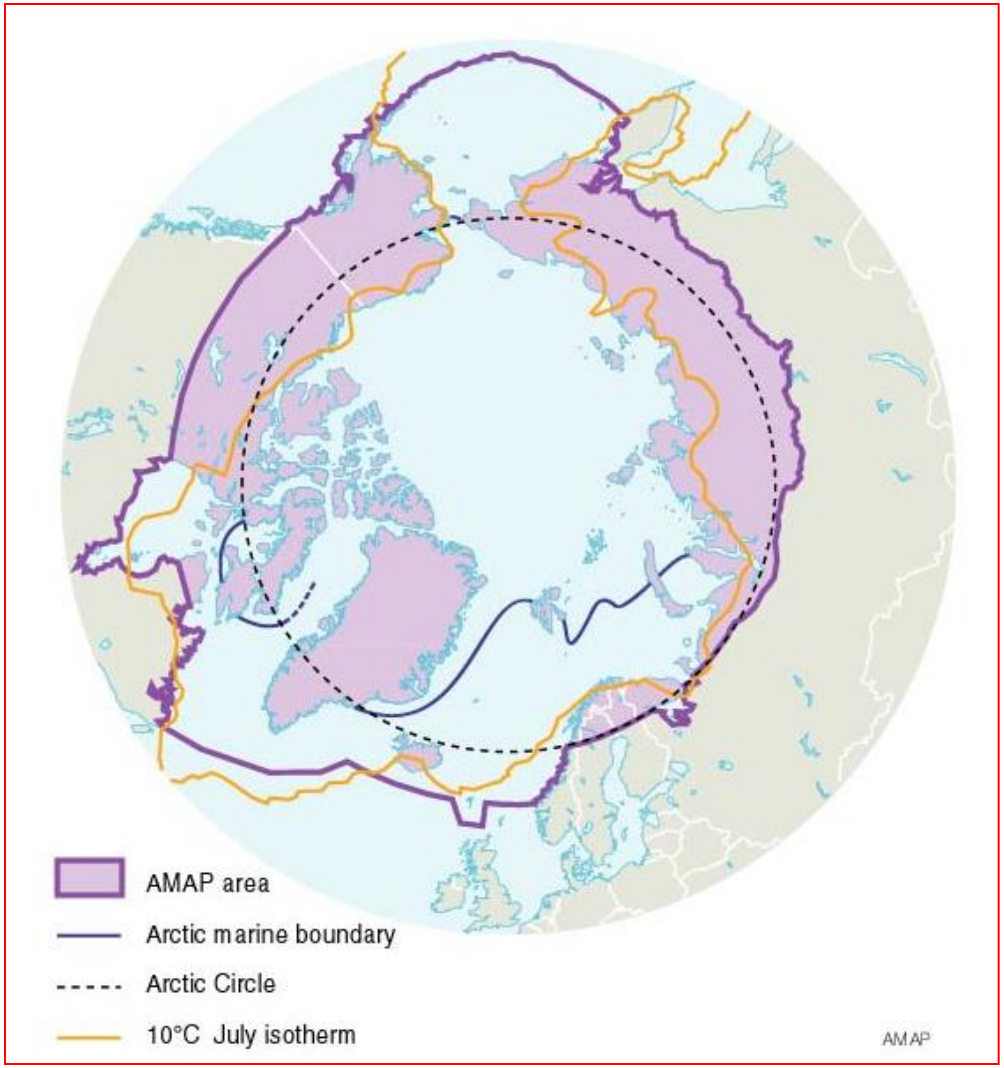
Lars-Otto Reiersen

Arctic Monitoring and Assessment Programme

www.amap.no

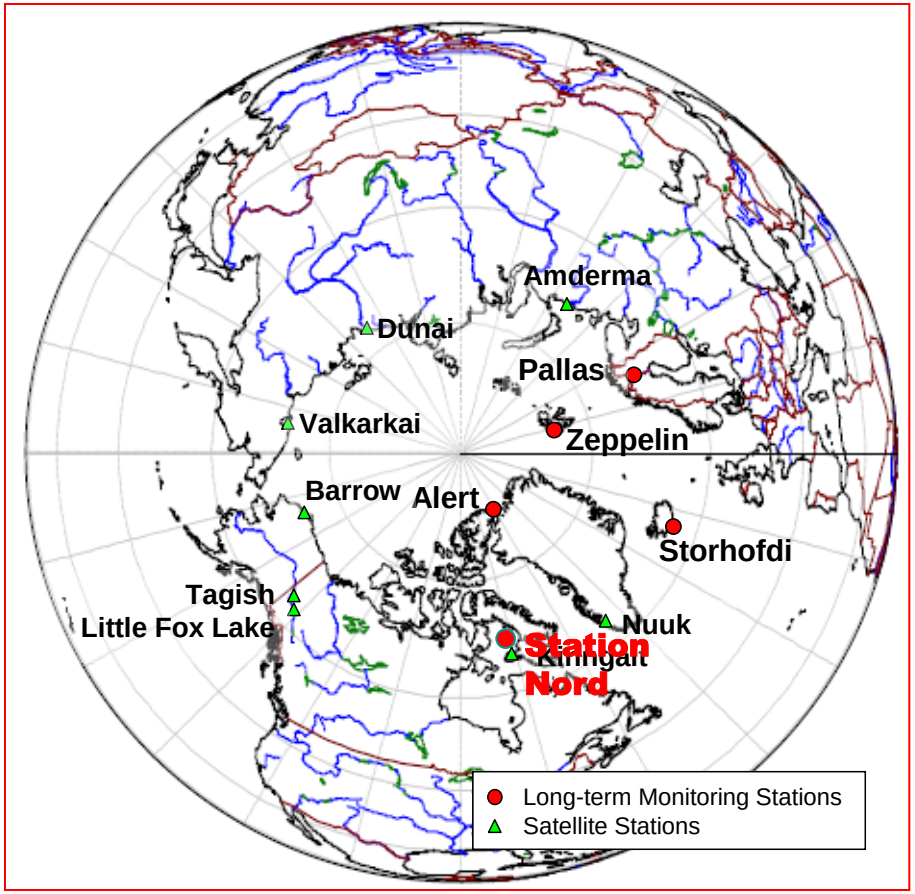


AMAP's geographical coverage



Arctic Monitoring and Assessment Programme (AMAP)

- 5 long-term monitoring stations:
  - Alert, Canada
  - Zeppelin, Svalbard/Norway
  - Storhofdi, Iceland
  - Pallas, Finland
  - Station Nord, Greenland (NEW, started 2007)
- Satellite stations:
  - 3 Canadian, 1 Alaskan, 3 Russian
- Contribute to AMAP POPs Assessment Reports in 1997, 2002 and 2010
- Starting to screen for emerging chemicals:
  - Alert: PBDEs (2002-ongoing); Other FRs, PFCs and CUPs (2006-ongoing)
  - Zeppelin: PBDEs and PFCs (2006-ongoing)
  - Station Nord: PFCs, OCs (2007-ongoing)



