



Setting the Context: State of the Art of Rotterdam, Basel and Stockholm Convention

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Content of Presentation

- **Why Chemical Conventions**
- **Short overview on Stockholm, Rotterdam and Basel (BRS) Conventions: Aims and limitations of these Chemical Conventions.**
- **Synergy process of BRS Conventions**
- **Strategic Approach on International Chemical Management (SAICM)**

An Early Globalisation in 1960s/70s:

Contamination by Persistent Organic Pollutants !

Discovery 1960s/70s: chlorinated chemicals which did not degrade in environment (persistent) were found to cause local disturbance of ecosystems including extinction of birds, fishes, reptiles.

Discovery 1990s: Global pollution by POPs

“The dirty dozen”

PCDD
PCDF
PCBs
DDT

Aldrin
Chlordane

Dieldrin

Endrin

HCB

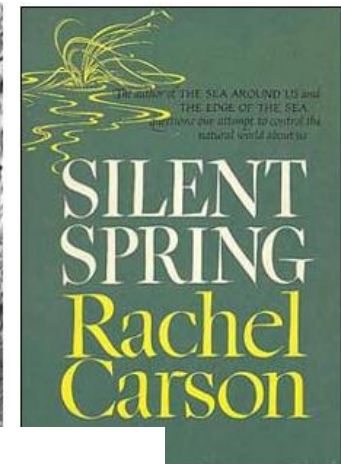
Heptachlor

Toxaphene

Mirex

Persistent Organic Pollutants

- Persistent in environment & in organism/body
- Toxic to humans/biota
- Mobile in the environment



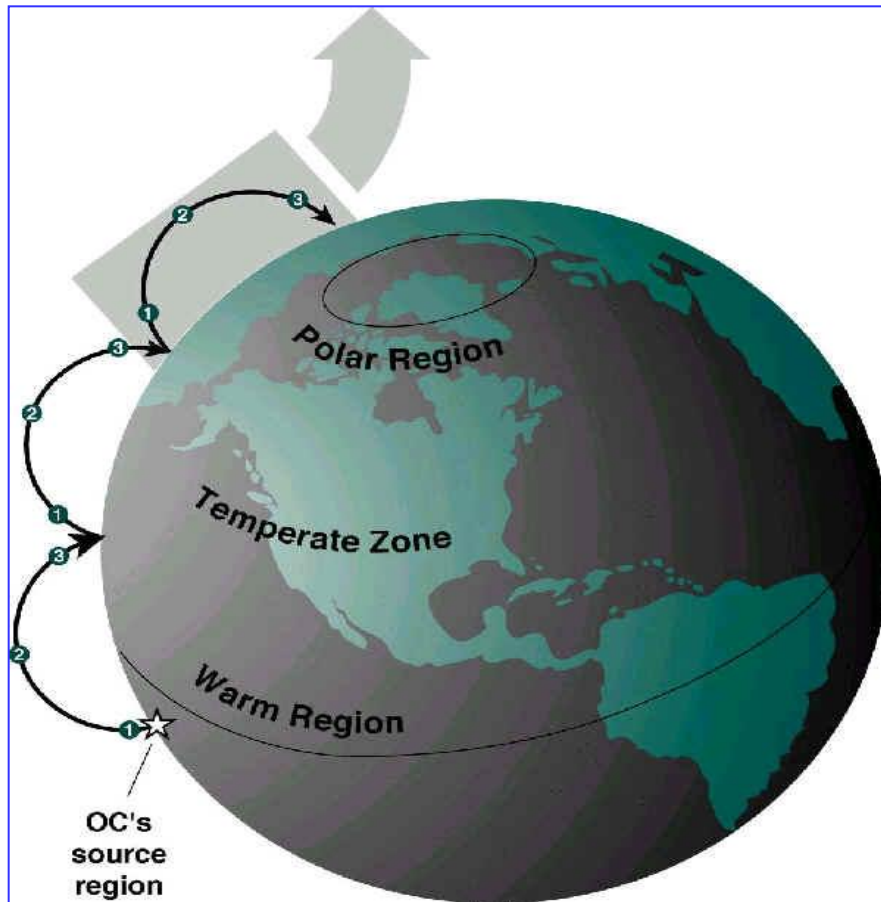
Late lessons from early warnings – the precautionary principle

http://www.eea.europa.eu/publications/environmental_issue_report_2001_22

<http://www.eea.europa.eu/publications/late-lessons-2>

Persistent Organic Pollutants (POPs) Environmental/Transboundary Movement

Persistent Organic Pollutants (e.g. PCB, Dioxins, POPs-Pesticides)



„Grashopper Effect“

1. Evaporation
2. Atmospheric movement
3. Deposition/condensation

„Travel the globe“ and accumulate
in colder region

⇒ Contamination of the Arctic

POPs Environmental/Transboundary Movement Contamination of the Arctic



- ⇒ Accumulation in the arctic (arctic population eats fatty food)
- High levels of contaminants in humans and human milk.
 - High cancer rates; Girl/boy ratio > 1 (Similar effect Seveso).

Source: Guardian 12 Sep 2007 <http://www.guardian.co.uk/world/2007/sep/12/gender.sciencenews>

These people have not used these chemicals but are contaminated from the production use and sale from industrial countries.

⇒ This global pollution and the inherent injustice can only be addressed by a global approach.

Film “Silent Snow“ (Jan van den Berg): www.silentsnow.org/

Global/Multilateral Environmental Agreements

- The challenge of transboundary transport of POPs or ODS can only be addressed and solved by international approaches.
- Also the management and control of hazardous waste needs an international frame that these expensive and polluting wastes do not end in developing countries with associated pollution.
- Therefore over the last three decades Global and Multilateral Environmental Agreements were developed.

„Agreements between countries to take global/regional actions when the world/region has an environmental problem which can only be solved by collaboration of the countries“

Scope of Global Chemical MEAs

Agreement	Scope	Enforced
Vienna Conv. Montreal Prot.	Protection ozone layer by phase out ozone-depleting substances	1985 1987
Basel Convention.	Control of Transboundary Movements of Hazardous Wastes & their Disposal	1992
Rotterdam Convention	Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	2004
Stockholm Convention	Elimination of POPs for the protection of human health and environment	2004
Minamata Convention	Elimination of mercury for protection of human health and environment	2013
SAICM	Integrated Chemical Management	2006



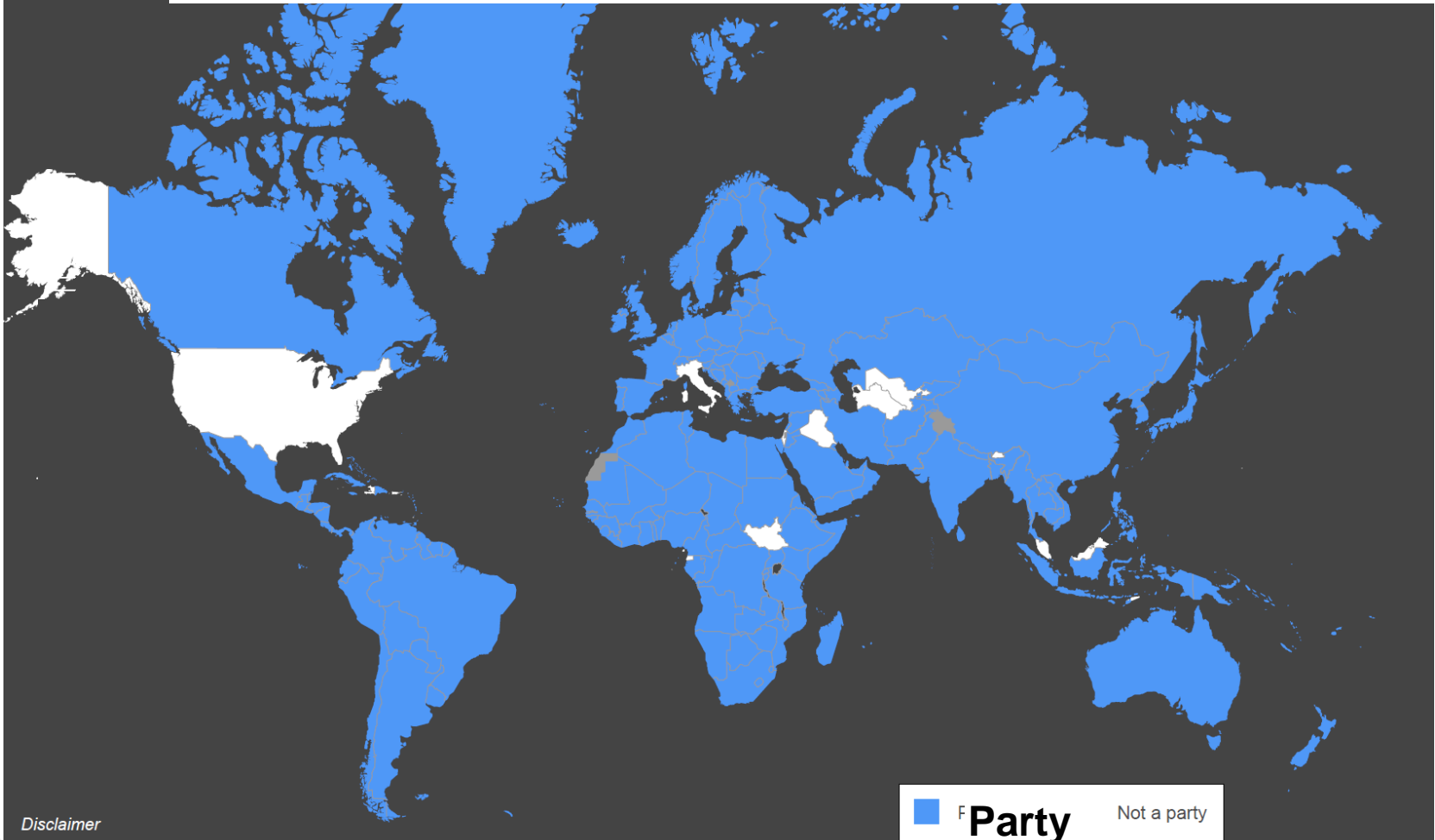
Stockholm Convention

(opened 2001; adopted 2004; www.pops.int)

Reason: Global transboundary contamination of human and environment with persistent organic pollutants.

tool by ammap.com

179 Parties ratified the Stockholm Convention (02/2015)



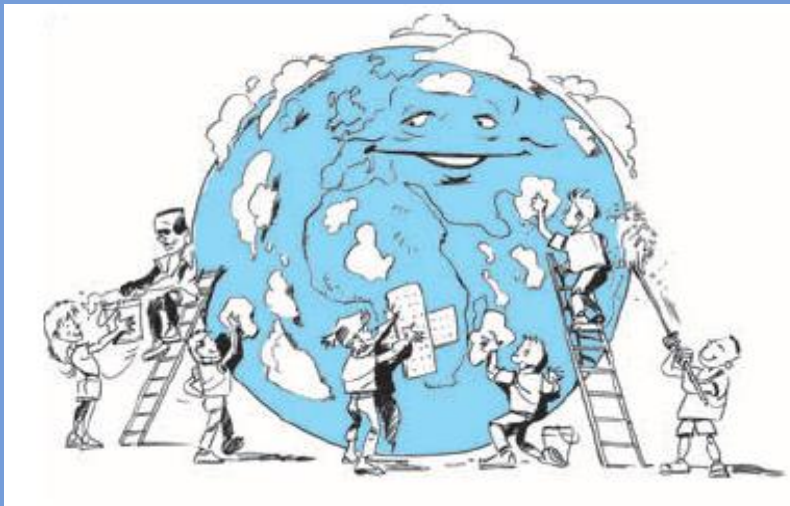
Disclaimer



Stockholm Convention: Global Action Towards Risk Reduction of POPs

Objective of the Stockholm Convention (Art 1):

“Mindful of the **precautionary approach** as set forth in Principle 15 of the Rio Declaration on Environment and Development, the objective of this Convention is **to protect human health and the environment from persistent organic pollutants.**”

