

# Implementation of BRS Conventions for managing hazardous chemicals and wastes

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Module 5c

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# Management of waste oils

What are waste oils?

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Importance of the environmentally sound management of waste oils:

- Potential for direct re-use, reprocessing, reclamation and regeneration;
- If not properly handled, treated or disposed, can cause detrimental effects on human health and the environment.

# Waste oils

## Basel Convention Classification:

- Also referred as “used oils” or “spent oils”;
- Category Y8 in Annex I to the Basel Convention;
- Classified as A3020 in Annex VIII;
- Generally contain hazard characteristics H11, H12 and H13 in Annex III.

Waste oils	Y8	H11, H12, H13	A3020	Environmentally Hazardous Substances, Liquid, N.O.S., UN3082, Class 9
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H1=Explosive; H3=Flammable liquids; H8=Corrosives; H11=Toxic (delayed or chronic); H12=Ecotoxic; H13=Capable, by any means, after disposal of yielding another material which possesses any of the characteristics listed in Annex III

# Collection

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## Methods for collection:

- Assess existing collection practices and conditions
- By commercial, private collectors and/or recyclers directly from the “point-of-generation”
- For non-industrial waste oils, for example, by the user to a drop-off location
  - Retail stores
  - Service stations
  - Recycling centres
  - Oil banks

# Storage

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- When above threshold quantities (if set) license, permit or authorization;
- Tanks and containers regular inspection and maintenance;
- Secondary containment systems for single storage tanks capacity;
- Mixing waste oils should be prohibited.

# Transport

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- When above a certain amount annual amount per license, permit or authorization;
- United Nations Recommendations on the Transport of Dangerous Goods, Model Regulations packing, marketing, labelling, placarding;
- Class 9, UN 3082, waste environmentally hazardous substance, liquid, N.O.S;
- Emergency response information and hazardous waste tracking documents;
- Spill contain release and notify local emergency authorities.

# Transboundary movement

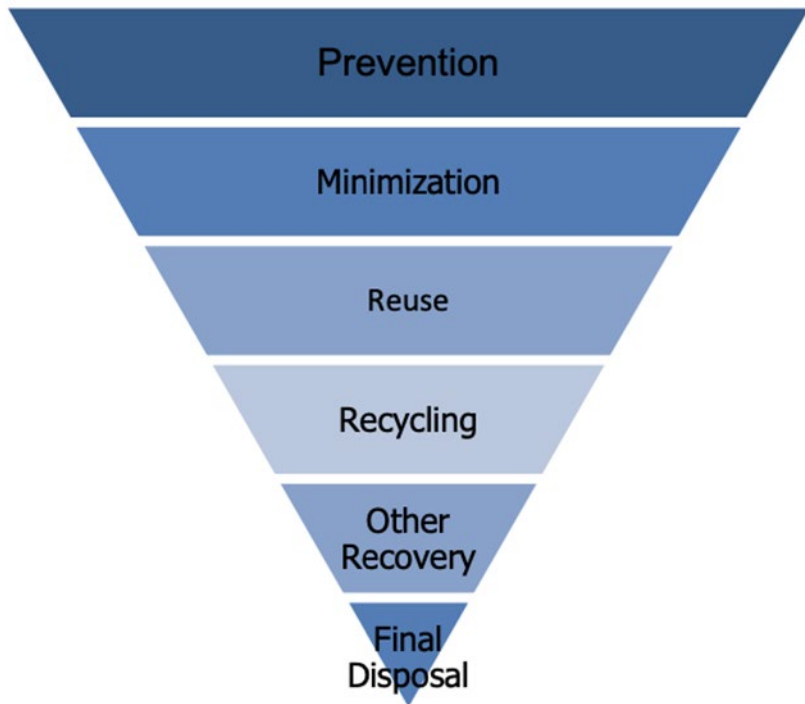
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Subject to the Basel Convention control procedure, which should be:

- Reduced to a minimum;
- Consistent with environmentally sound management of the wastes;
- Conducted in a way which will protect human health and the environment.

