Training Workshop on the Updating of National Implementation Plans (NIPs) for Persistent Organic Pollutants (POPs)

4-6 April 2016
Suva, Fiji

Yes or No?

Have those items something in common?

THIS PRESENTATION

- Introduction
- PBDEs inventories
- PFOS inventories

Introduction

POPs listed in 2009, 2011 and 2013

Chemical	Pesticides	Industrial chemicals	Unintentional production	Annex
Chlordecone	+			A
Lindane	+			A
Alpha hexachlorocyclohexane	+		By-product of lindane	A
Beta hexachlorocyclohexane	+		By-product of lindane	A
Endosulfan	+			A
Hexabromodiphenyl ether and heptabromodiphenyl ether		+		A
Tetrabromodiphenyl ether and pentabromodiphenyl ether		+		A
Hexabromobiphenyl		+		A
Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	+	+		B
Hexabromocyclododecane		+		A
Pentachlorobenzene	+		+	A, C

Why to develop an inventory ?

- POP inventories are the basis for **prioritization**, **action plan development** and for deciding on management strategies.
- It allows the assessment **whether the current country situation meets the SC requirements** and where not**.**
- It provide a basis for the **reporting obligations**.
- Helps to **identify information gaps** for prioritization and action plan development.
- To identify the need for **further financial/technical support**.

The essential elements of the report:

- **Objectives and scope**

- Description of **data methodology** used and how data were gathered

- **Final results** of the inventory in each sector considered a priority for that country (using a format to be provided in the guidelines, as such or adapted from that format)

- Results of the **gap-analysis and limitations** identified for completion of the inventory

- **Further actions** (e.g. stakeholder involvement, data collection strategies) to be taken to complete the inventory and recommendations.

Other information (e.g. stakeholder list), depending on the national requirements, could be included in the report.

GUIDANCE FOR NIP DEVELOPMENT AND UPDATE

REVISED

GENERAL GUIDANCE

Revised

- Guidance for **developing** a NIP (2014)
- Guidance for **action plan costing** (2012)

Not revised

- Guidance for socio-economic assessments (2007)

RECENTLY DEVELOPED DRAFTS

Inventories

- Guidance for the **inventory of PFOS and related chemicals** (2015)
- Guidance for **the inventory PBDEs** listed under the Stockholm Convention (2015)
- Guidance for **the inventory and substitution of HBCD** (2015)

BAT & BEP

- Guidance for **BAT & BEP** for use of **PFOS** and related chemicals (2012)
- Guidance for BAT & BEP for **recycling & waste disposal of articles** containing **PBDEs** (2012)

OTHER

- ✓ Guidance for the **control of the import and export** of POPs (2012)
- ✓ **Labeling** of products or articles that contain POPs - initial considerations (2012)