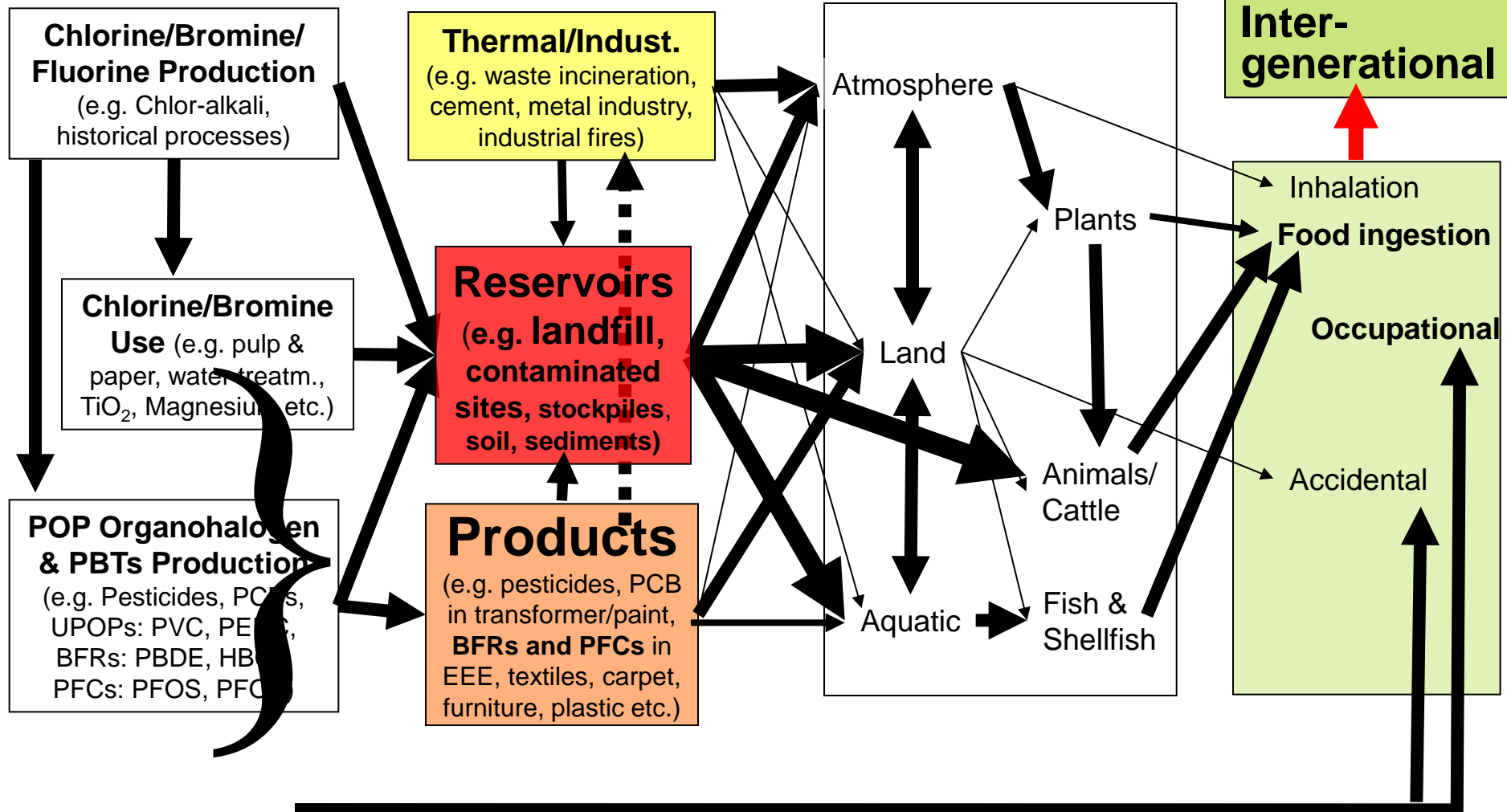


"Life-Cycle" of POPs/PTS and Human Exposure

Emission Sources

Environmental Transport

Exposure Routes

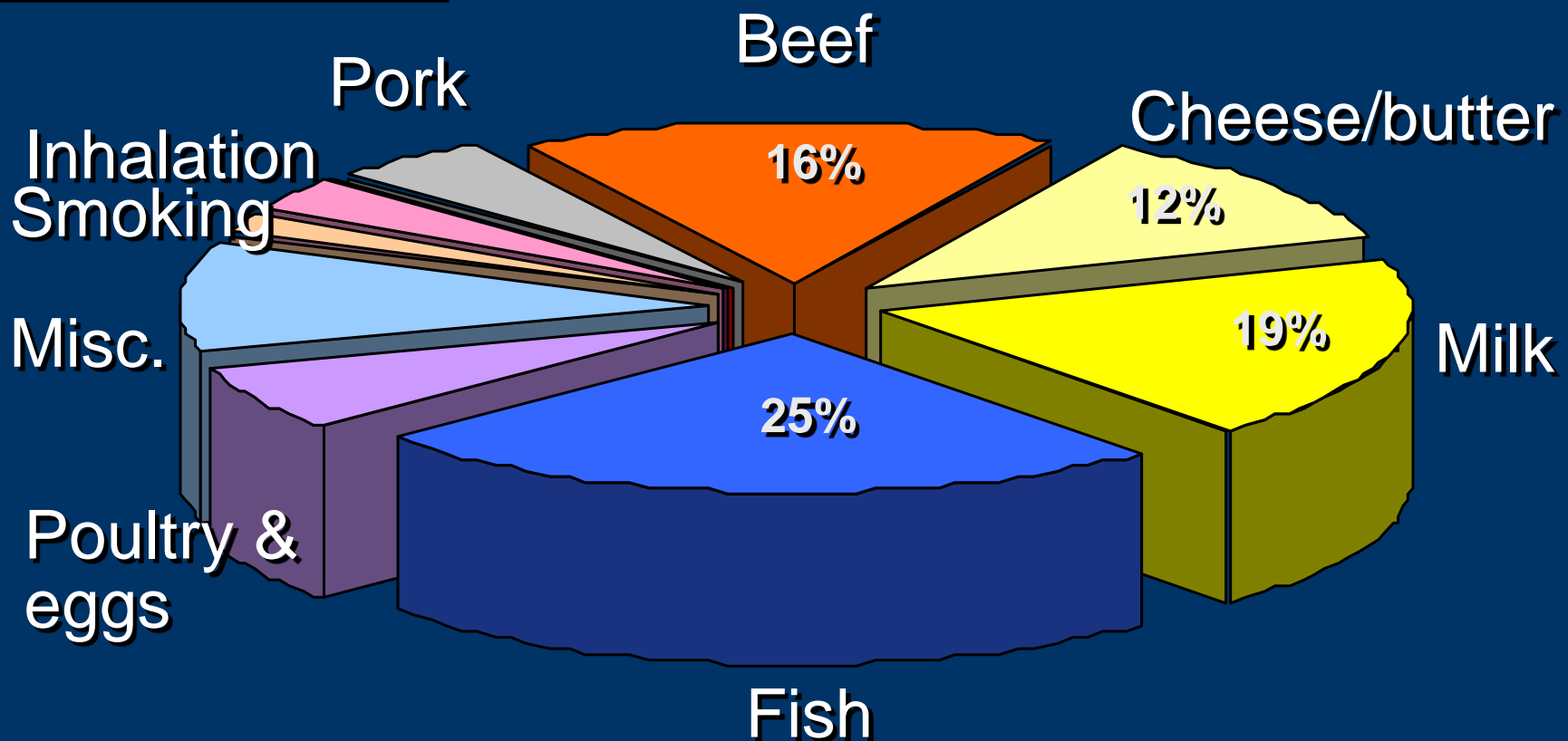


Human Background Exposure old POPs

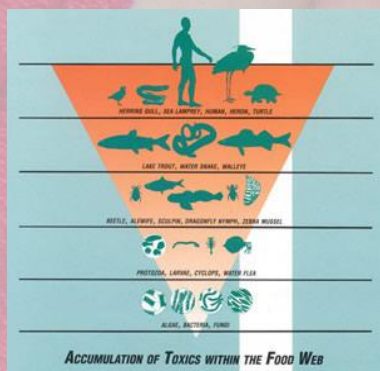


Human Dioxin exposure routes U.S.A.

- POPs are ubiquitous in fatty food
- Bioaccumulate in top predators
- Depends on lifestyle



PCDD/F, PCB, DDT (& other endocrine disruptors) are especially critical during human development (lowest dose response conc.).



Top of the Foodchain:

Women accumulate POPs during their life and pass them to the baby during pregnancy and by breast milk

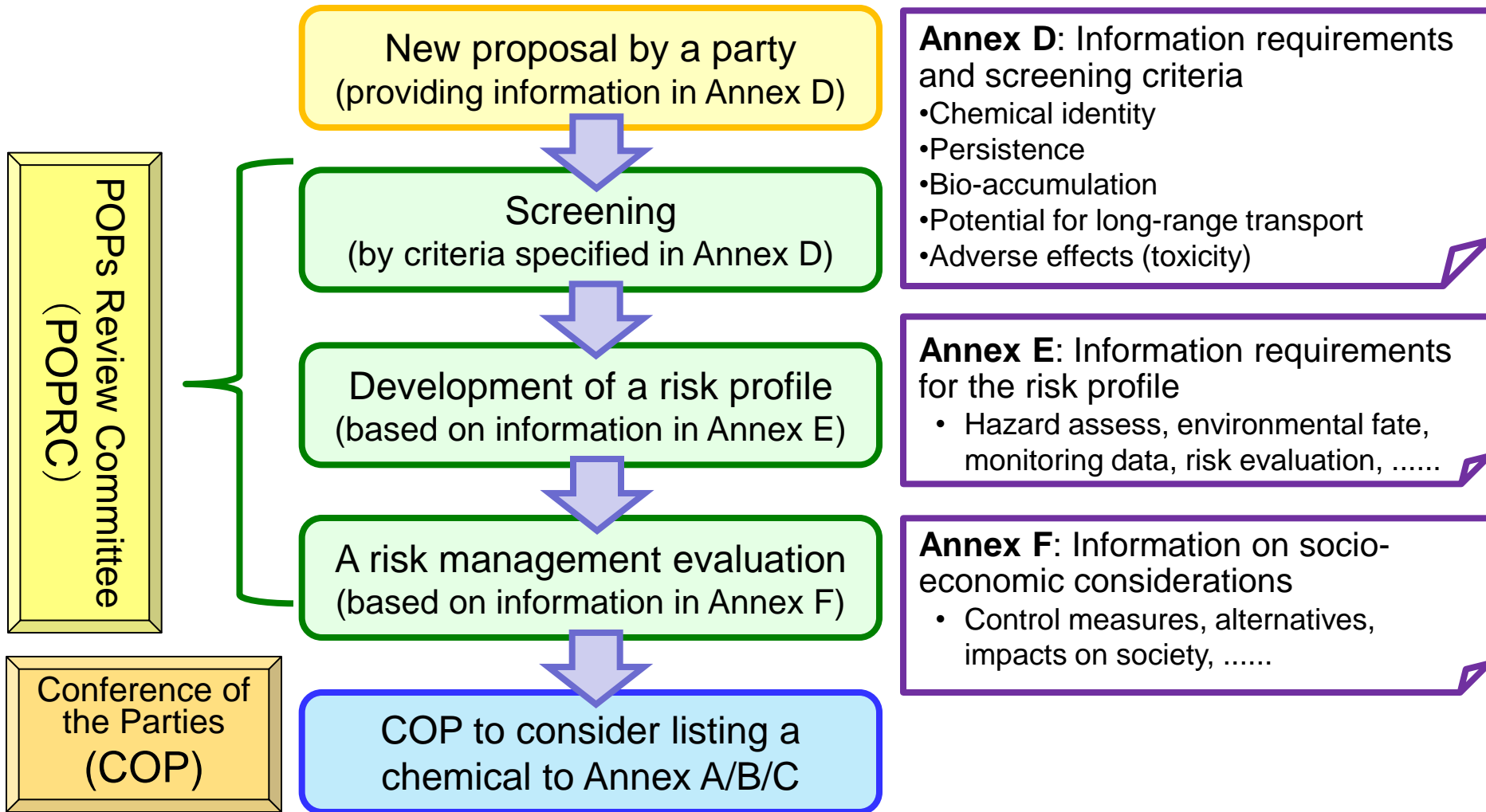
-Still best to use mothers milk the first 6 month! (WHO)



Original POPs in Stockholm Convention¹⁴ and the UN ECE POPs Protocol

	Pesticides	Industrial Chemical	U-POPs
Aldrin	+		
Chlordane	+		
DDT	+		
Dieldrin	+		
Endrin	+		
Heptachlor	+		
Mirex	+		
Toxaphene	+		
Hexachlorobenzene	+	+	+
PCB		+	+
PCDD			+
PCDF			+
PAH			+

Process to Assess Candidate POPs



9 + 2 new POPs were added to the Convention in 2009 - 2013

Chemical	Pesticides	Industrial chemicals	Unintentional production	Annex
Chlordecone	+			A
Lindane	+			A
Alpha hexachlorocyclohexane	+		By-product of lindane By-product of lindane	A
Beta hexachlorocyclohexane	+			A
Endosulfan	+			A
Commercial pentabromodiphenyl ether		+		A
Certain congeners Commercial octabromodiphenyl ether		+		A
Hexabromobiphenyl		+		A
Hexabromocyclohexane		+		A
Perfluorooctane sulfonic acid (PFOS), its salts and PFOSF	+	+		B
Pentachlorobenzene		+	+	C

Chemicals suggested for listing in next COP: Polychlorinated Naphtalene (PCN), Hexachlorobutadiene (HCBd), Pentachlorophenol (PCP)

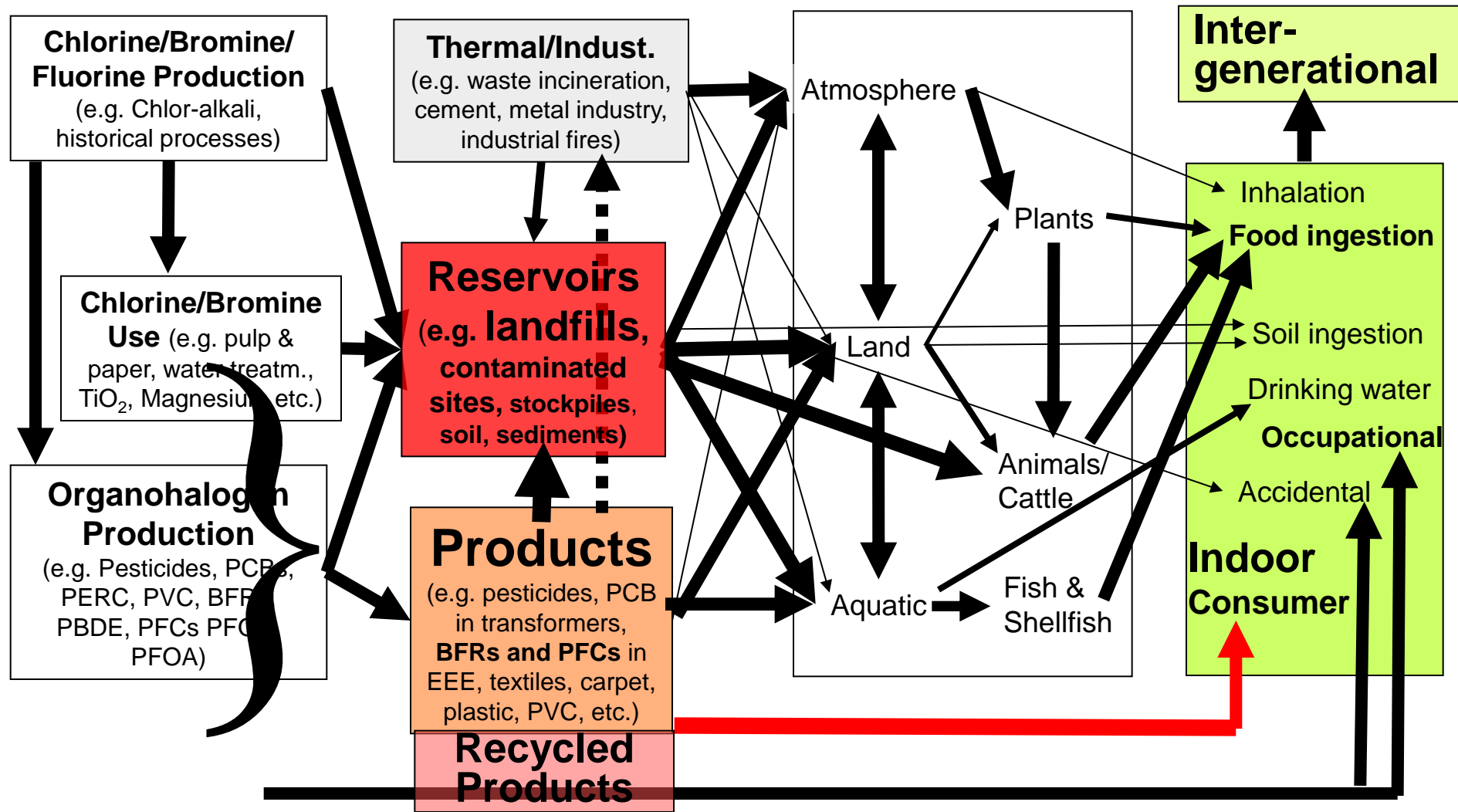
Chemicals in the reviewing process: SCCP, DecaBDE, Dicofol.

"Life-Cycle" of new listed POPs/PTS used in Consumer Goods and Human Exposure

Emission Sources

Environmental Transport

Exposure Routes



Stockholm Convention: Global Action Towards Risk Reduction of POPs

Approaches and activities for control

- Eliminate or restrict the production, use, import & export of POPs
- Reduce releases from unintentional POP production
- Promote BAT/BEP to reduce POP emissions
- Eliminate POPs stockpiles and wastes
- Procedure for adding new POPs for action
- General obligations
- Mechanism for financial and technical assistance
- Information exchange by a Clearing House Mechanism



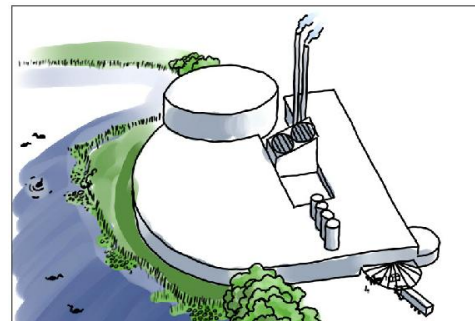


Stockholm Convention - challenges

STOCKHOLM
CONVENTION

Short comings:

- Many “dead chemicals” not produced and used.
- Too small funding for the tasks (e.g. PCB and Pesticide stockpiles; country versus GEF financing ratio 4:1).
- BAT/BEP difficult to address by PCDD/F as prime pollutants (can not be monitored in most countries; not a parameter measured continuously but only by spot measurements).
- Limited coverage of chemicals.
- New listed POPs PFOS and PBDE got exemptions for relevant applications.





Stockholm Convention - challenges

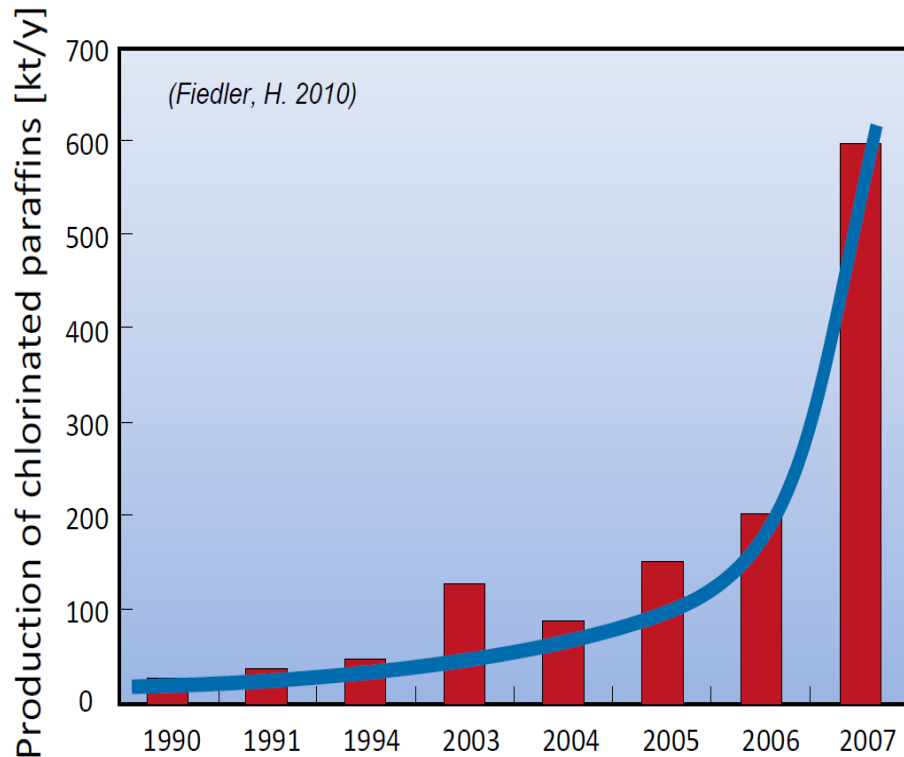
STOCKHOLM
CONVENTION

Major challenges of PCB management

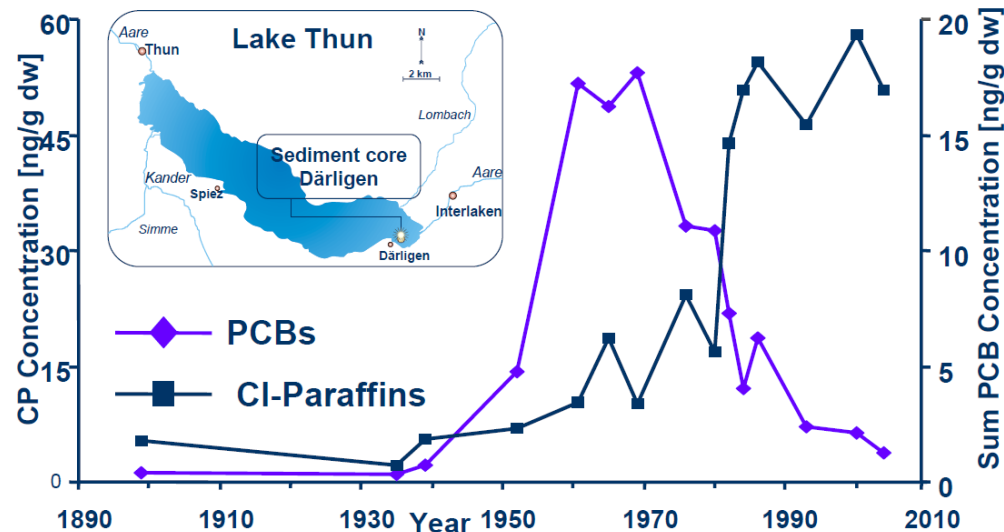
- In most developing countries no or limited analytical capacity and therefore transformer are still not assessed and PCB oils dispersed.
 - POPs-like chemicals can not be managed in developing countries having no or limited destruction capacity. ⇒ export @3000 - 5000\$/t.
 - The management cost of 3 mio tonnes PCB contaminated materials can be estimated to 9 to 15 billion \$. Budget financing chemicals & waste GEF 5 (2007-14; \$425 mio) and GEF 6 (2015-20; \$554 mio).
 - SC/Europe only address closed PCB applications. However for e.g. Germany the relevant PCB pollution stem from open applications.
- ⇒ PCBs are currently not adequately addressed. PCBs and other POPs can not be managed in most countries. ⇒ **Substitution.**
- Some of the PCB alternatives used were/are POP-like chemicals (e.g. polychlorinated terphenyls, chlorinated paraffins, PCNs).