Pathways for POPs to the Arctic

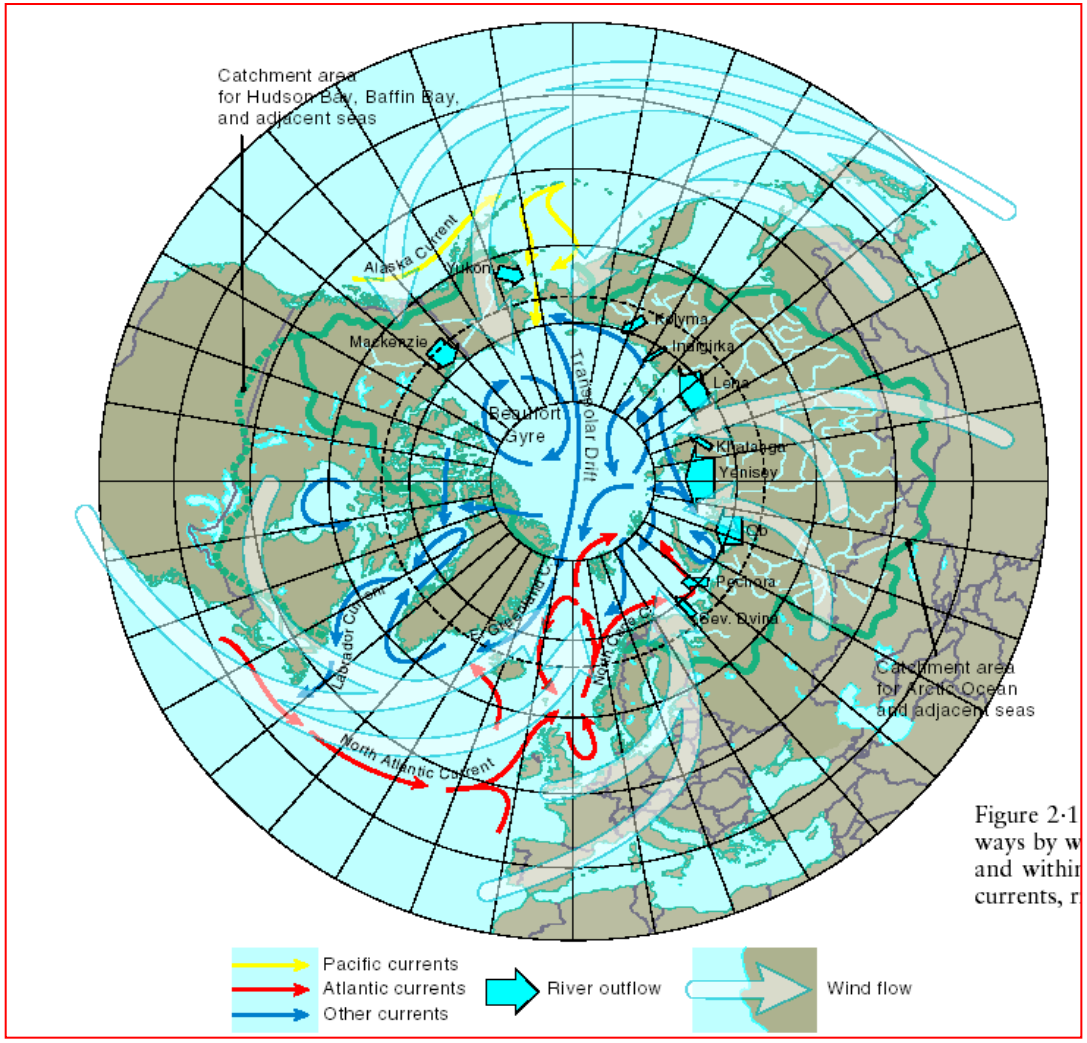


Figure 2·1