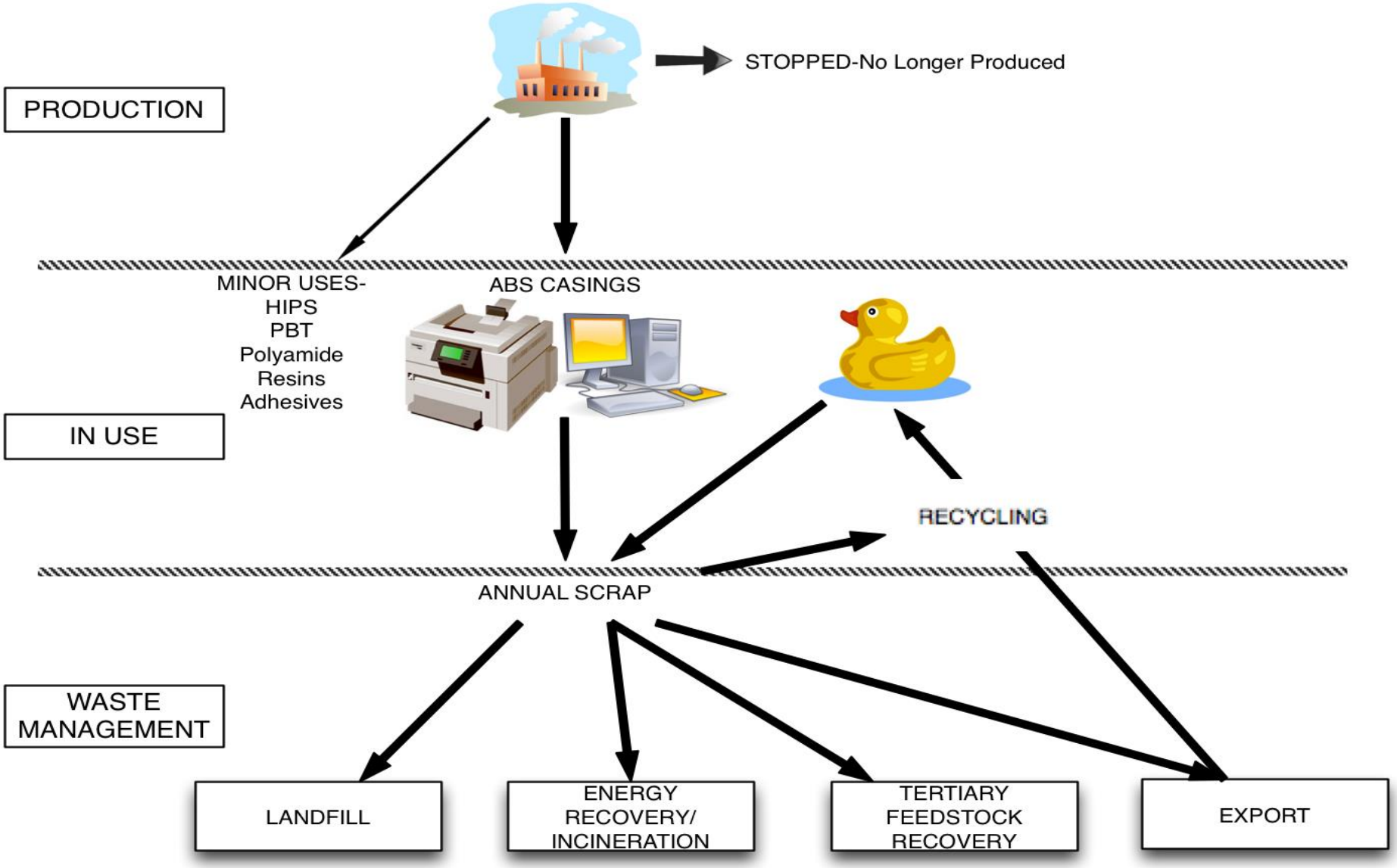
PBDES inventories

PBDEs (C-penta and C-octa)

- **Production and use: not allowed**.
- Use of articles already in use: allowed
- **Recycling of articles containing POP-PBDEs:** ALLOWED UNTIL 2030