PCB Substitutes open applications: Chlorinated paraffins

- Chlorinated paraffines have substituted PCBs in a range of open applications (e.g. paints, cutting oils, sealants, flame retardants, softeners).



- Production increase of 1000% in last 10 years. Volume > 1 mio t/a primarily China & India. Similar to the total historic PCB production!!



- Malisch (WHO laboratory; Dioxin 2013) Global CP-contamination human milk!

⇒ **Need of better substitution and life cycle management !**

PFOS - Acceptable Purposes SC

(SC: Currently no alternatives are available)

- Metal plating in closed loop systems,
- Fire fighting foam (e.g. air port, oil, refineries),
- Insect baits for control of leaf-cutting ants.
- Photo imaging,
- Photo resist and anti-reflective coatings for semi-conductors,
- Etching agent for semi-conductors and filters,
- Aviation hydraulic fluids (Rec?),
- Certain medical devices (e.g. ETFE layers, radio-opaque ETFE, in vitro diagnostic medical devices, CCD color filters),



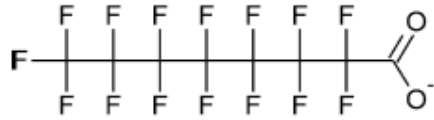
Some alternative Chemical Groups to PFOS and related chemicals

- **Non fluorinated alternatives**
 - Siloxanes and silicone polymers
 - Hydrocarbons (Propylated naphthalenes/biphenyls Fatty alcohol polyglycol ether sulfate Sulfosuccinate hydrocarbons)
- **Often other Per-/Poly-Fluorinated Compounds**
 - C6: Six fluorinated carbon functionality compounds
 - C4: Four fluorinated carbon functionality compounds - Perfluorobutane sulfonate (PFBS) [Shorter chain perfluoroalkyl sulfonates]
 - Longer chain polyfluorinated alcohols
 - Polyfluorinated ether functionality compounds (e.g., CF₃ or C₂F₅ fluoroalkyl polyethers); fluorinated oxetanes
 - Other fluorinated polymers

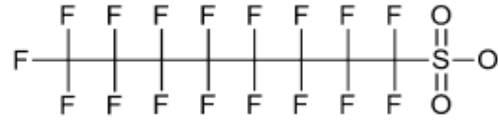
Scheringer, Weber, Fantke (2014) How to avoid lock-in problem?

Organohalogen Compounds <http://www.dioxin20xx.org/pdfs/2014/976.pdf>

Some Functional PFAS Structures



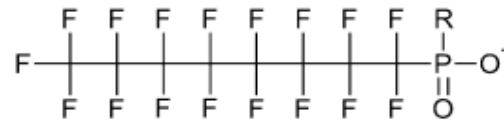
Perfluorocarboxylic acids
(ex. PFOA)



Perfluorosulfonic acids
(ex. PFOS)



Fluorotelomer alcohol
(ex. 8:2 FTOH)



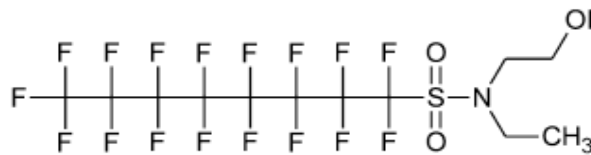
Perfluorophosphonic/phosphinic acids
(ex. If R=OH then PFOPA
If R=C8 perfluoroalkane then 8:8 PFPi)



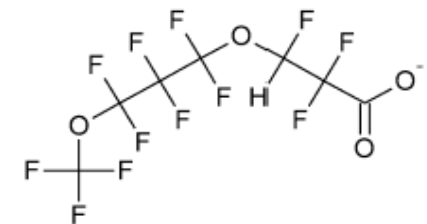
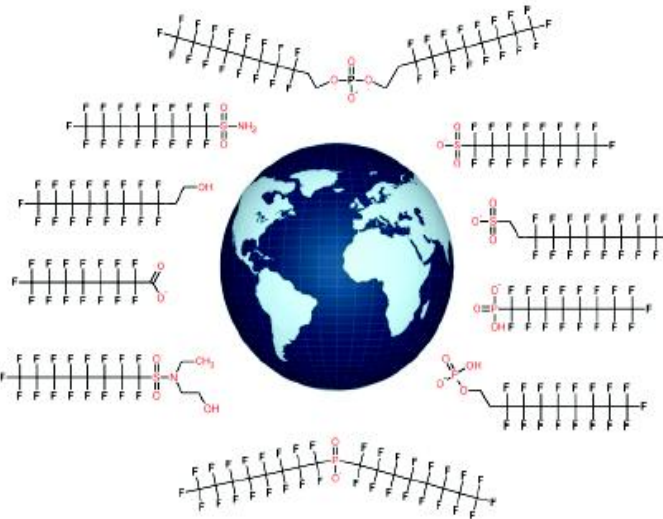
Perfluorosulfonamide
(ex. FOSA)



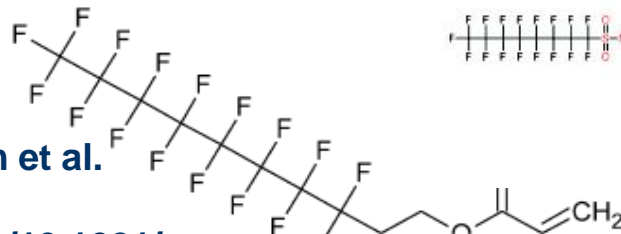
Perfluorinated cyclo sulfonates
(ex. PFECHS)



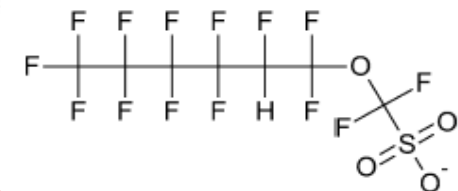
Perfluorosulfonamidoethanol
(ex. N-EtFOSE)



Polyfluorinated ether carboxylates
(ex. 4,8-dioxa-3H-perfluorononanoate)



Polyfluorinated polymeric unit
(ex. 1H,1H,2H,2H-perfluorodecyl acrylate)



Polyfluorinated ether sulfonates
(ex. Perfluoro [hexyl ethyl ether sulfonate])

**Today about 1000 PFAS
on the market**

Lindstrom et al.
ES&T
[dx.doi.org/10.1021/
es2011622](https://doi.org/10.1021/es2011622) (2011)

POPs and other PBT chemicals in products

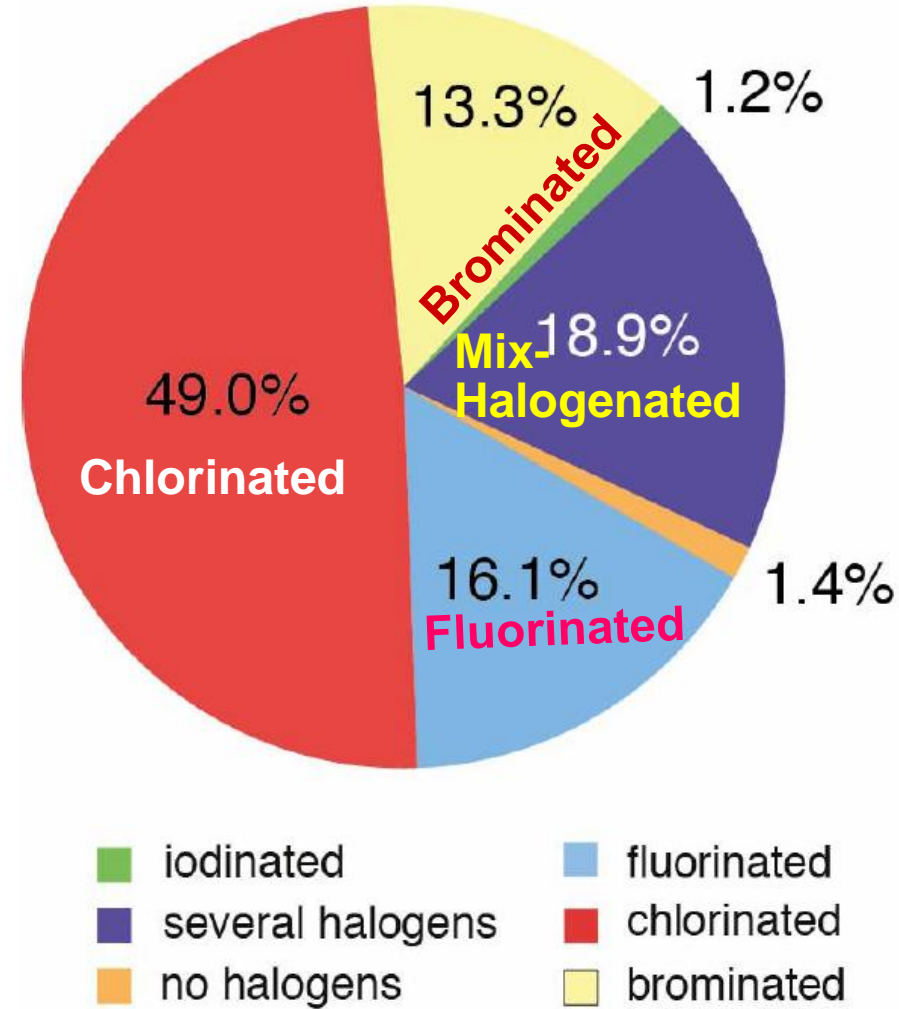
– Management challenges and support

- POPs with exemptions are still produced/used (PFOS, HBCD) or are still in use and recycling (PCB, PBDE) or are unintentionally present in products (e.g Dioxin in certain pesticides; PCB in certain pigments).
- For new POP in products no/limited measurement standards exist.
- A major exposure comes from exposure to chemicals in products (CIP). This includes consumers but also occupational exposure.
- Situation need considerable improvement. EU REACH for chemicals. However challenge with chemicals in products – they need a better control and a better regulatory frame for life cycle management.
- Government approach long chain PFAS: US EPA mix of regulation and voluntary phase out (2010/2015 PFOA stewardship program) (<http://epa.gov/oppt/pfoa/pubs/stewardship/index.html>)
- NGOs and scientists (e.g. Greenpeace DeTox campaign for clean cloth production <http://www.greenpeace.org/international/en/campaigns/detox/> Madrid Statement on PFAS <http://greensciencepolicy.org/madrid-statement/>)

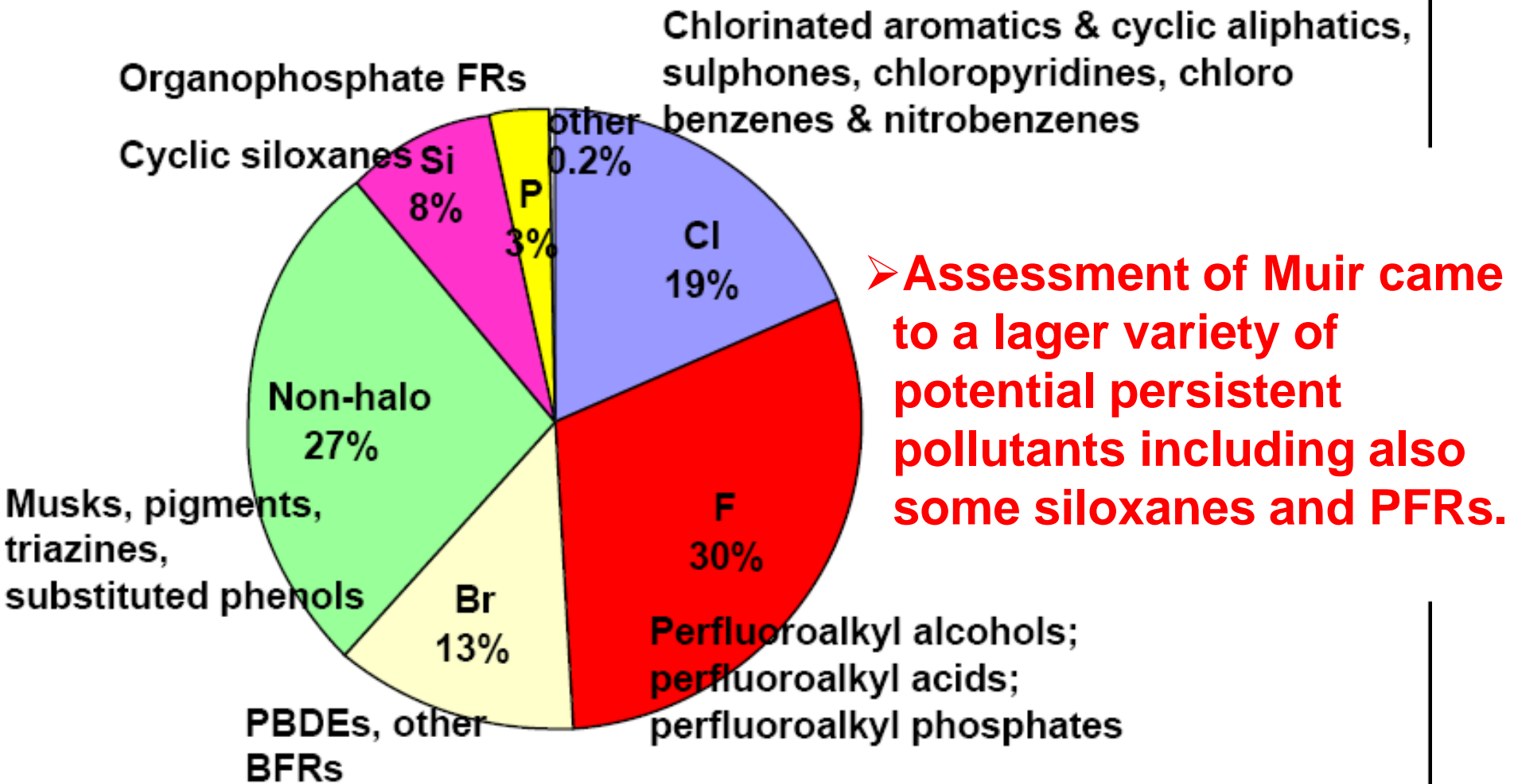
Many potential POPs in use today

- Today hundreds of chemicals in use have POPs-like/PBT properties and many of them are used in consumer goods (e.g. EEE, textiles, furniture, synthetic carpets, paper).
- PBTs in consumer goods pose risk for human health, the environment and the recycling/recovery flows.
- Often POPs have been substituted by other POPs-like chemicals.
- Need for a better substitution approach of POPs/haz. chemicals
- The use of sustainable alternatives would reduce the risk for recycling and the generation of hazardous wastes.

574 Potential POPs/PBTs



Classes of 610 Priority Pollutants



Source: Muir, Presentation Dioxin 2010, San Antonio, September 2010.