# Environmentally-sound waste management

## Waste hierarchy



- Only treated in properly licensed/permitted/authorised facilities
- Manage in accordance with waste management hierarchy, priority to options with best overall environmental outcome
- Waste oils for regeneration must have low POP content (PCDD/PCDF, PCB, chlorinated additives)
- Recommended as preferable for regeneration: engine oils without chlorine, hydraulic oils without chlorine, non-chlorinated mineral diathermic oils
- Use of waste oil as fuel – carefully consider emissions to air and disposal of residual wastes
- Quality assurance system in place + performance standards can be set
- Open burning of waste = inadvertent source of POPs under Stockholm Convention, should be banned.



# Environmentally-sound waste management

<b>Constituent/Property</b>	<b>Allowable Level</b>
Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Lead	100 ppm maximum
Flash Point	100 °F (~37,7°C) minimum
Total Halogens	4000 ppm maximum
PCBs	Less than 0.2 ppm

Table 1. U.S. waste oil specifications for energy recovery<sup>(22)</sup>

When using waste oil as fuel:

- Quality assurance system to guarantee the characteristics of the waste produced;
- Performance standards in order to avoid equipment failures or higher emissions;
- Waste oil specifications to describe quality or specify maximum level of contaminants (e.g. see Table 1).
- Properly controlled co-processing of waste oil in cement kilns;
- Use of waste oils for domestic uses should be discouraged.

# Environmentally-sound waste management

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- Extender Producer Responsibility (EPR) covering waste oils.
- Certification and Auditing Systems:
  - Environmental management systems (EMS);
  - Non-standardized systems.

# Identifying reuse and recycling options

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Criteria that needs to be considered:

- Extent to which used oil can be treated;
- Potential harm to human health and the environment;
- Economic balance and market opportunities;
- Transport requirement/costs;
- Location of treatment facilities;
- Processing of hazardous waste contaminants and by-products of the process;
- Worker safety.

# Stockholm Convention

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## Article 5 / Annex C provisions

- Each Party shall take measures to reduce the total releases derived from anthropogenic sources of each of the chemicals listed in Annex C with the goal of their continuing minimization and, where feasible, ultimate elimination.
- Waste oil refineries are listed in Annex C, Part III, as source with potential to form and release chemicals listed in Annex C.
- Waste oils (or used oils) are defined as any petroleum-based, synthetic, or plant- or animal-based oil that has been used.
- Two large sources: industrial waste oils, and vegetable and animal waste oils.
- Among industrial waste oils, three main oil streams: industrial oil (e.g. hydraulic oil, engine lubricant, cutting oil); garage or workshop oil; and transformer oil.

# Waste oil refineries

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## UPOPs formation and release

- No evidence that PCDD/PCDF or PCB are newly formed in waste oil refineries.
- PCDD/PCDF and PCB released from waste oil refineries or waste oil handling and management plants are from the industrial, intentional production of PCB or chlorobenzenes that are present in waste oils either by contamination in the synthesis process (of these chemicals) or have become contaminated during the use phase or earlier recycling processes.
- Waste oil collected will end up in other processes: waste incineration, power plants, domestic heating and cooking, cement kilns, brickworks, asphalt mixing stations, or transportation.
- Other sources from diffuse emissions during storage and handling, spills, improper disposal.

# Treatment of waste oils

## BAT BEP Guidance

- Two main options for the treatment of waste oils:
  - Recovery of waste oil to be used as a fuel or reductant. This includes treatments such as thermal cracking and gasification, but also milder treatments of waste oils;
  - Treatment of waste oil to reconvert it into a material that can be reused or used as a base oil to produce lubricants (re-refining).
- Waste oils to be preferred for regeneration:
  - Engine oils without chlorine;
  - Hydraulic oils without chlorine;
  - Non-chlorinated mineral diathermic oils.
- Treatments of waste oils other than re-refining:
  - Different burning applications, distinguishable partly by the temperature at which they burn, and partly by the control technology they use to reduce environmental effects.
  - Before use as fuel, several cleaning or transformation treatments may be needed in order to achieve the requirements for further use.

# BAT BEP for waste oil refineries

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## Conclusions

- Waste oils have been found to be contaminated with PCDD, PCDF and PCB;
- At present there is no available evidence that PCDD, PCDF and PCB are newly formed in waste oil refineries;
- Waste oil refineries are a distribution source of chemicals listed in Annex C rather than a formation source;
- The waste oil treated in waste oil refineries must have a low content of PCDD, PCDF, PCB and chlorinated additives.