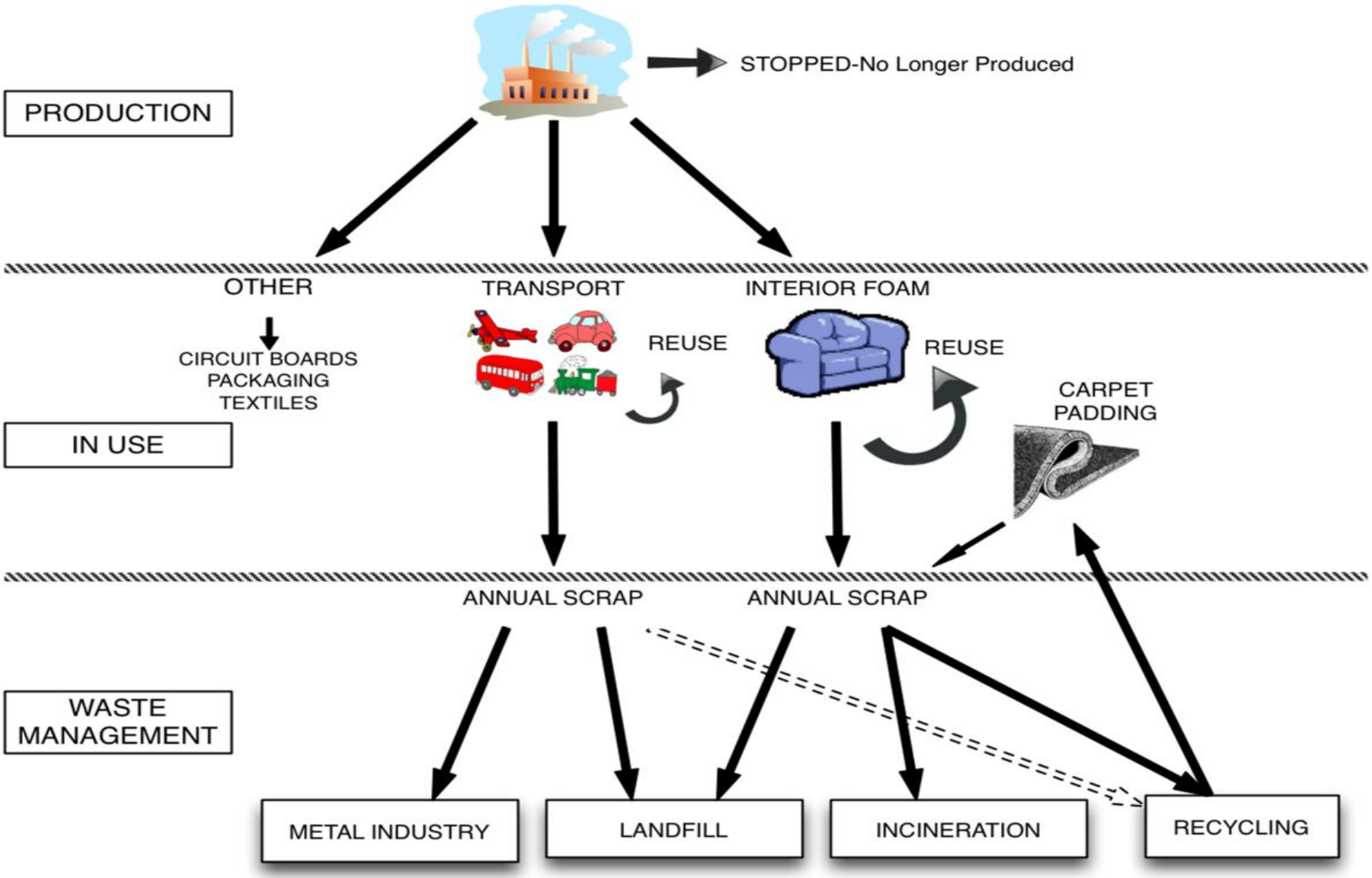
Life cycle of c-OctaBDE

(adapted from Alcock et al.2003)