ways by w
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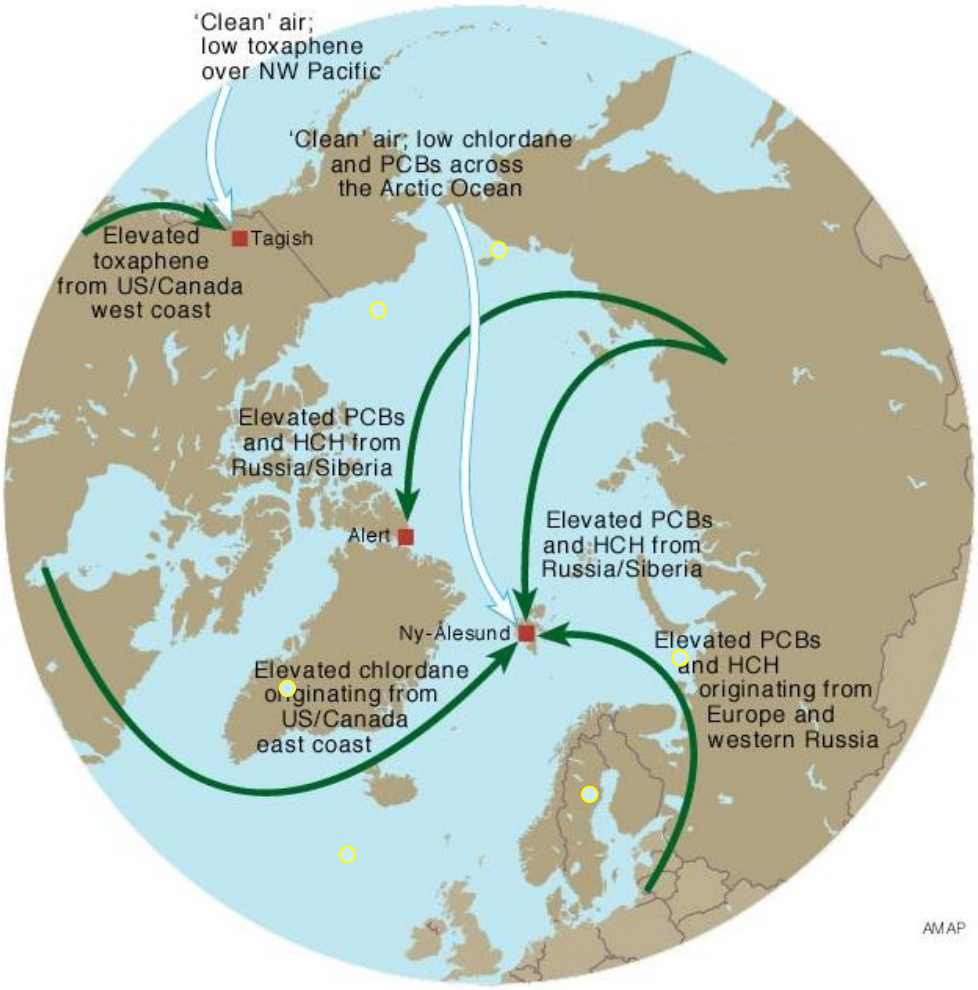