Stockholm Convention: Alternatives

- The POP Reviewing Committee (POPRC) adopted a "Guidance on considerations related to alternatives and substitutes for listed persistent organic pollutants and candidate chemicals". It intended to provide general guidance on the identification and evaluation of alternatives to the chemicals listed in the annexes to the SC or proposed for listing in the annexes.

<http://chm.pops.int/Implementation/POPsFree/OtherInitiativesandGuidance/tabid/2442/Default.aspx>

- POPRC developed alternative guidance on alternatives to PFOS and related chemicals. POPRC agreed on 10th meeting that it should be revised regularly.
- POPRC also developed a report on chemical alternatives to endosulfan & DDT and non chemical alternatives to endosulfan.
- A publication on "POPs phase out opportunities" has been compiled including alternatives to all POPs chemicals and approaches to assessment alternatives. <http://poppub.bcrc.cn/>

POPs and other toxic chemicals in use – BRS management support and challenges

- Within Stockholm Convention, guidances were developed for Best Available Technology (BAT) and Best Environmental Practices (BEP) (unintentional POPs, PFOS, POP-PBDEs)
- Due to the listing of acceptable purposes and specific exemptions for PFOS in a wide range of technical processes and application in articles resulted in the need to define BAT/BEP.
- For PBDEs an exemption for recycling of PBDE containing material. Therefore a guidance for the recycling of these materials were developed.
- These guidances and information should be used in countries, assessed and improved.

Guidance on best available techniques and best environmental practices for the recycling and disposal of articles containing polybrominated diphenyl ethers (PBDEs) listed under the Stockholm Convention on Persistent Organic Pollutants

Guidance on best available techniques and best environmental practices for the use of perfluorooctane sulfonic acid (PFOS) and related chemicals listed under the Stockholm Convention on Persistent Organic Pollutants

Draft
July 2012





Rotterdam Convention

Rotterdam Convention on the Prior Informed Consent (PIC)

Procedure for Certain Hazardous Chemicals in International Trade

(Adopted 10.09.1998; effective on 24.02.2004; www.pic.int)

- Reason: dramatic growth in chemicals trade, and vulnerability of developing countries to uncontrolled imports.
- Objective: Control of chemical trade of certain hazardous chemicals by “Prior Informed Consent Procedure” in international trade in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use.
- Requires exporters trading of listed hazardous substances to obtain the prior informed consent of importers before proceeding with the trade.



Rotterdam Convention

Meeting the Objectives

- Provides an early warning of a few hazardous chemicals
- Provides the basis for decisions regarding of future imports of these chemicals (PIC procedure)
- Helps to enforce those import decisions



Rotterdam Convention

Key provisions

- **PIC procedure** - Provides for a national decision making process on import of hazardous chemicals in Annex III and attempts to ensure compliance with these decisions by exporting Parties
- **Information exchange** - the exchange of information on a broad range of potentially hazardous chemicals



Rotterdam Convention

Scope of the Convention

Applies to:

- Chemicals **banned or severely restricted** to protect human health and the environment
- **Severely hazardous pesticide formulations (SHPF)** - causing problems under conditions of use in developing countries or countries with economies in transition



Rotterdam Convention

Hazardous pesticides:

2,4,5-T, aldrin, azinphos-methyl, binapacryl, captafol, chlordane, chlordimeform, chlorobenzilate, DDT, 1,2-dibromoethane (EDB), dieldrin, dinoseb, DNOC and its salts, ethylene dichloride, ethylene oxide, fluoroacetamide, HCH, heptachlor, hexachlorobenzene, lindane, mercury compounds, monocrotophos, parathion, pentachlorophenol and toxaphene, plus certain formulations of methamidophos, methyl-parathion, monocrotophos, parathion, phosphamidon, and a combination of benomyl, carbofuran and thiram.

Industrial chemicals:

asbestos (actinolite, anthophyllite, amosite, crocidolite, tremolite), c-PentaBDE c-OctaBDE, polybrominated biphenyls (PBBs), polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs), tris (2,3 dibromopropyl) phosphate, tetraethyl lead (TEL) & tetramethyl lead (TML), PFOS and related chemicals,

Substances proposed for addition to the Convention:

Paraquat dichloride, chrysotile asbestos, trichlorfon



Rotterdam Convention

Weaknesses/Challenges:

- Very limited funds
- Small coverage of chemicals
- Failed in the attempted to include Chrysotile-asbestos:
 - In 2006: Consensus necessary but Canada and India voted against inclusion due to personal interests (Canada produces and exports and Indien imports for construction) India requested more data for proof of carcinogenic potential of Chrysotile-asbestos (although the data are sufficient!).
 - In 2013: Several countries (mainly producing countries) voted against inclusion and no consensus was reached



Basel Convention

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

(Adopted 22.03.1989, effective 05.05.1992; 179 Parties; www.basel.int)

Reason:

- Concerns about dumping hazardous wastes in developing countries.
- Due to tighter environmental regulations in industrial countries since the 1970s/1980s an increased exports of hazardous waste from industrial countries to developing countries. “Toxic traders” searching for cheaper solutions shipping hazardous wastes to Africa, Eastern Europe etc.
- High profile chemical accidents (Seveso wastes transboundary move)
- Public’s attention in the 1980s (Basel Action Network www.ban.org).



Basel Convention

Key Objectives:

- The goal of the Convention is to protect human health and the environment from the adverse effects which result from inappropriate management of hazardous and other wastes.
- Control of transboundary movements of hazardous wastes and their disposal
- This includes handling, transporting, storing, treating, processing and the disposal of these wastes (environmentally sound management of hazardous waste).

Basel Convention

Why the Basel Convention matters:

- In a project carried out by 13 European countries in 2006 (IMPEL/TFS), over 50% of the waste shipments verified in ports were illegal. If that is the case for only 13 European countries, how big is the global problem?
- Reports to the Basel Convention suggest that there are at least 8.5 million tonnes of hazardous waste moving from country to country each year (The shipments known).
- Overall estimates for global volumes of hazardous waste: 300 to 500 million tonnes

(Kern M., Basel Convention Secretariat)

Known and Suspected Routes of e-waste Dumping



There is currently no system for tracking legal or illegal (under international law) shipments of electronic waste, and therefore, there is no quantitative data on volumes or even all of the true destinations. Some electronic waste is shipped as "working equipment" only to end-up as waste upon arrival. This map indicates information collected through investigations by organizations such as the Basel Action Network, Silicon Valley Toxics Coalition, Toxics Link India, SCOPE (in Pakistan), Greenpeace and others.

Contaminated Sites from Ewaste Recycling

The primitive recycling of E-waste resulted in contaminated sites in developing countries (in particular South/East Asia and Africa)



**Open burning of e-waste, Accra, Ghana
(Photo: Kate Davison, Greenpeace)**



**Ashes from e-waste burning
covered with sand and dumped
besides the Langjiang river in
Guiyu, China
(Photo: Basel Action Network)**

Basel Convention

The Convention is based on two pillars

- A **control regime** for the transboundary movements of hazardous wastes, and
- The promotion of the environmentally sound management (ESM) of hazardous wastes. The principle of ESM addresses:
 - the treatment and disposal of hazardous wastes as close as possible to their source of generation,
 - the reduction of transboundary movements of hazardous wastes and other wastes to a minimum consistent with their environmentally sound management and
 - the minimization of the generation of hazardous wastes.



Wastes regulated under the Basel Convention

- Biomedical and healthcare wastes
- Persistent Organic Pollutant wastes (POPs wastes),
- Used oils
- Mining wastes
- Hazardous industrial wastes
- End-of-life equipments e.g.:
 - Used lead acid batteries
 - Asbestos
 - PCB equipment
 - E-wastes
 - Ships destined for dismantling.

Not controlled under Basel: ODS (Montreal); radioactive wastes



Basel Convention

What is Basel waste and disposal?

- By ratifying, Parties adopt the wastes listed in Annexes I and II of the Convention further clarified in Annexes VIII and IX.
- Parties may also inform Secretariat of additional hazardous wastes under national regulation and requirements concerning transboundary movement procedures needed for such wastes.
- “Disposal” (as defined by the Convention) includes operations resulting in final disposal and operations which may lead to resource recovery, recycling, reclamation, direct re-use or alternative uses.

(Cartagena Declaration (2011) on the Prevention, Minimization and Recovery of Hazardous Wastes and Other Wastes)

- Since material flows need to transform to a more cycle economy – waste has to be reused/recycled to the extent possible considering associated exposure (RiskCycle).

PBDE/BFR Contamination of Recycled Plastic?

- What is the flow of PBDE/BFR in recycled materials? What articles are contaminated? What are risks to human and the environment?



PBDE in carpet padding *PBDE in children toys China* *PBDE in thermo-cup* Samsonek & (DiGangi et al, OHC , 2011) (Chen et al, ES&T 43, 4200, 2009) Puype (2013) Food Add. & Contam.

- ⇒ The recycling flow of PBDE/BFR containing plastic seems largely uncontrolled. Need a better life cycle management & control!
- ⇒ Guidelines/Guidance have been developed in the frame of Basel and of Stockholm Convention on managing POP-PBDE materials.



Basel Convention

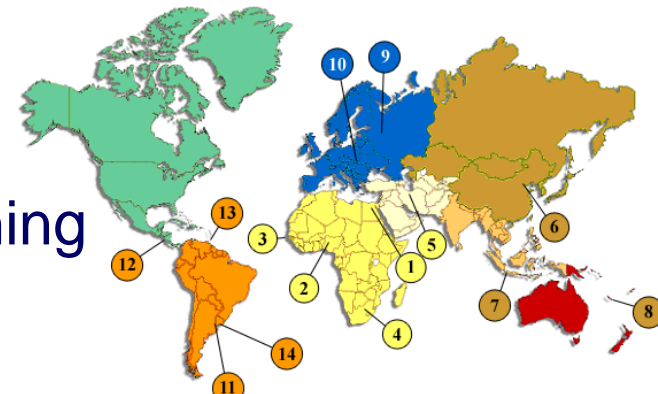
Approach of the Basel Convention

- First, the Basel Convention regulates the transboundary movements of hazardous and other wastes
 - applying the “Prior Informed Consent” procedure (shipments made without consent are illegal).
 - BAN amendment; Prohibits exports of hazardous wastes for final disposal from OECD countries to other parties (non-Annex VII countries/all other Parties); (unblocked in 2011)
 - Shipments to and from non-Parties are illegal unless there is a special agreement “Art. 11 Agreement”
 - Each Party is required to introduce appropriate national or domestic legislation to prevent and punish illegal traffic in hazardous and other wastes.
- Second, the Convention obliges its Parties to ensure that hazardous and other wastes are managed and disposed of in an environmentally sound manner (ESM).

Basel Convention

Approach of the Basel Convention

- Development of Technical Guidelines (since 1992). E.g.:
 - Environmentally sound management POPs/PCB waste
 - Environmentally sound management mercury waste
 - Environmentally sound management PFOS and PBDE wastes
 - Transboundary movement E-waste (distinction waste/non-waste)
- The Basel Declaration on Environmentally Sound Management of hazardous wastes (COP V1, 1999).
- Strategic Framework 2012-2021 (Provides a roadmap for Basel Convention implementation for the next decade and beyond).
- Partnership programs/projects
e.g. Mobile Phone, computer (PACE).
- Establishment of Regional Centres for Training and Technology Transfer (Article 14(1))





Basel Convention

Weaknesses/Challenges

- Very limited funding for implementation.
- Basel regional centers did/do not have adequate funding.
- Basel BAN Amendment (1995) unblocked only in 2011 at COP10.
- Basel Protocol on liability and compensation (1999) still not ratified.

Other waste related issues in developing countries:

- Lack of waste catalogues and inventories in developing countries.
- Lack of environmentally sound waste management capacity and destruction capacity in transition/developing countries.
- Challenge to control/guide the waste to resource concept considering the large amount of hazardous chemicals in products (RiskCycle). (need a move to greener alternatives to overcome this challenge).

Synergy between Chemical Conventions

- The BRS conventions on chemicals & wastes represent the foundation upon which to build an (adequate) global response for protecting human health and the environment from the adverse effects of chemicals and waste. This is a necessary basis for sustainable production and consumption!.
- The Conventions (could) complement and reinforce each other and potentially become an internationally agreed framework for life cycle management of hazardous chemicals and wastes.
- Potential for collaborative implementation
 - Coordinated policy development (global, regional & national)
 - Capacity-building
 - Compliance & enforcement

Synergy between Chemical Conventions

Clearing House Mechanism

The BRS Conferences developed a common systems for information exchange, including a clearing-house mechanism, with the aim of having these systems serve all three conventions.

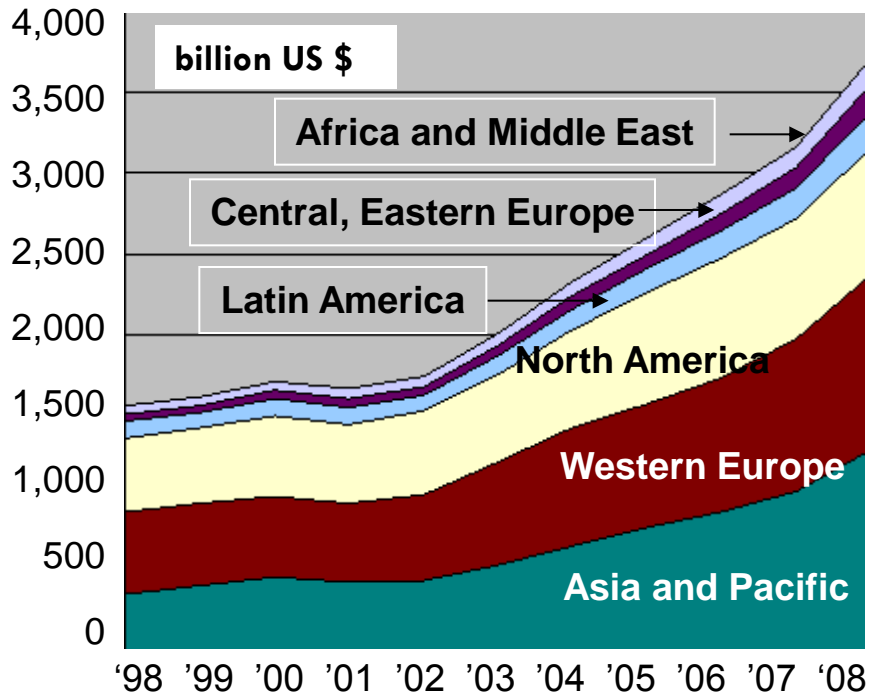
- provides one entry point to a wide range of sources of available information relevant to chemicals and wastes management;
- facilitates the sharing of information on the implementation of the BRS Conventions, including on models of coordination mechanisms and examples of good coordination practices from countries;
- facilitate the transfer of expertise & know-how between stakeholders;
- develops a unique strategy for the clearing-house mechanism;
- keeps parties and other stakeholders well informed regarding convention issues, meetings, programmes, etc.

<http://synergies.pops.int/Implementation/KnowledgeManagementandOutreach/ClearingHouseMechanism/tabid/2623/language/es-CO/Default.aspx>.

The chemical coverage of the conventions addresses only a few substances out of approx. 100,000 chemicals in use which end up in products and finally in wastes. Overall there are >20 million synthetic chemicals, increasing by >1 million a year.