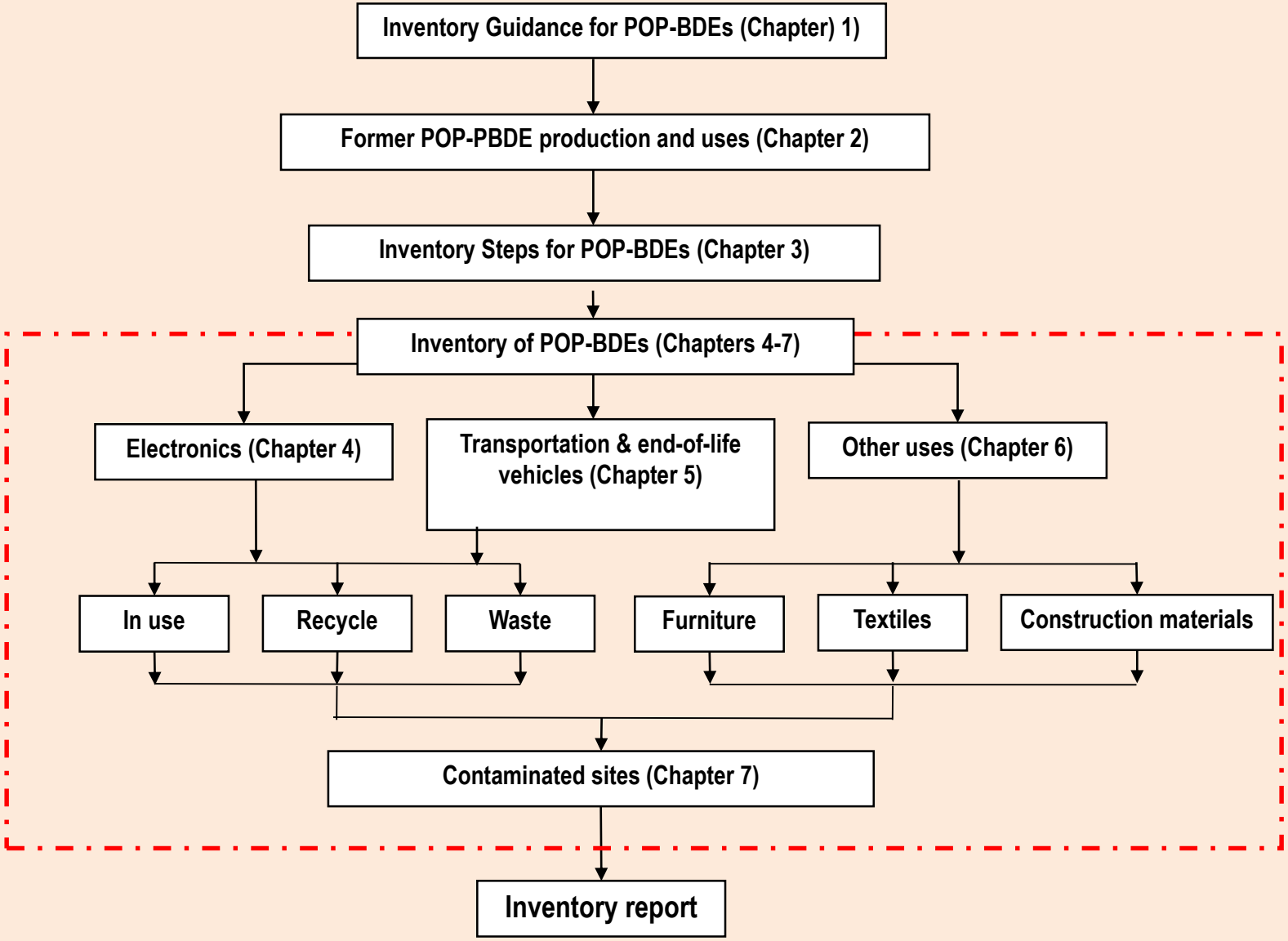


Life cycle of c-PentaBDE

(adapted from Alcock et al.2003)



Structure of the PBDE Guidance



STEPS

Step 1: Planning the inventory

- Establish national inventory team
- Identify key stakeholders
- Define inventory scope
- Develop the work plan

Step 2: Choosing data collection methodologies

- Tiered approach

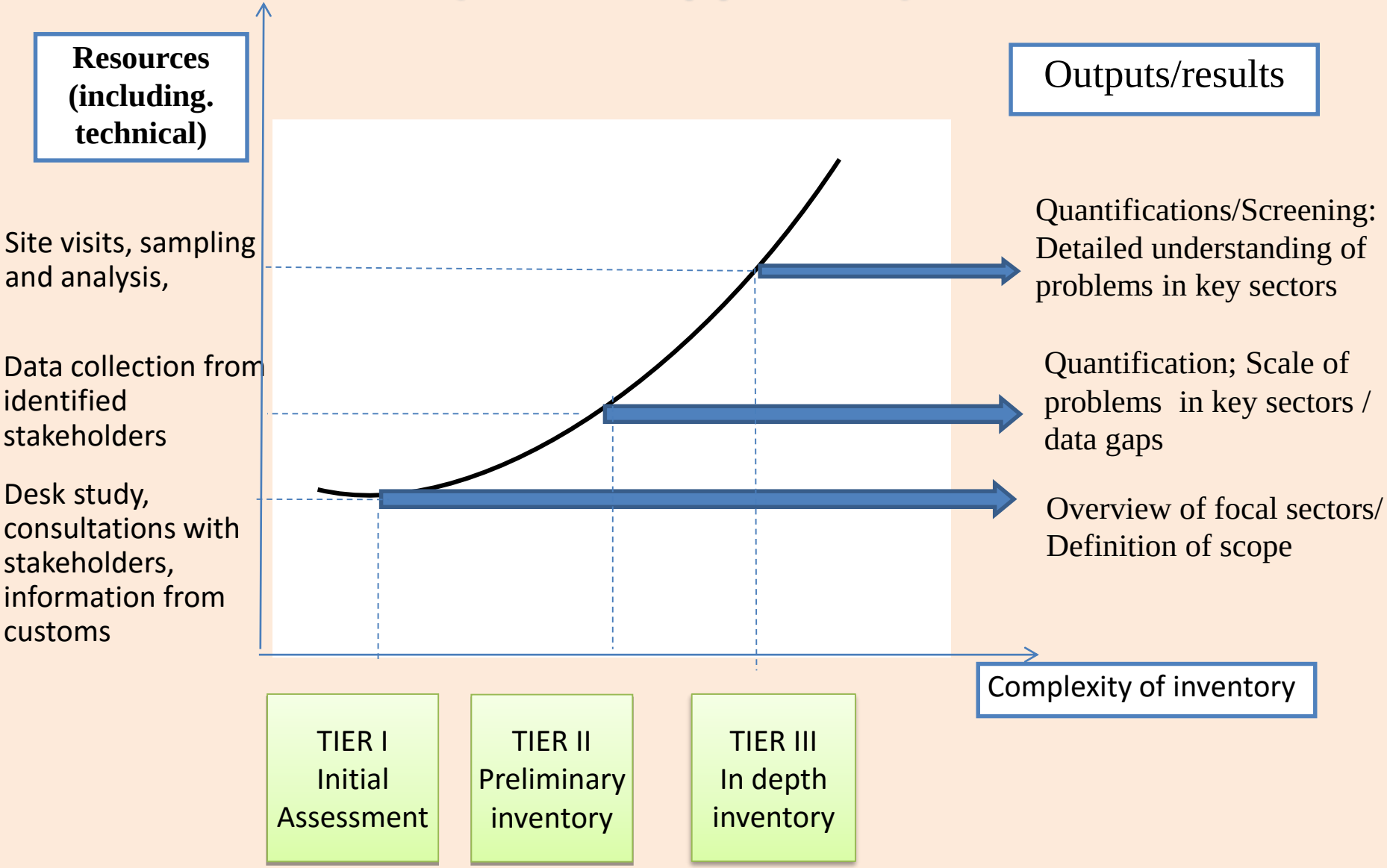
Step 3: Collecting and compiling data from key sectors