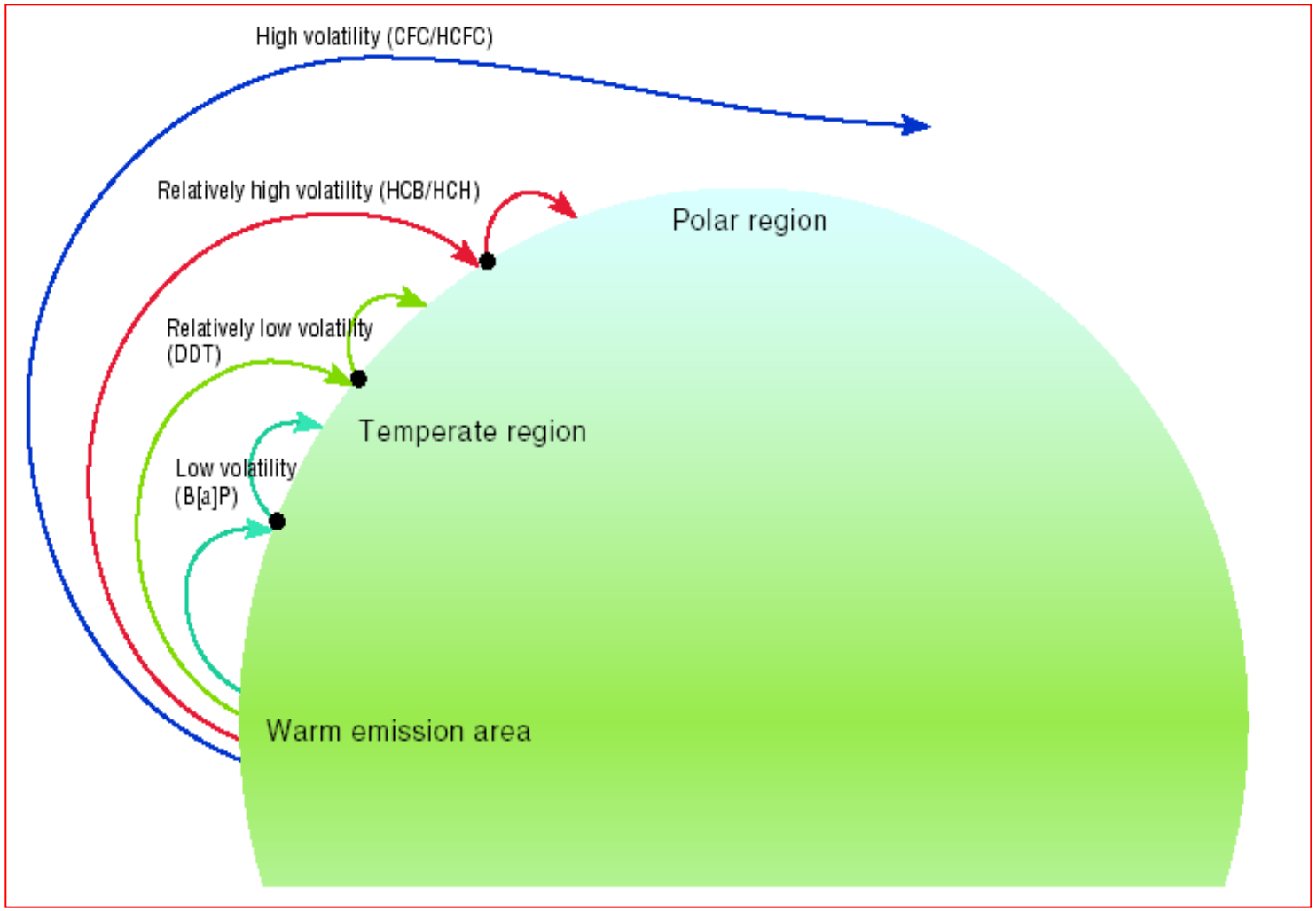
Long-range atmospheric transport