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



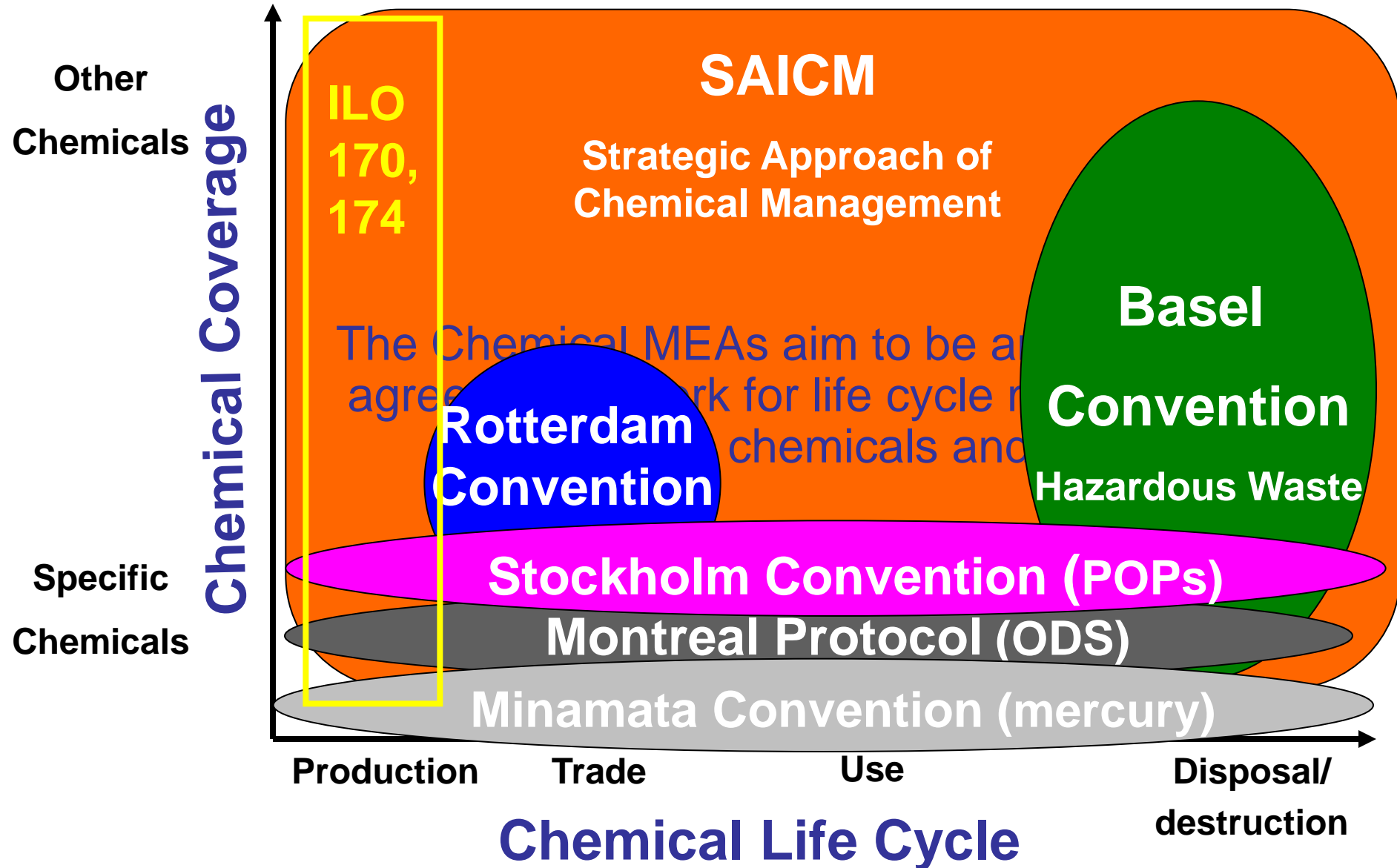
Need to take care that the effort put in the management of these few chemicals do not distract from controlling the bulk of chemicals!!

Strategic Approach to International Chemicals Management (SAICM)

World Summit on Sustainable Development 2002 agreement to:

- At World Summit on Sustainable Development (WSSD) in Johannesburg (2002) **governments recognizing the importance of improved management of all hazardous chemicals**, adopted the goal that chemicals should be “**used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment**” by 2020 (WSSD 2002, 23)
- “Develop a **strategic approach to international chemicals management** to achieve by 2020 that chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health & environment...”
- **UN agreement** for sound management of chemicals in general (02/2006) (www.saicm.org) and possible starting point for an overall international chemicals management policy.

Scope of Global Chemical MEAs



More Information

Basel Convention: www.basel.int

Rotterdam Convention: www.pic.int

Stockholm Convention: <http://chm.pops.int/>

Montreal Protocol/Vienna Convention: <http://ozone.unep.org>

SAICM: <http://www.saicm.org/>

Barcelona Convention http://www.unep.ch/regionalseas/regions/med/t_barcel.htm

POPs phase out & alternatives <http://poppub.bcrc.cn/>

OECD: <http://www.oecd.org/chemicalsafety/>

Science: www.ipcp.ch; <http://greensciencepolicy.org/>

NGOs: www.ban.org; www.ipen.org; www.ihpa.info



Basel Convention

Rotterdam Convention

Stockholm Convention

Synergies

<http://synergies.pops.int/>

SYNERGIES

among the Basel, Rotterdam
and Stockholm conventions





THANK YOU

Dr. Roland Weber
POPs Environmental Consulting
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Stockholm Convention POPs free initiative

- A 'POPs-free initiative' has been initiated by the Secretariat of the Stockholm Convention to improve the exchange of information on alternatives/substitutes to POPs.
- As a follow up of the 'POPs-free initiative' an electronic publication is currently developed compiling information on alternatives to POPs and phase out opportunities and to further improve the exchange of information on alternatives and substitutes to POPs from different stakeholders.

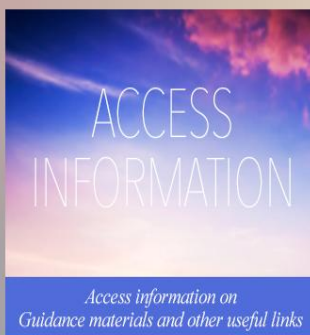
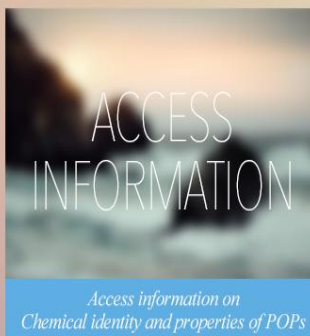
<http://poppub.bcrc.cn/>



PUBLICATION

POPs in Articles and Phasing-Out Opportunities

Search the Publication



Preface, Acknowledgements, Abbreviations and Acronyms

[More>](#)

The electronic publication on POPs in Articles and Phasing-Out Opportunities aims at assisting Parties and others in their implementation by providing a compilation of information on alternatives to POPs in current uses.

To support Parties in meeting these obligations, a methodology has been developed to ensure that source inventories and release estimates are complete, transparent, as well as consistent in format and content. It allows Parties to compare results, identify priorities, mark progress and follow changes over time at the national, regional and global levels.

Part I Introduction

The Stockholm Convention on Persistent Organic Pollutants (POPs) was adopted in 2001 and entered into force in 2004. It is a global environmental treaty that aims to protect human health and the environment from a group of chemicals which persist in the environment for long periods; become widely distributed geogra ...[More>](#)

Part II Snapshots of information on each chemical in articles and products

The Stockholm Convention on Persistent Organic Pollutants (POPs) was adopted in 2001 and entered into force in 2004. It is a global environmental treaty that aims to protect human health and the environment from a group of chemicals which persist in the environment for ...[More>](#)

Part III POPs-free/POPs alternatives – overview and case studies

The Stockholm Convention on Persistent Organic Pollutants (POPs) was adopted in 2001 and entered into force in 2004. It is a global environmental treaty that aims to protect human health and the environment from a group of chemicals which persist in the environment for ...[More>](#)

Part IV How can we add more understanding on the use of POPs and alternatives in products and articles?

The Stockholm Convention on Persistent Organic Pollutants (POPs) was adopted in 2001 and entered into force in 2004. It is a global environmental treaty that aims to protect human health and the environment from a group of ...[More>](#)

Part V Conclusions and recommendations

The Stockholm Convention on Persistent Organic Pollutants (POPs) was adopted in 2001 and entered into force in 2004. It is a global environmental treaty that aims to protect human health and the environment from a group of chemicals which persist in the environment for ...[More>](#)

Part VI Annexes

The Stockholm Convention on Persistent Organic Pollutants (POPs) was adopted in 2001 and entered into force in 2004. It is a global environmental treaty that aims to protect human health and the environment from a group of ...[More>](#)

[How to use the electronic Publication](#)

Principles for Adequate Chemical Management⁵⁶

A. Foundational Concepts: Sustainability

1. Integrated Chemicals Management
2. Inter-Generational Equity

B. Avoiding Harm and Managing Risk

1. Precaution
2. Proportionality
3. Life Cycle Approach
4. Prevention;
5. Substitution (Alternatives)
6. Internalization of Costs (Polluter Pays; Ext. Producer Resp.)

C. Transparency, Participation, and Governance

1. Public Participation
2. Right to Know
3. Confidential Business Information
4. Good Governance

D. Cooperation and Accountability

1. Cooperation among States, Common but Differentiated Responsibilities
2. Partnerships
3. Liability

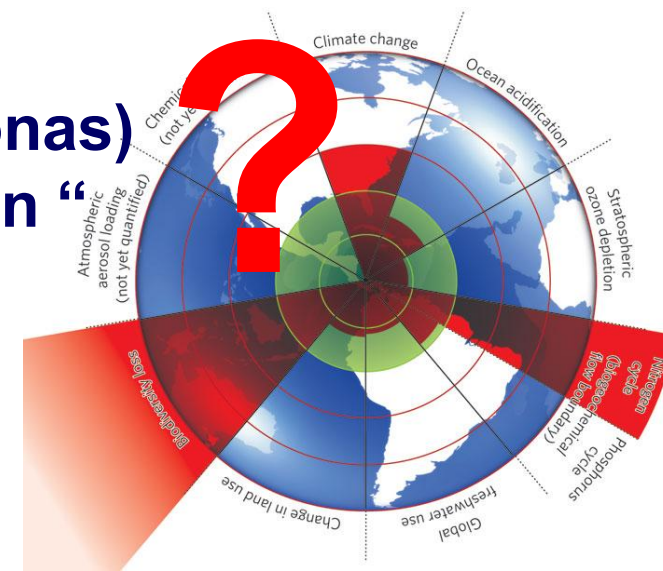
Synergy Process Chemical Conventions

- Many instruments have developed separately without much coordination. This has complicated work at international/national levels
- Only recently, attempts to streamline have resulted in more concrete and integrated actions (i.e., enhancing synergies between the Basel, Rotterdam, and Stockholm Conventions).
- *“Parties to the Basel, Rotterdam, and Stockholm Conventions have approved measures to enhance cooperation and collaboration among the three instruments (common COP 2010, 2013; united secretariats 2012). This process represents one of the few concrete attempts to put into action a long overdue change in the way the intergovernmental institutions address environmental issues”* (Wexler et al. 2012 Chemicals, Environment, Health: A Global Management Perspective. CRC Press).

The Epoch of the Anthropocene

- Also the global chemical pollution demonstrates the crucial impact of humanity on the earth system – and the deterioration of the basis of livelihood of humanity and ecosystems.
- Other globale impacts: climate change, cycles of elements such as phosphorous and nitrogen, degradation of soil and forest.
- Rapid degradation of the ecosystem services in last 50 years !
- This requires adequate responsibility of all stakeholders (governments, industry/producers, science community, civil society, individuals/consumers).

⇒ „The prinziple responsibility“ (Hans Jonas)
 „Ethics for the technological civilization “

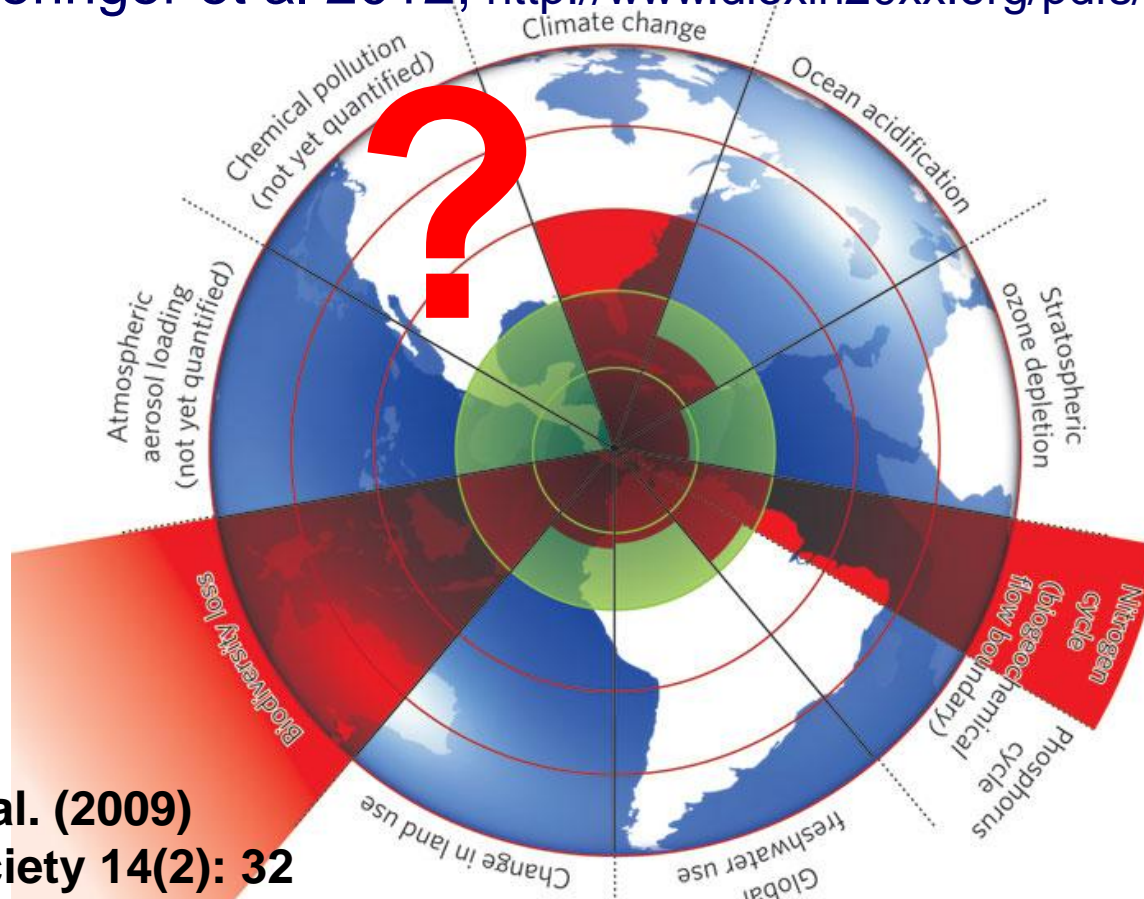


<http://en.wikipedia.org/wiki/Anthropocene>

<http://www.anthropocene.info/>

Planetary Boundaries – Status Chemicals?

- The global boundaries have been evaluated for a range of critical anthropogenic pressure on the Earth System (Rockström et al. 2009).
<http://www.ecologyandsociety.org/vol14/iss2/art32/>
- The international panel on chemical pollution had a first conference paper (Scheringer et al 2012; <http://www.dioxin20xx.org/pdfs/2012/1303.pdf>)



Rockström et al. (2009)
Ecology & Society 14(2): 32

Update post 2015: <http://www.post2015hlp.org/wp-content/uploads/2013/06/Rockstroem-Sachs-Oehman-Schmidt-Traub-Sustainable-Development-and-Planetary-Boundaries.pdf>

The Age/Epoch(?) of the Anthropocene

- Also the global chemical pollution demonstrates the crucial impact of humanity on the earth system – and the deterioration of the basis of livelihood of humanity and ecosystems.
- Other globale impacts: climate change, Cycles of elements such as phosphorous and nitrogen, degradation of soil and forest.
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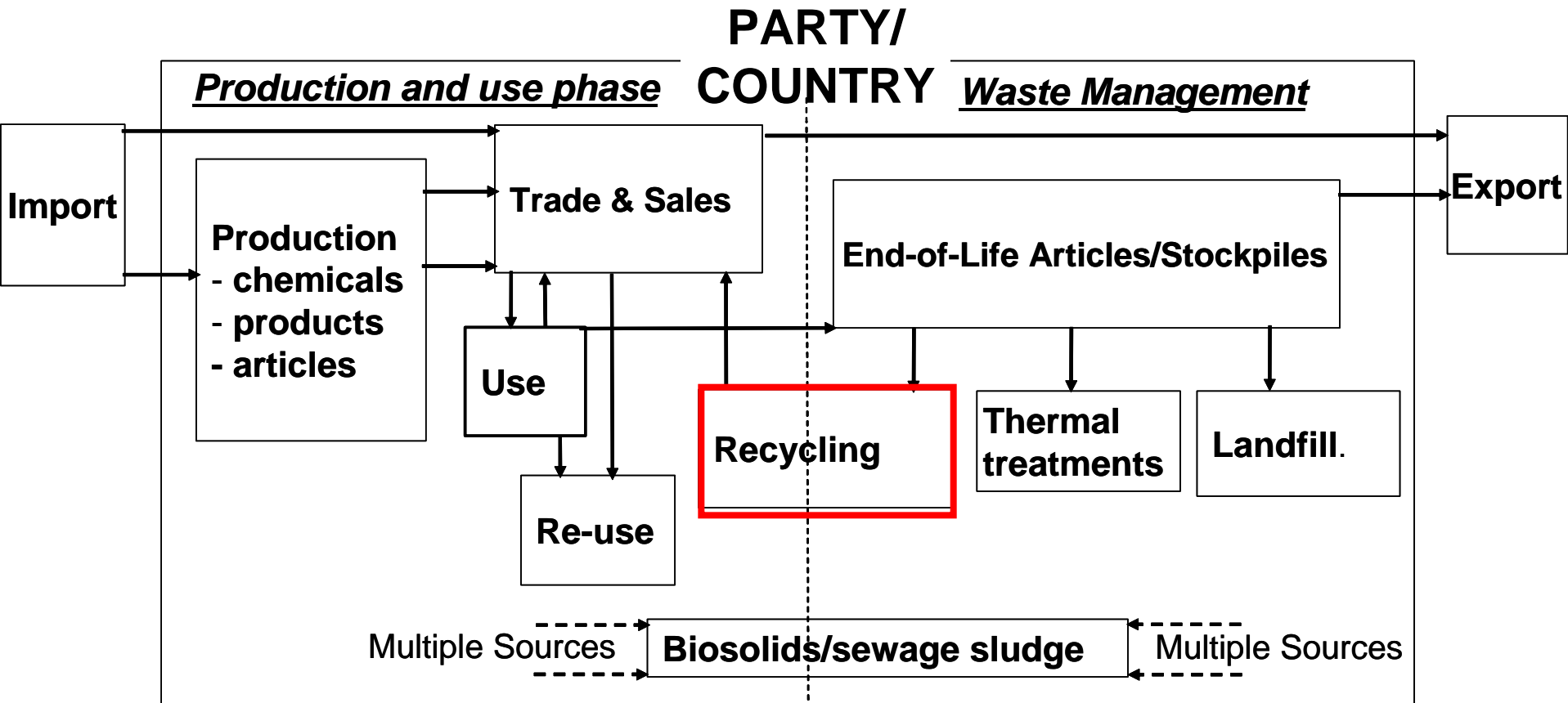
- The dogma of growth (GDP) leads us into the wrong direction – towards an abyss !
 ⇒ Need of other indicators to measure progress !!