- EEE in use, stocks, in recycling and waste
- Transport sector and end-of-life vehicles
- Other uses (e.g. furniture, mattresses, textiles)
- Contaminated sites

Step 4: Managing and evaluating the data

Step 5: Preparing the inventory report

Choosing Methodology for data collection (Tiered approach)



Electrical and electronic equipment (EEE) and related waste (WEEE)

- Activities for WEEE management are currently developed under Basel Convention.
- If an inventory of EEE/WEEE was established it would be used for the POP-PBDE inventory.
- Vice versa: if an inventory of EEE/WEEE has not been developed then the development of a POP-PBDE inventory would be the start for developing an EEE/WEEE inventory.

Synergy approach of the Basel and Stockholm Convention.

Inventory EEE and WEEE

The inventory of POP-PBDEs EEE/WEEE should address:

- Imported (second-hand) EEE and WEEE
- EEE stocks (in use and stored)
- EEE entering the waste stream (WEEE).
- Recycling of WEEE polymers (own/imported polymer)

Adopt of a three step approach:

1. Inventory of stocks and flows of EEE/WEEE.
2. Estimate polymer fraction in relevant EEE/WEEE.
3. Estimation of POP-BDEs content in these polymers.

Transport Sector

- Large material flows of goods and waste:
  - Cars, busses, trucks, trains, planes, ships
- End-of-life management:
  - Recovery of materials and of managing pollutants.

- POP-PBDEs in transport:
  - C-PentaBDE: major use in flexible PUR foams (*seating; head rests; car ceilings, back-coating of textiles*).
  - C-OctaBDE: Minor use in plastics parts (*dashboards; door panels, steering wheels; bumpers*).

POP-PBDE in other uses

- Other former uses of POP-BDEs (furniture, mattresses, textiles, in construction, rubber, and drilling operation) are thought to be of minor relevance for most countries due to:
  - Relative low overall use volumes of POP-BDEs in most of these other application (except c-PentaBDE in furniture);
  - Lack of flammability standards in most countries for these use areas (standards for furniture e.g. in US and UK);
  - Limited export of such flame retarded (used) articles from countries with flammability standards.

POP-PBDE in other uses

- **Furniture/mattresses:** Countries with flammability standards or imports from these countries.
- **Textiles:** Limited volume of c-PentaBDE has been used on textiles. Considering that Hexabromocyclododecane (HBCD) is used in textile the sector will become more POPs relevant.
- **Construction:** C-PentaBDE in rigid PUR-foam in some regions. Considering that the main use of HBCDD is in insulation materials (XPS and EPS) the sector will become more POPs relevant.

Annexes to POP-PBDE Inventory Guidance

- ✓ **Questionaire** for EEE importers
- ✓ **Questionaire** for households (EEE)
- ✓ **Questionaire** for corporate and institutional consumers
- ✓ **Questionaire** for recyclers

Case study on inventory of PBDEs in EEE and related WEEE

Case study on PBDE in the Transport Sector

Case study 1

STEP 3 – Collecting and compiling the data
1.Tier 1 inventory approach: Using CRT per capita data

I. INFORMATION PROVIDED IN THE GUIDANCE

(as provided in the inventory guidance document section 4.2.1):

- ✓ the average weight of the CRTs (TV or PC monitors) is 25 kg per device
- ✓ the polymer content 30%;
- ✓ the average c-OctaBDE content
  - For CRT from TV is 0.89 kg/tonne of plastic and
  - For computer is 2.54 kg/tonne of plastic (Table 4-11 of *PBDE Inventory Guidance*).

II. INFORMATION TO BE LOOKED FOR: the penetration rate (number of CRTs/capita)

Case study 1

The c-OctaBDE in CRT is calculated using the following equation:

Estimation using average c-OctaBDE in CRTs
(table *PBDE Inventory Guidance*)

$$M_{c\text{-}OctaBDE(i)} = \text{No of CRTs/capita}_{Region} \times \text{population} \times \text{weight of CRT} \times \text{\% polymer/CRT} \times \text{c-OctaBDE content}$$

Available found:

- Number of CRTs/capita (0.17)

- Population of COUNTRY (154.7 million)

Case study 1

$M_{c\text{-}OctaBDE(i)}$ = No of CRTs/capita$_{Region}$
x population
x weight of CRT
x % polymer/CRT
x c-OctaBDE content

$M_{c\text{-}OctaBDE(i)}$ = No of CRTs/capita$_{Region}$
x population x
0.025 tonnes
x 0.3
x range of OctaBDE/tonne polymer
(0.89 to 2.54 kg/tonne).