Persistent Organic Pollutants (POPs)

Mainly due to LRT, but also some regional use and releases of pesticides and industrial chemicals (e.g. PCB and HCB)



Global Fractionation Hypothesis



Occurrence of POPs in the Arctic

Iñupiat, Anaktuvuk Pass, Alaska.

Dene, Midway Lake, NWT, Canada.

Saami, Kautokeino, Norway.

Chukchi, Kanchalan, Russia.

Convention on Long-range Transboundary Air Pollution and its POPs Protocol

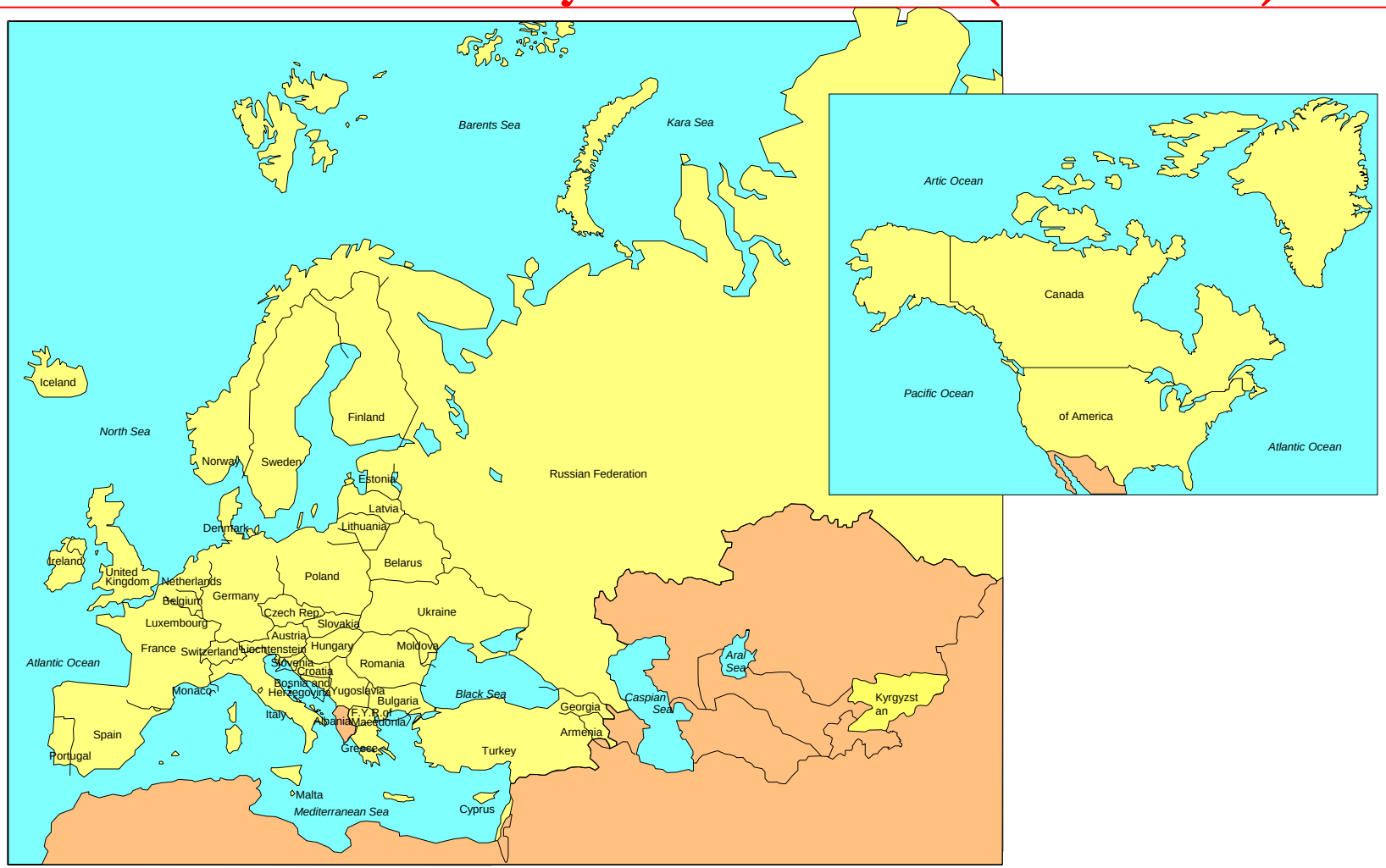
http://www.unece.org/env/lrtap (for general information)

http://www.unece.org/env/wgs (for documents)

HERALDING 20 YEARS OF INTERNATIONAL COOPERATION TO REDUCE AIR POLLUTION

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

The coverage of the Convention on Long-range Transboundary Air Pollution (49 Parties)