- However interest groups, which are against stronger internat. chemical instruments. More strict instruments are however needed to guarantee a healthy future on a cleaner planet.

New listed POPs in the life cycle stages – Management material flows in end-of-life

- Recycling flows (WEEE; EoL Vehicles) are impacted by POPs & ODS.
- Global management of WEEE/ELV offer a chance to demonstrate that synergy between Stockholm, Rotterdam & Basel Convention might work.



Limitations/Challenges of Conventions

- Soft approach (e.g. limited liability; countries can step back) and consensus principle (a few countries can block).
- Only limited support of Conventions from industry.
- Sustainable financing - limited funding compared to the tasks
- Rather small chemical coverage with many “dead chemicals“.
- SAICEM with broad approach but even weaker position - Implementation of 2020 goal lack considerable behind.
- Challenge to address the burden of the past.
- Integration between different international instruments still weak. Cooperation between different IGOs needed (“one UN”). Also cooperation within a country needed. Need of an integrated approach.

Objective of the publication

- To add understanding on POPs in articles & products.
- To help parties to get a simple overview on POPs free/POPs alternatives linking to the available materials developed by POP reviewing committee, activities of parties, regional centers, industry, NGOs and the research community.
- To update on alternatives where POPRC is not updating information (e.g. on alternatives POP-PBDEs).
- To allow an easy update on POPs free/POPs alternatives information.

Only an electronic version of the publication will be developed containing links to the reports and resource materials with the option of an easy update when substantial new information e.g. by POPRC is developed.

OSPAR Convention

„The Convention for the Protection of the Marine Environment of the North-East Atlantic “

(open since 1992, adopted 1998, <http://www.ospar.org>)

Reason: Contamination of the sea by dumping of chemical waste and impact from tributary rivers (Oslo-Convention 1974, Paris-Convention 1978).

Objective: Reduction of the contamination of the sea from waste dumping and from toxic inflow from land; Evaluation and monitoring of the marine environmental quality.

List of ca. 400 substances which are continuously updated (selection criteria are i.a PBT-properties).

Good and important practical example for methods of substance evaluation.

E-waste Inspection and Enforcement Manual

This manual aims to offer practical guidance and background information to regulatory and enforcement officers that deal with the transboundary movements of used EEE and electrical and electronic waste (e-waste). While actions of both export and import countries are important to effectively enforce the Basel Convention, including in relation to e-waste, the manual primarily focuses on countries of import.

The E-waste Inspection and Enforcement Manual combines:

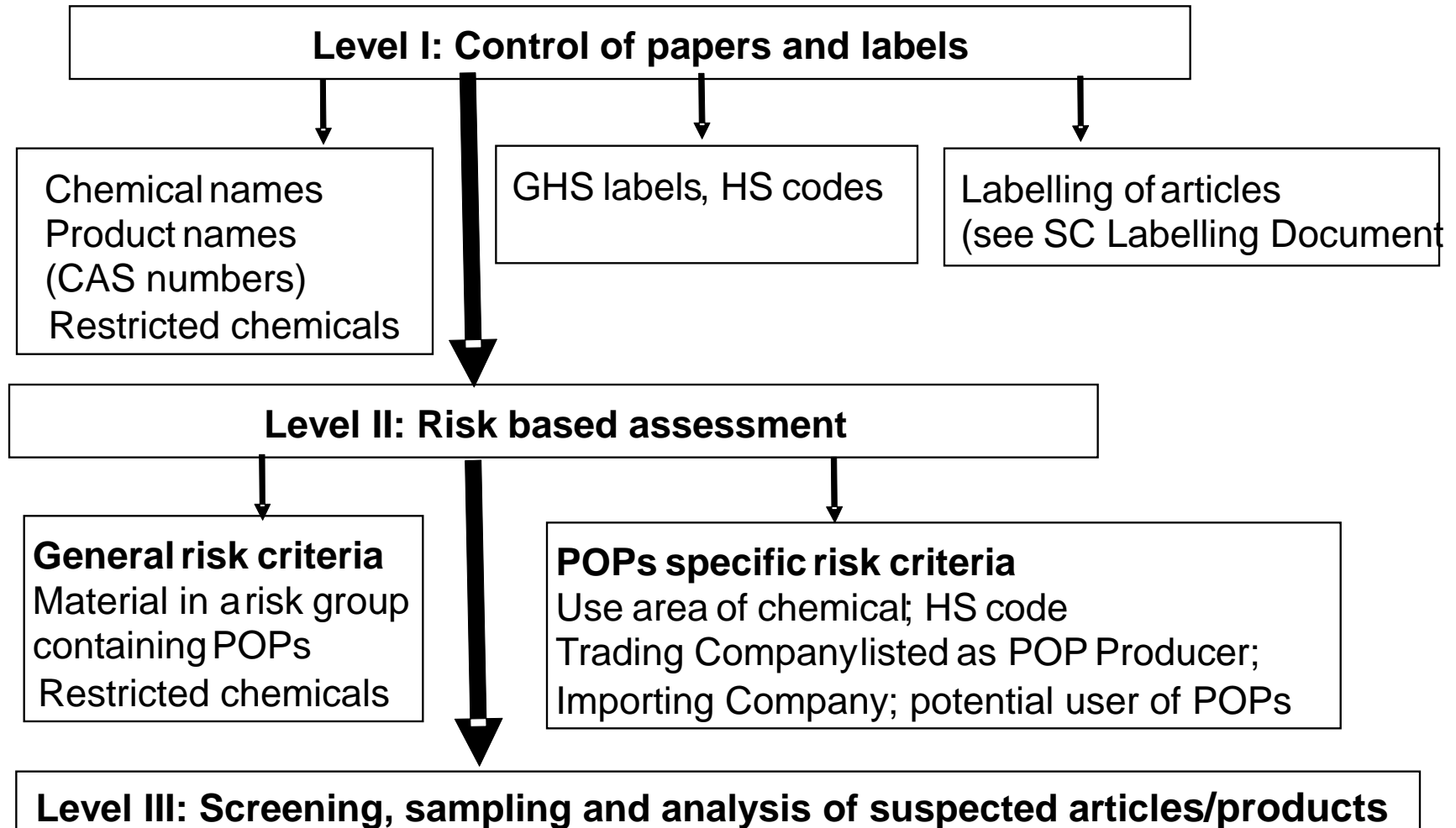
- theoretical information; technical information
- legislative information; procedural information
- international field experience
- instructions and suggestions for inspection procedures
- instructions and suggestions for intervention in the case of detected illegal shipments

<http://synergies.pops.int/Default.aspx?tabid=3534>



Monitoring tools & assessment levels of customs and other competent authorities

Monitoring tools & assessment levels of competent authorities (custom, factory inspection, market surveillance) for chemicals, articles and products.



Experience of Turkey on controlling PFOS and PBDEs at custom level

- The specific Harmonized Commodity Description and Coding System **(HS) codes** do not cover PFOS and related substances yet and were **not useful to detect PFOS containing chemicals or products**. Under Rotterdam specific HS codes for PFOS and PBDEs might be developed in future.
- Chemical Abstracts Service (CAS) numbers of PFOS-related substances are known (listed in SC custom guidance). However **customs does not work with CAS numbers**.
- The **reporting limit of GHS (0.1%) is too high for controlling PFOS** (and other PFAS) often used at lower levels in mixtures.
- PFOS and PBDE in articles and products are not labelled. Generally currently **difficult/not possible to discover chemicals in products**.
- **Please Note: SC required labelling for HBCD for new products. However former products/articles are not labelled.**

Control of import of (hazardous) waste - necessity to have the right frame and limits

- Catagena Declaration on the Prevention, Minimization and Recovery of Hazardous Wastes and Other Wastes.
- Basel Convention: Hazardous waste can be imported to industrial countries. Future option: hazardous waste might be imported for recycling to developing countries?.

Case study 1:

- Hazardous sludges containing PFOS and PFOA were imported from Netherlands to Germany (2003.2006) in compliance with waste legislation. The company importing the sludge mixed it with soil and sold it to farmers as soil improver.
- Hundreds of agricultural fields and the drinking water of 5 million people were impacted with PFOA/PFOS. Remediation is ongoing (Kroefges et al. 2007 <http://www.dioxin20xx.org/pdfs/2007/07-634.pdf>)
- German legislation for sludge and bio-solids did not cover PFOS. Now PFOS is included in sewage sludge regulation.

Control of Dioxins and other unintentional POPs at custom level?

Case study 2: Import of industrial fat (**123 ng TEQ/kg**) from biodiesel production caused **feed and food contamination and blocking of 4700 farms**. (Weber et al. 2011 <http://www.dioxin20xx.org/pdfs/2011/0805.pdf>)

- Stockholm Convention mention Dioxin BAT limit for air emissions but not for e.g. products or food or feed. UPOPs are not included in RC.
- The Basel Convention has a provisional “**low**” POPs content of **15,000 ng TEQ/kg**. Highly polluted waste fat, sludges, ashes can be imported under Basel (**EU limit feed additives 1 ng TEQ/kg** !).

⇒ **The current BRS Conventions do not protect from the import of Dioxin/UPOPs contaminated chemicals, products, materials!**

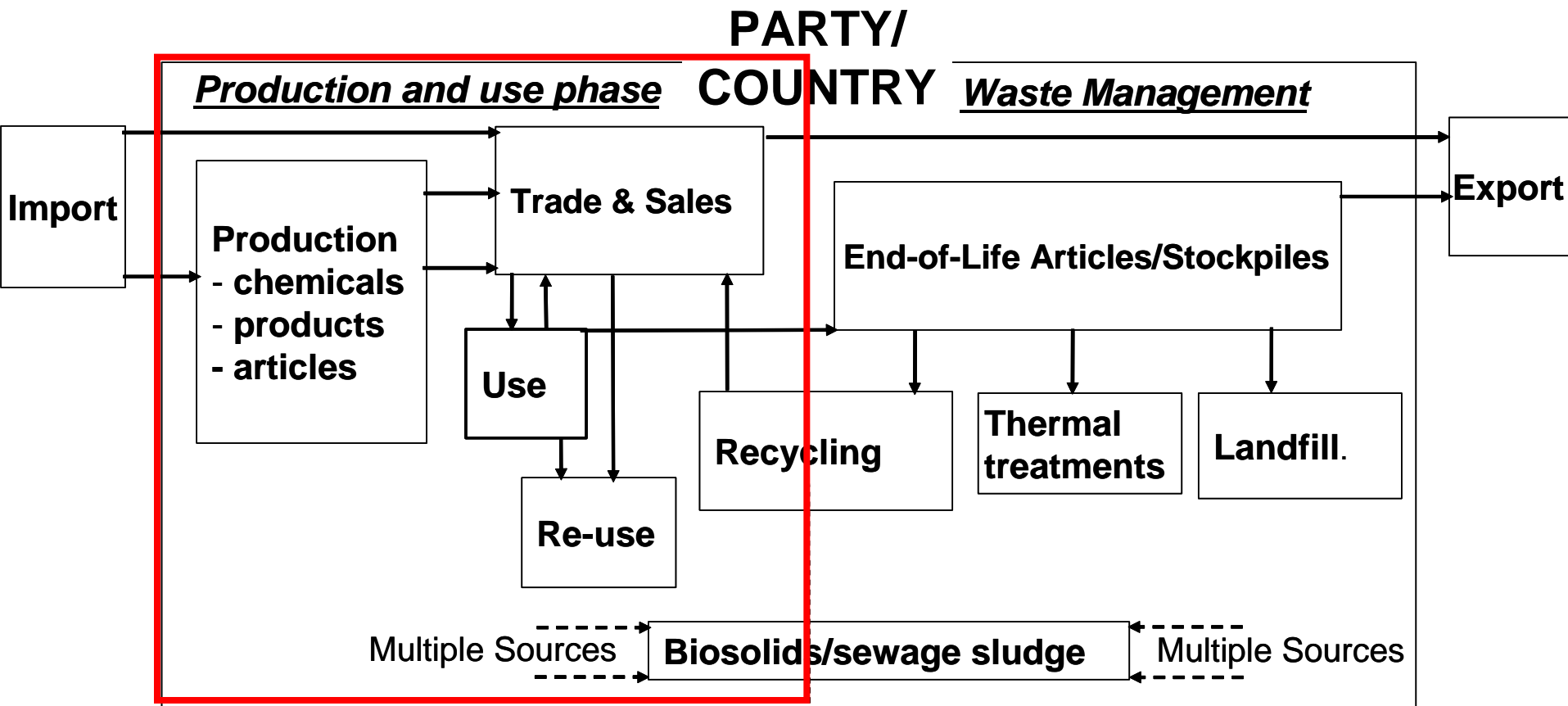
- Only national regulations can protect against import of UPOPs.
 - Japan has set limits for Dioxins in pesticides. But Japan is using the Basel Low POPs limit for PCBs (50 ppm) to protect from import of PCB in product/pigment.

Control of Import of hazardous waste - necessity to have right limits and frame

- The import of waste or recycled materials need to be controlled against harm to human health and the environment.
 - If (hazardous) waste is imported for recycling, a rigorous management and infrastructure scheme for the control is needed.
- ⇒ Only licensed companies should be allowed to (import and) manage wastes. Hazardous waste need control by government!
- Waste is often traded as good. Challenge to describe between goods and waste. (secondary EEE versus WEEE; hazardous sludge - bio solid).
 - Basel Convention has guidance to describe between EEE and WEEE. However e.g. bio-solids or fat/oil are not appropriately covered by international regulation (would need appropriate limits) but national regulation would apply.

POPs and other toxic chemicals in use – BRS management support and challenges

A range of exposure to chemicals come from the use phase:
Occupational exposure but also exposure of consumers.