With Tier 1:

The total amount of CRTs were estimated to 657,000 tonnes containing 197,000 tonnes CRT polymers.

Case study 2

Corresponding to Table 5-1 of *the POP-PBDE Inventory Guidance)*

Amount of POP-PBDEs in vehicle in current use - year 2010

Registered Vehicles	1975-2004	2005-2010 (those produced before 2005)		Total produced before 2005
Cars	4,637,672	6,530,426	(3,918,256)	8,555,928
Buses	1,918,700	2,705,462	(2,029,097)	3,947,797
Trucks	66,253	93,293	(69,970)	136,223
Total	4,637,672	9,329,181	(6,017,323)	12,639,948

Based on this data vehicles have mainly been imported from Asia (69%), and Europe (12%) and to some extent from North America (7%) and remaining from other regions.

Amount of POP-PBDEs in cars and trucks

Amount of POP-PBDEs$_{\text{Vehicle category}}$ =
Number of vehicles$_{\text{category}}$ (manufactured 1975 to 2004) **x** amount POP-PBDEs$_{\text{category}}$ **x** F$_{\text{regional}}$

Number of cars/trucks (originating from before 2005)	**Amount of c-PentaBDE per car/truck**	**Total amount POP-PBDEs in cars in use**
Cars: **8,555,928** x 0.12 = 1,026,711 Trucks: **136,223** x 0.12 = 16,347	**160 g/car**	**1,043,058 x 0.16 kg x 0.05= 8,344 kg**
Number of cars/trucks in use (originating from before 2005)	Amount of c-PentaBDE per car/truck	Total amount POP-PBDEs in cars in use (formerly originating from in 2010
Cars: **8,555,928** x 0.69 = 5,903,590 Trucks: **136,223** x 0.69 = 93,994	160 g/car	**5,997,584 x 0.16 kg x 0.05= 47,981 kg**
Number of cars/trucks in use (originating from **US/North America** before 2005)	Amount of c-PentaBDE per car/truck	Total amount POP-PBDEs in cars in use (formerly originating from US/North America in 2010
Cars: **8,555,928** x 0.07 = 598,915 Trucks: **136,223** x 0.07= 9,536	160 g/car	**608,451 x 0.16 kg x 0.5= 48,676 kg**
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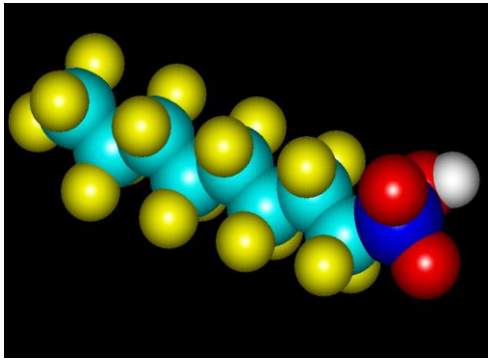
Total POP-PBDEs in cars and trucks and buses		**Sum of POP-PBDEs: 216,312 Kg**