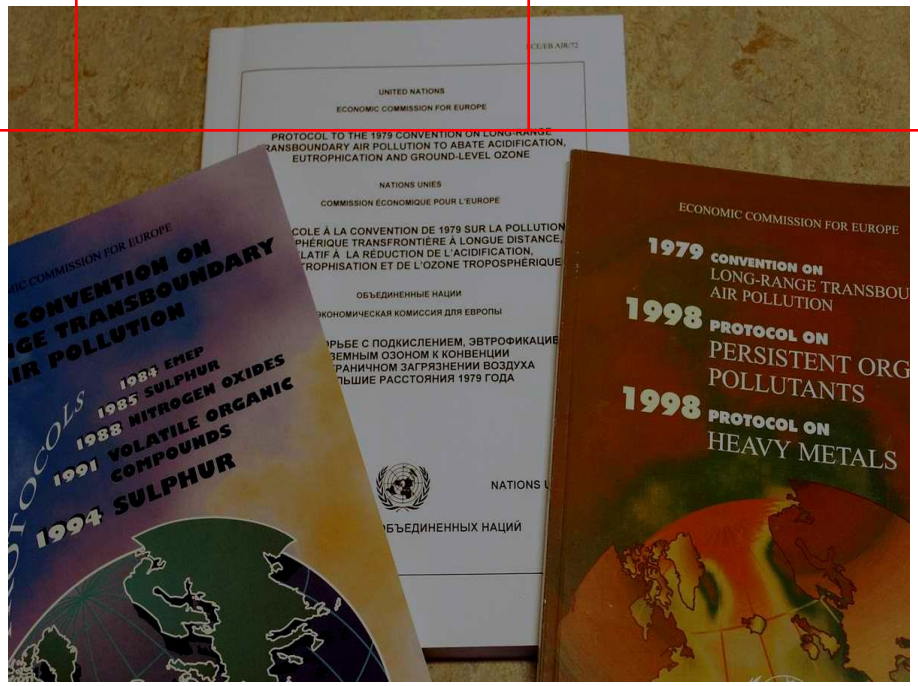


The Protocols in force

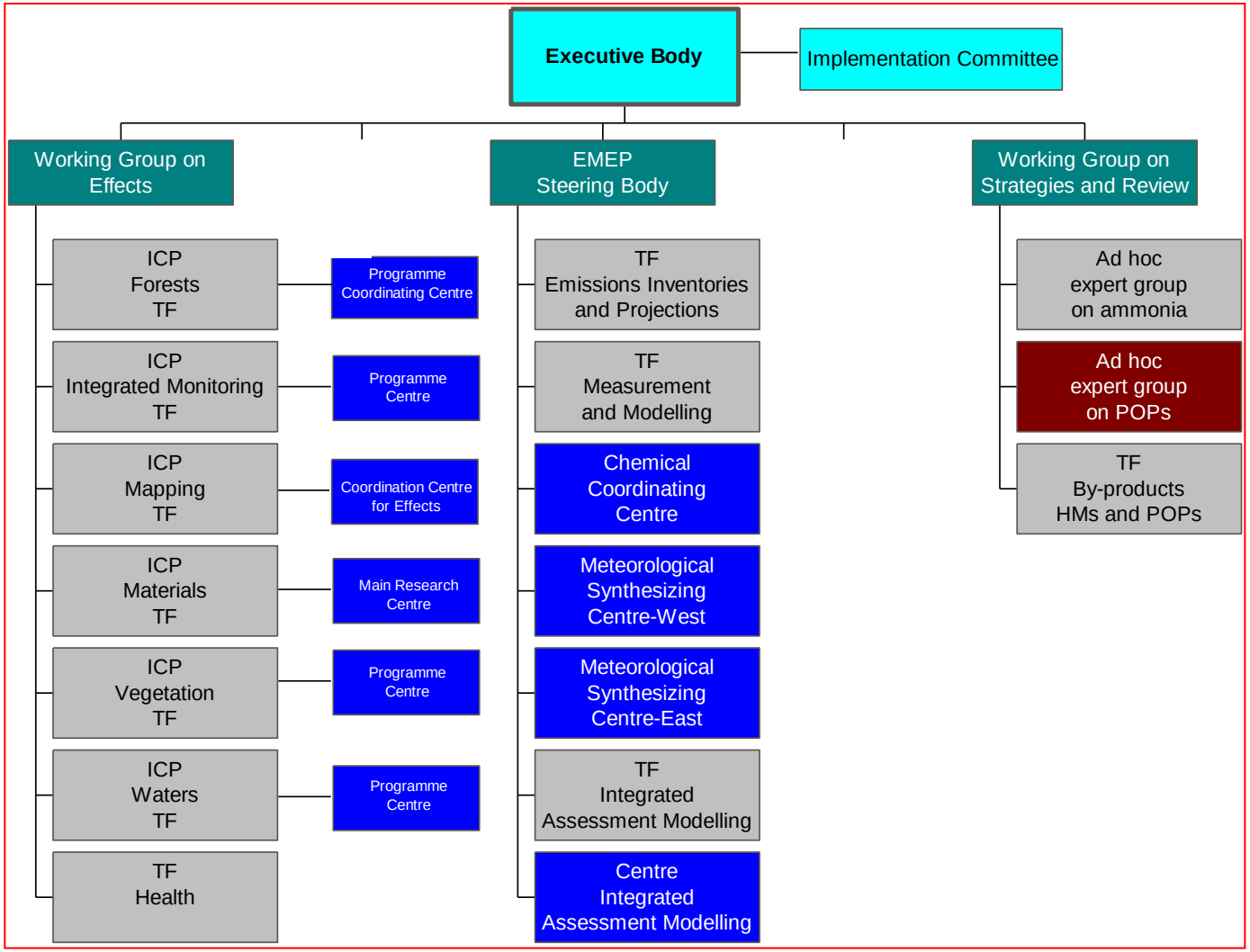
Geneva 1984	**EMEP** Protocol	40 Parties	Cost-sharing of monitoring and evaluation work
Helsinki 1985	**Sulphur** Protocol	22 Parties	Flat-rate reduction (30%) of 1980 emissions by 1993
Sofia 1988	**NOx** Protocol	28 Parties	Flat-rate, stabilization of 1987 emissions by 1994, BAT requirements
Geneva 1991	**VOC** Protocol	21 Parties	Flat-rate reduction (30%) by 1999, optional base year, stabilization for low-emission areas, BAT requirements
Oslo 1994	**2nd Sulphur** Protocol	25 Parties	Effects-based emission ceilings (acidification), mandatory limit values for major sources