Dioxin and PCB Pollution Baltic Sea

- The Baltic Sea is among the marine areas most heavily polluted by dioxins, PCB and related compounds.
- Six decades contamination has resulted in Dioxin/PCB levels in fish above the EU limit for fish consumption

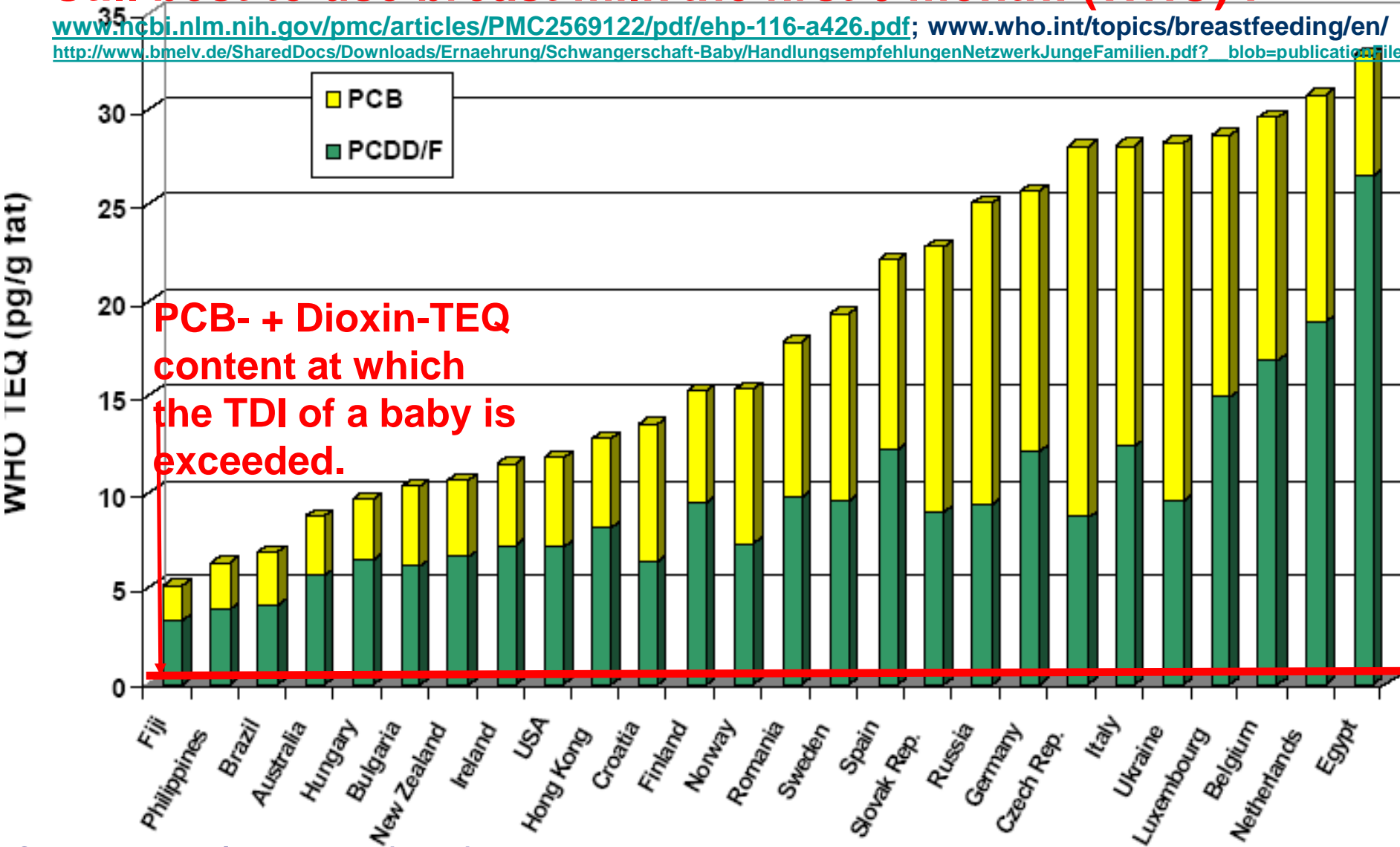


- Sweden and Finland have exemptions to market fish above EU Dioxin limits in their country with respective risk-communication to their population.
- The Baltic Sea is one example of the vulnerability of the open sea towards chemical & waste release
- Also the pollution of the Sea can only be controlled and managed by cooperation of the countries bordering the respective sea.

PCDD/PCDF und PCB (WHO TEQ) in Breast milk (3rd WHO Study)

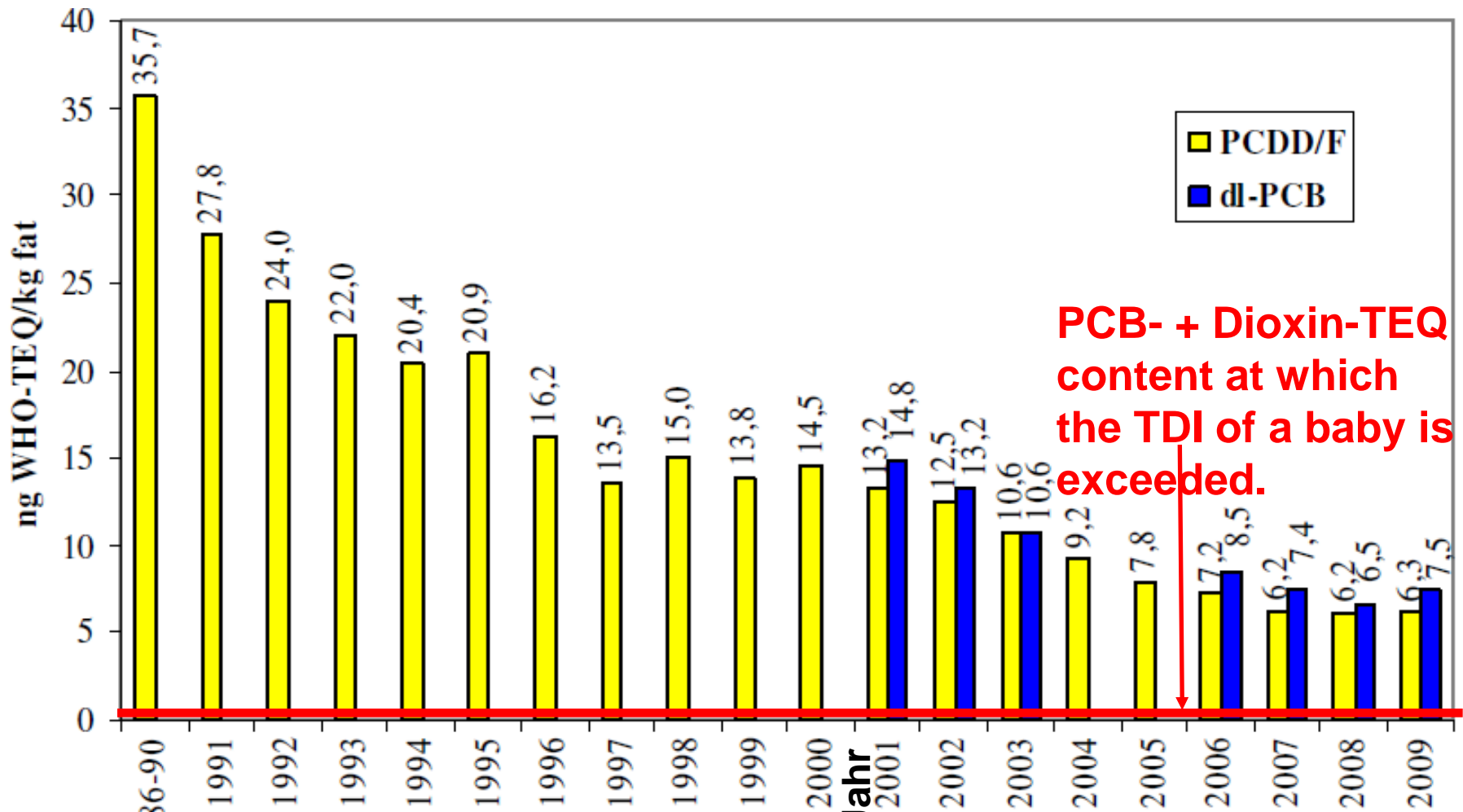
- Still best to use breast milk the first 6 month! (WHO) !

www.ncbi.nlm.nih.gov/pmc/articles/PMC2569122/pdf/ehp-116-a426.pdf; www.who.int/topics/breastfeeding/en/
<http://www.bmelv.de/SharedDocs/Downloads/Ernaehrung/Schwangerschaft-Baby/HandlungsempfehlungenNetzwerkJungeFamilien.pdf?blob=publicationFile>



Dioxin/dl-PCB (TEQ) in German Breast Milk

- Die Dioxin Humanmilch contamination in Germany has significantly reduced the last 20 years by approx. 75%. However it will probably take more than 100 years until babies will be exposed below the TDI (PCB+Dioxin). Still mother milk is the best nutrition for a baby!
www.ncbi.nlm.nih.gov/pmc/articles/PMC2569122/pdf/ehp-116-a426.pdf; <http://www.who.int/topics/breastfeeding/en/>
http://www.bmelv.de/SharedDocs/Downloads/Ernaehrung/Schwangerschaft-Baby/HandlungsempfehlungenNetzwerkJungeFamilien.pdf?__blob=publicationFile



Source: Vieth et al., Organohalogen Compounds Vol. 73, 1559-1562 (2011)



Stockholm Convention - challenges

STOCKHOLM
CONVENTION

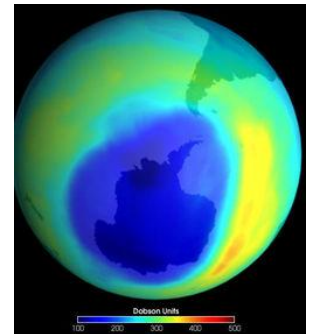
Pesticide stockpile management developing ;

- Summary problems
- Situation Pesticide stockpile Africa
- Situation pesticide stockpile East Europe
- Conclusion – currently not possible to manage pesticide stockpiles



Vienna Convention/Montreal-Protocol

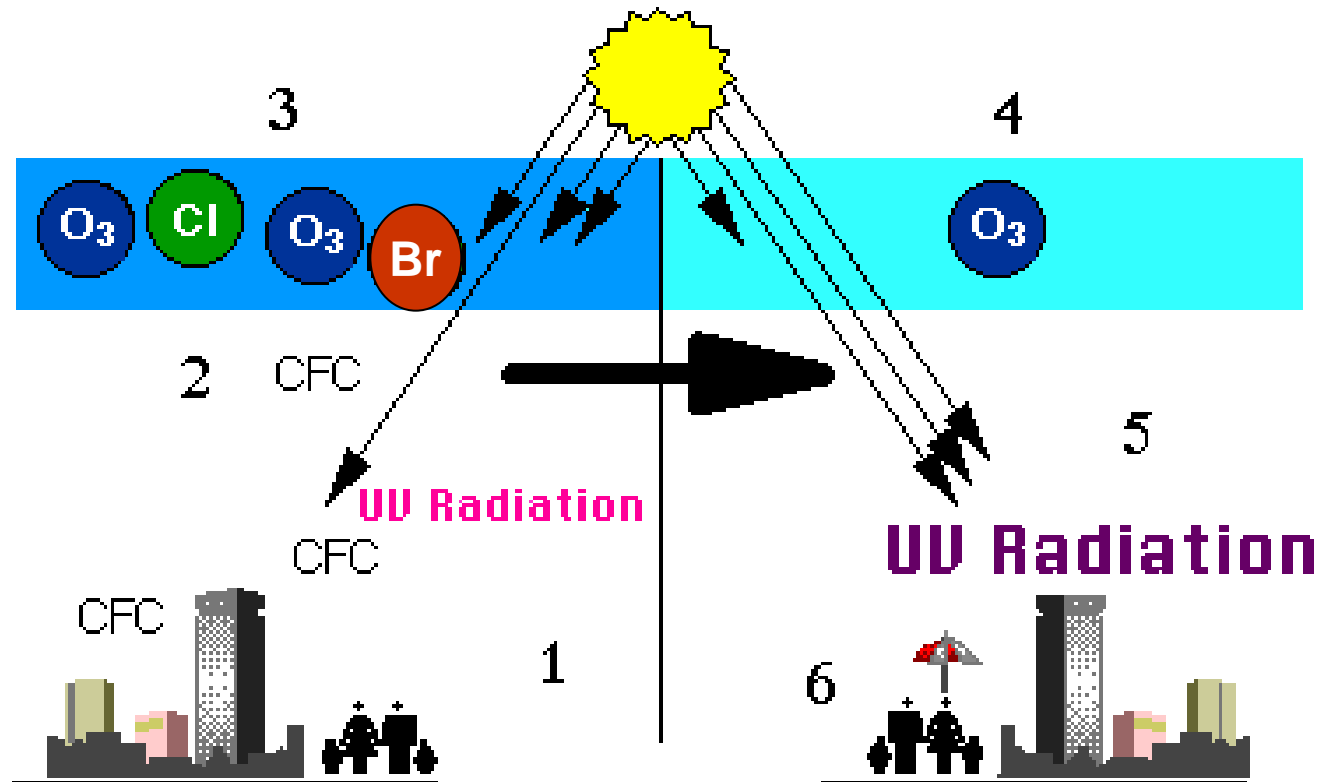
- **Vienna Convention** for the Protection of the Ozone Layer (1985) calls for voluntary measures to reduce emissions of ozone-depleting substances (ODS).
- First global instrument to address global problems caused by chemicals.
- **Montreal Protocol** (1987) on Substances that Deplete the Ozone Layer establishes a schedule to reduce the production and consumption of CFCs and Halons <http://ozone.unep.org/>
- **Reason:** Discovery of “ozone hole” over Antarctic (1985) leading to increased UV-B radiation.
- Increasing levels of UV-B radiation result in:
 - Increased rates of skin cancer and eye cataracts,
 - weakened immune system
 - similarly negative impact on animals
 - damage plants and reduce crop yields



Vienna Convention/Montreal-Protocol

- **Objective:** Protection of the Ozone layer by phasing out the production of Ozone Depleting Substances (ODS).

The destruction of the stratospheric ozone



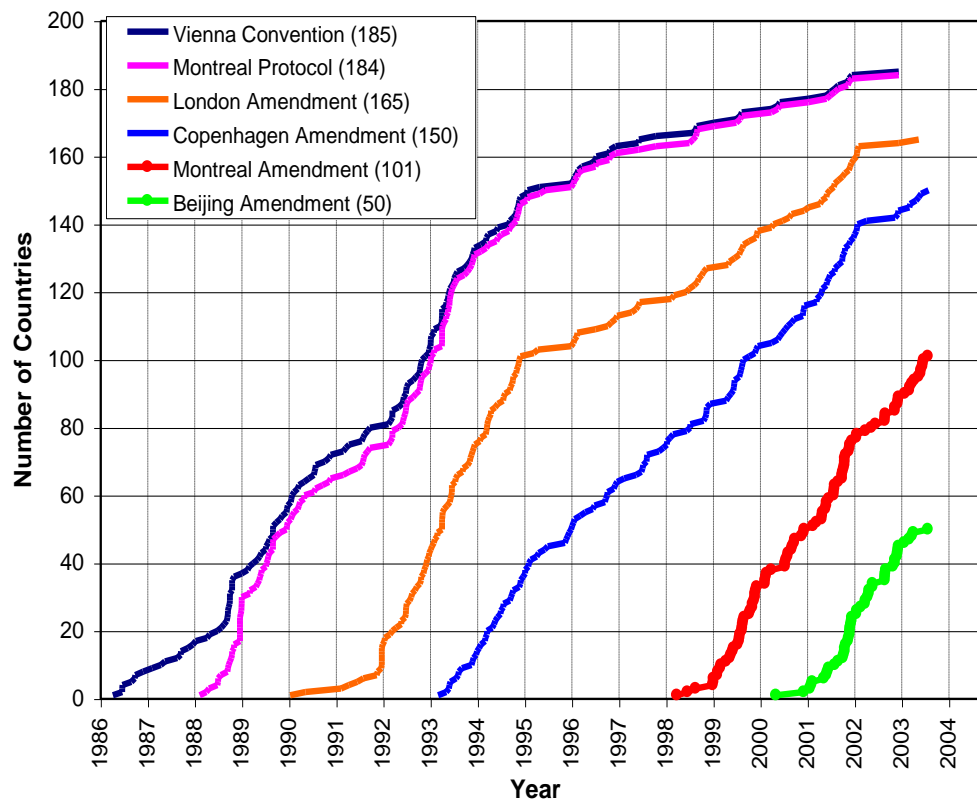
- 1 - CFCs released
- 2 - CFCs rise into ozone layer
- 3 - UV releases Cl from CFCs

- 4 - Cl destroys ozone
- 5 - Depleted ozone → more UV
- 6 - More UV → more skin cancer

Adjustment/Amendments to Montreal-Protocol

At meetings in London, Copenhagen, Vienna, Montreal and Beijing Parties approve adjustments and/or amendments to the Montreal Protocol to stipulate/accelerate the phase-out schedules and add additional ozone-depleting substances to the list.

(Information sent to the Ozone Secretariat by the Depository, UN Office of Legal Affairs, July, 2003)



London amendment (1990):

“Parties agree to phase out CFCs by the 2000, and establish a Multilateral Fund to assist developing countries. (UNEP 2000)

Common Ozone-Depleting Substances

Substance	Uses	Ozone-Depleting Potential*	Global Warming Potential**
Chlorofluorocarbons (CFCs)	Refrigerants, cleaning solvents, aerosol propellants, and blowing agents for plastic foam manufacture.	0.6 – 1.0	4,680 – 10,720
Halons (BCFCs, BFCs)	Fire extinguishers/fire suppression systems, explosion protection.	3 – 10	1,620 – 7,030
Carbon tetrachloride (CCl ₄)	Production of CFCs (feedstock), solvent/diluents, fire extinguishers.	1.1	1,380
Methyl chloroform (CHCl ₃)	Industrial solvent for cleaning, inks, correction fluid.	0.1	144
Methyl bromide (CH ₃ Br)	Fumigant used to control soil-borne pests and diseases in crops prior to planting and in commodities such as stored grains. Fumigants are substances that give off fumes; they are often used as disinfectants or to kill pests.	0.6	5
Hydrochlorofluorocarbons (HCFCs)	Transitional CFC replacements used as refrigerants, solvents, blowing agents for plastic foam manufacture, and fire extinguishers. HCFCs deplete stratospheric ozone, but to a much lesser extent than CFCs; however, they are greenhouse gases.	0.01 – 0.5	76 – 2,270
Hydrofluorocarbons (HFCs)	CFC replacements used as refrigerants, aerosol propellants, solvents, and fire extinguishers. HFCs do not deplete stratospheric ozone, but they are greenhouse gases.	0	122 – 14,130

* Ozone-depleting potential (ODP) is the ratio of the impact on ozone caused by a chemical compared to the impact of a similar mass of CFC-11. The ODP of CFC-11 is 1.0.