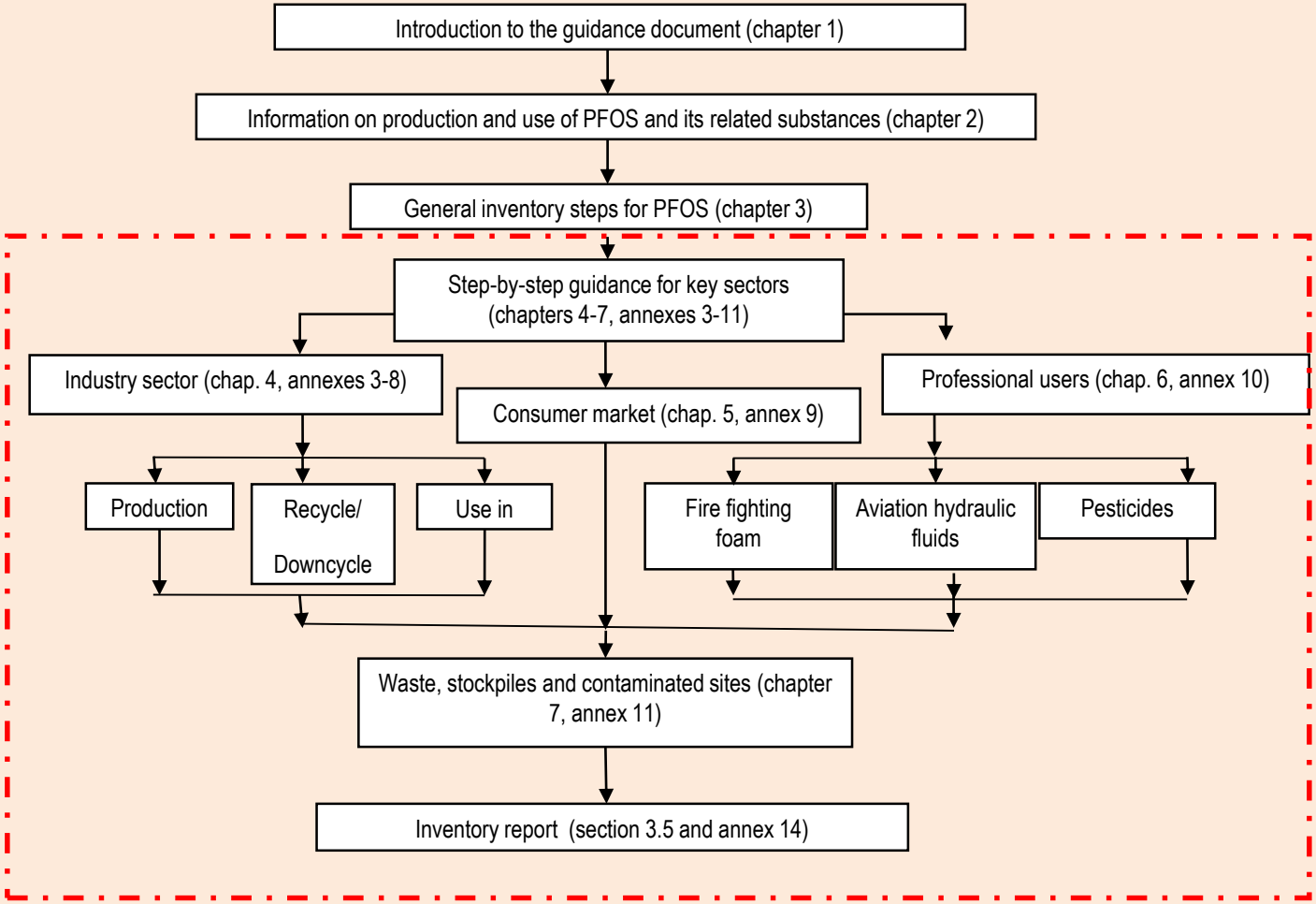
PFOS inventories

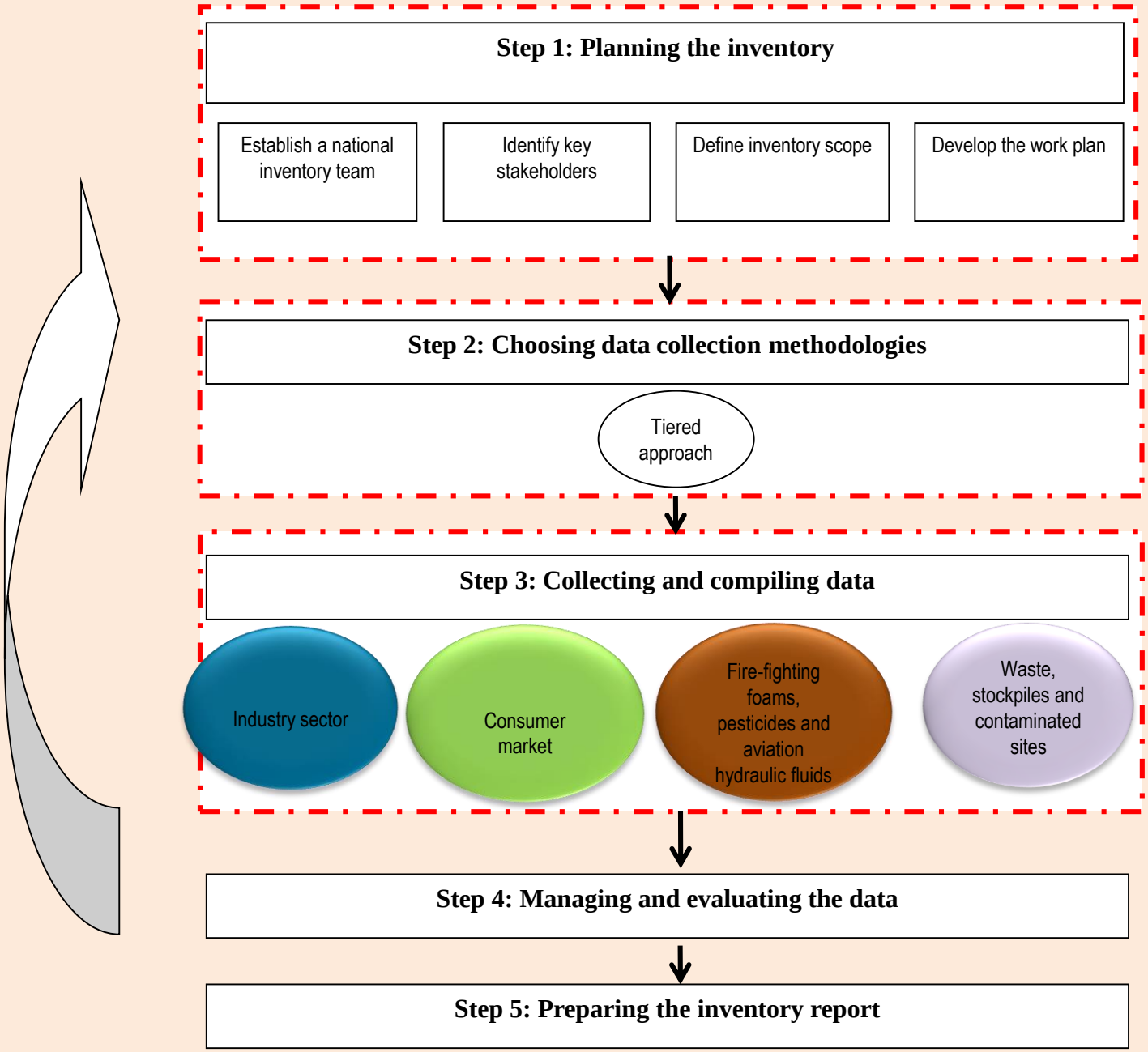


Listed: Annex B
(acceptable purposes and specific exemptions)

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

The structure of the Guidance




Step 1: Planning the inventory
Establish a national inventory team
Identify key stakeholders
Define inventory scope
Develop the work plan
Step 2: Choosing data collection methodologies
Tiered approach
Step 3: Collecting and compiling data
Industry sector
Consumer market
Fire-fighting foams, pesticides and aviation hydraulic fluids
Waste, stockpiles and contaminated sites
Step 4: Managing and evaluating the data
Step 5: Preparing the inventory report

Annex 5: QUESTIONNAIRE FOR SYNTHETIC CARPETS SECTOR

1. Name and address of the carpet producer or retailer:

Name	Address

2. Select all types of activity of your business that apply

Production of synthetic carpets	☐	Retailers of synthetic carpets	☐
Import of synthetic carpets	☐	Export of synthetic carpets	☐
Cleaning and reimpregnation of synthetic carpets	☐	Waste disposal of synthetic carpets	☐
Recycling of synthetic carpets to produce materials for other consumer products	☐	Others (Please specify):	

3. Select the type of synthetic carpets do you deal with

Synthetic carpets for households	☐	Synthetic carpets for any other indoor use	☐