The new Protocols

Aarhus 1998	**Heavy Metals** Protocol	36 Signatories, 17 ratifications	Stabilize emissions of cadmium, lead and mercury; limit values for major sources
Aarhus 1998	**POPs Protocol**	36 Signatories, 17 ratifications	Stabilize emissions of PAH, dioxins/furans and HCB; phase out selected pesticides, limit values for major sources

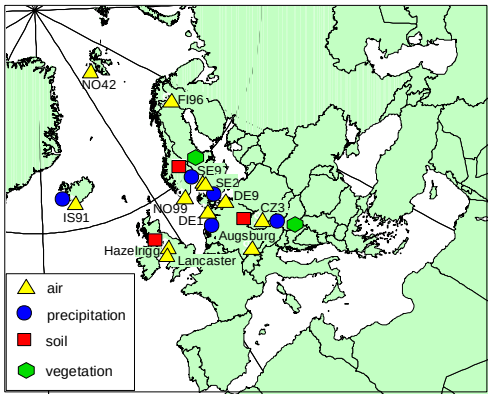


Intergovernmental bodies, expert groups and scientific centres under the Convention



Superstation concept - Observatory Košetice, CR

EMEP POPs Network



Integrated POPs monitoring - Observatory Košetice

Comparison of existing programmes (EMEP, GAPS, MONET) and approaches (active vs. passive)

Integrated Atmospheric Deposition Network (IADN)

- 1992 – now
- Canada-US network
- Bi-national Steering Committee
- 5 year implementation plan
- International peer-review every 5 years
- Atmospheric loadings and trends of toxic chemicals in air and precipitation
- 5 master stations