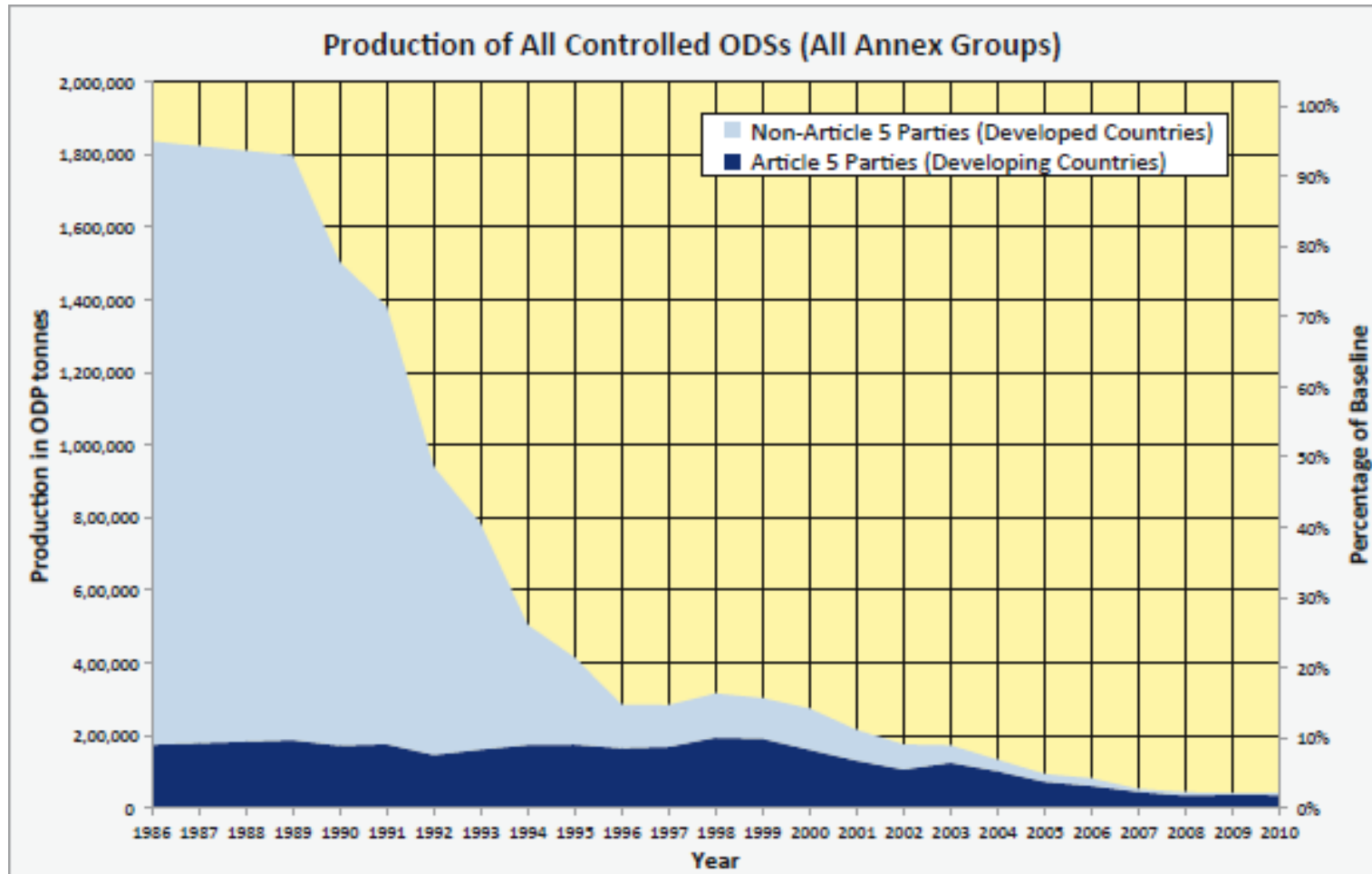
** Global warming potential (GWP) is the ratio of the warming caused by a substance compared to the warming caused by a similar mass of carbon dioxide. The GWP of carbon dioxide is 1.0.

Source: UNEP-MP (2012) Progress Report 1987-2012

Vienna Convention/Montreal-Protocol

Achievements

- Whereas in 1987 production of controlled ODS exceeded 1.8 million t/year, it had been reduced to approx. 45,000 tonnes 2010.



Vienna Convention/Montreal-Protocol

Achievements

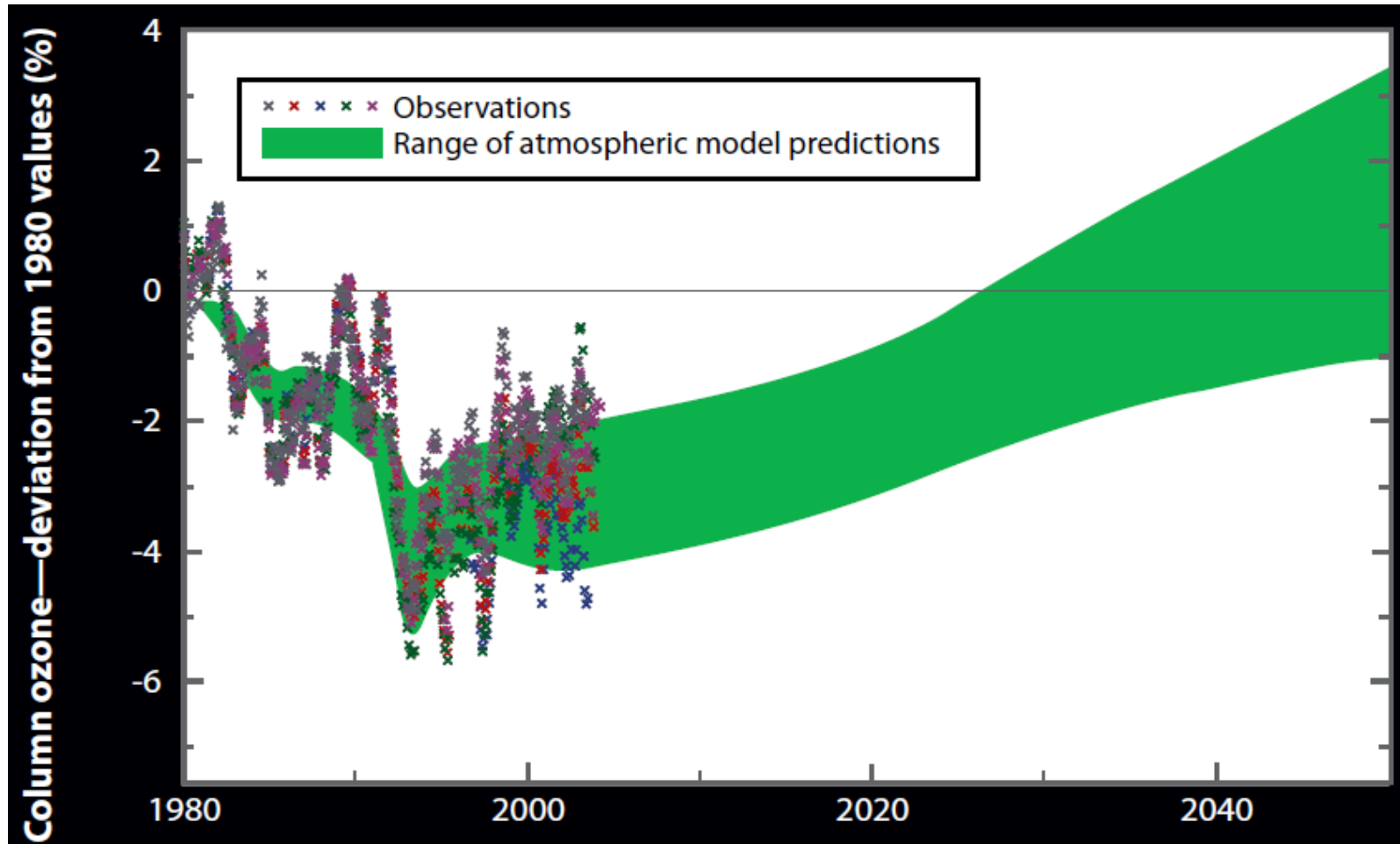
Estimation if there would have been no Convention/Protocol:

- The ozone depletion by the year 2050 would have been at least 50% in the mid latitudes in the northern half of the earth, 70% in the mid latitudes of the south, about 10 times larger than today. The UV-B radiation would have doubled in the north and quadrupled in the south in the same places. The ozone depleting chemicals in the atmosphere would have been 5 times higher.
- The implications of this increase would have been horrendous - 19 million more cases of non-melanoma cancer, 1.5 million cases of melanoma cancer, 130 million more cases of eye cataracts.

Vienna Convention/Montreal-Protocol

Achievement?:

Predicted recovery of the ozone layer by 2050 to 2065

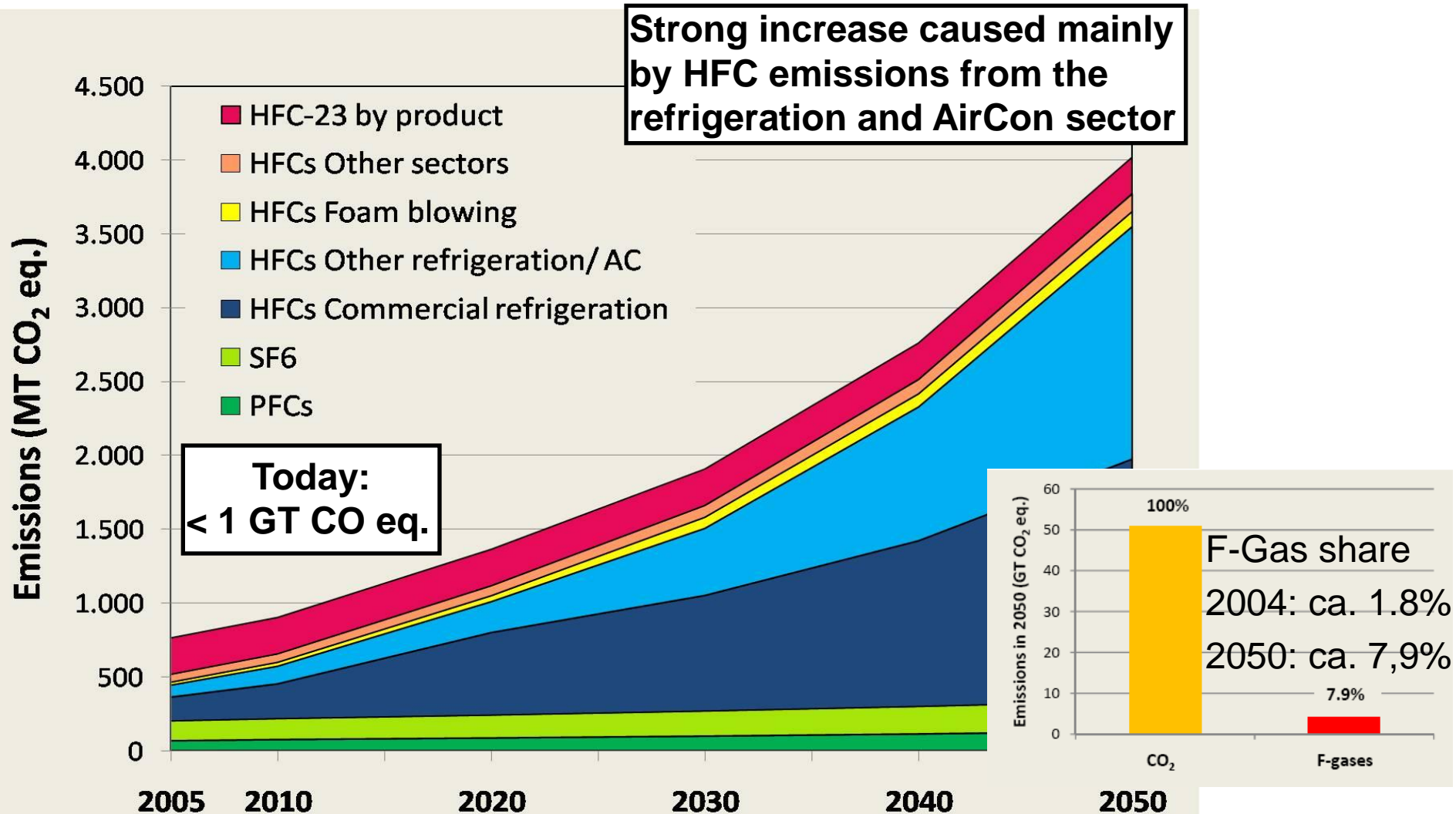


Source: Intergovernmental Panel on Climate Change/Technology and Economic Assessment Panel. Special Report on Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluoro-carbons. (Cambridge: Cambridge University Press, 2005.) Figure SPM-3.

Vienna Convention/Montreal-Protocol

- **Shortcomings;**
 - **ODS Banks:** Many millions of tons of CFCs remain in old or discarded refrigerators, air-conditioners, insulating foam, and dozens of other products and wastes, collectively known as “**ODS Banks**” (“**GHG Bank**”) A hundred thousand tons of ODSs enter the waste stream every year.
 - Problem 1) collecting ODS around the globe.
 - Problem 2) destruction of ODS in developing countries.
 - The “Alternatives” HCFCs and HFCs are **potent climate gases** (up to 10,000 times more potent GHG than CO₂). Some countries have switched with investments from CFCs to HFCs.
- Further reading
 - Montreal Protocol Handbook (2012):
http://ozone.unep.org/Publications/MP_Handbook/MP-Handbook-2012.pdf
 - Down to Earth (2013). The Gas Game
<http://www.downtoearth.org.in/content/gas-game>
 - UNEP, WMO (2014) Assessment for Decision Makers: Scientific Assessment of Ozone Depletion: 2014 WMO, Global Ozone Research and Monitoring Project— Report No. 56, Geneva, Switzerland, 2014.
http://ozone.unep.org/Assessment_Panels/SAP/SAP2014_Assessment_for_Decision-Makers.pdf#sthash.RXGoopVh.dpuf

Trend of F-gas CO₂eq. emissions until 2050⁸⁶ (business-as-usual scenario)



Source: B. Gschrey, W. Schwarz, Projections of global emissions of fluorinated greenhouse gases in 2050. Study for German Environmental Agency (UBA) 11/2009.

http://www.oekobaernde.de/english/berichte/volltext/F_Gases_2050.pdf

SAICM - Background

World Summit on Sustainable Development 2002 agreement to:

- ...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 & Development...
- ...and support developing countries in strengthening their capacity for the sound management of chemicals and hazardous wastes by providing technical and financial assistance.

SAICM - Scope

SAICM has a scope that includes

- Environmental, economic, social, health and labour aspects of **chemical safety** (Achieve sound management of chemicals by 2020)
- Agricultural and industrial chemicals, with a view to promoting sustainable development and covering chemicals at all stages of their life-cycle, including in products.

SAICM - Objectives

- **Risk reduction**
- **Knowledge and information generation**
- **Governance**
- **Capacity-building and technical cooperation**
- **Illegal international traffic**

SAICM - Emerging Policy Issues

Emerging policy issues under consideration are

- Lead in paint;
- Chemicals in products;
- Hazardous substances in electrical and electronic products;
- Nanotechnology and manufactured nanomaterials.

Other emerging policy issues suggested:

- Managing perfluorinated chemicals and the transition to safer alternatives
- Endocrine disrupting chemicals
- Persistent pharmaceuticals

SAICM: Principles & Approaches

- Using existing declarations, policy documents and agreements rather than establishing own individual principles.

These include:

- the Rio Declaration,
- Agenda 21,
- the Johannesburg Plan of Implementation, and
- the Basel, Rotterdam and Stockholm Conventions.

⇒ Overarching Policy Strategy

SAICM - What does it consist of?

- Dubai Declaration on International Chemicals Management (political commitment 02/2006)
 - Overarching Policy Strategy (scope, needs, objectives, principles, financial and implementation arrangements)
 - Global Plan of Action (work areas, activities, actors, timeframes and targets, indicators of progress)
- Further reading : <http://www.saicm.org/>

Weaknesses/Challenges of SAICM

- No binding character
- Very limited resources
 - Most SAICM applications from countries were rejected in recent years due to a lack of resources.
 - Even resource for SAICM secretariat staff seems missing