Synthetic carpets for hotels	☐	Synthetic carpets for outdoor use	☐
Synthetic carpets for cars	☐	Old synthetic carpets for reuse or recycling	☐
Synthetic carpets for trains	☐	Others (Please specify):	☐

4. Indicate the properties of the carpets you deal with:

Water resistant/repellent	☐	Stain resistant	☐
Synthetic	☐	Dirt resistant/repellent	☐
Oil and grease resistant	☐	Contain flame retardants	☐
Other	☐	Please specify	

DRAFT

Table 4-1 Concentrations of PFOS in different chemical formulas and products

Chemical formulas and products	**Concentration of PFOS in chemical formula/product***	**References**
Aviation hydraulic fluids	0,05 - 0,1 %	DEFRA 2004
Fire-fighting foam	0,5-1,5 %	DEFRA 2004
Textile formula/polymer	1,0-2,0%	(Posner et al 2011)
Impregnation formula for synthetic carpets	2-5 %	(Posner et al 2011)
Impregnation formula for leather	about 1 %	UKEA 2004
Impregnation formula for paper and paperboard	About 1 %	(Posner et al 2011)
Coatings	0,1-1%	UKEA 2004
Insecticide	0,01-0,1%	UNEP 2010b

Key considerations - PFOS

Areas relevant for assessing PFOS

- Open applications:
  - FFF
  - Insecticide: SULFURAMID

Challenges

- Articles in use?
- Potentially contaminated sites:
  - Fire incidents (where fire fighting foam was used);
  - Fire fighting practice (air ports, refinery, oil);
  - Landfills.

GRACIAS!

For more information:

Contact: Jacqueline Alvarez
jacqueline.alvarez@une