# Resources: Stockholm Convention

Basel Convention | Rotterdam Convention | Stockholm Convention | Synergies

UN environment programme **STOCKHOLM CONVENTION**  
Protecting human health and the environment from persistent organic pollutants

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**BAT/BEP**

- Overview
- Decisions
- Guidance
- Implementation & Evaluation
- Meetings
- Additional Resources
- Partnerships

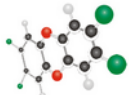
## BAT and BEP Guidance

To facilitate implementation of **Article 5**, Parties review of comparable release inventories of **Annex C** chemicals, **available techniques and guidance on best environment**

The Guidelines on best available techniques and guidance called for in paragraph c) of the Article 5:



Stockholm Convention on persistent organic pollutants (POPs)



### Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs under Article 5 of the Stockholm Convention on Persistent Organic Pollutants



**Preface, Acknowledgements, Abbreviations and Acronyms**

The *Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs* is intended to assist parties in establishing release inventories of unintentional POPs that are consistent in format and content, ensuring that it is possible to compare results, identify priorities, mark progress and follow changes over time at the country level, as well as regional and global levels.



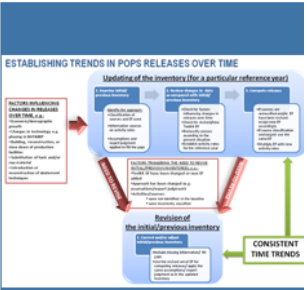
[Access the Toolkit download page](#)

[More](#)

### Part I General Guidance

The *Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs* is divided into three parts.

**Part I** includes general guidance for inventory development, update and revision, guidance on data quality and quality assurance and quality control of inventory results, guidance to determine activity rates, and others aspects.



[Access the inventory update and revision explanation](#)

[More](#)



# Resources: Basel Convention Waste Oils Factsheet

- Classification
- Collection
- Storage
- Transport
- Transboundary Movement
- Environmentally Sound Management
- Extended Producer Responsibility
- Certification and Auditing Systems

## FactSheet

### WASTE OILS

This fact sheet is part of a series of fact sheets to support the implementation of the environmentally sound management (ESM) of hazardous wastes and other wastes, in accordance with the obligations of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. The fact sheet provides information on the ESM of waste oils, also sometimes referred to as "used oils" or "spent oils". It is primarily intended for those involved in the collection and management of waste oils.

This fact sheet should be read in conjunction with the **Technical Guidelines on Waste Oils from Petroleum Origins and Sources (Y8)**, and the **Technical Guidelines on Used Oil Re-Refining or Other Re-Uses of Previously Used Oil (R9)**, developed under the Basel Convention<sup>(1,2)</sup>.

#### Classification

Waste oil belongs to category Y8 in Annex I of the Basel Convention, and is further classified as A3020 in Annex VIII.

Waste oils are generally considered to possess hazard characteristics H11, H12 and H13 in Annex III. Waste oil commonly contains carcinogenic polycyclic aromatic hydrocarbons (PAHs), used motor oil, in particular, also contains heavy metals from certain additives and metal particles from engine wear.

It is worth noting that for the environmentally sound management of waste oil containing or contaminated with PCB, technical guidelines have been developed under the Basel Convention which in particular address waste oil with a PCB concentration above 50mg/kg<sup>(10,11)</sup>. Some countries have established stricter provisions. Chlorinated compounds can lead to corrosion of equipment and present a health hazard when incompletely combusted<sup>(9, 10, 11)</sup>.

#### Collection

A first step to implementing an effective collection system is undertaking a detailed assessment of existing collection practices and conditions (infrastructure, costs, legal framework, etc.). A situation and gap analysis could be used to help identify strengths and areas for improvement. Establishing clear goals and objectives (e.g. to increase the collection of waste oil; to promote investments in collection and processing infrastructure) aimed at solving these problems can help guide the subsequent planning process, and

<sup>1</sup> Provisional low POP content level established under the Stockholm and Basel Conventions above which destruction or irreversible transformation of the persistent organic pollutant content is required.

quantitative targets can be used to measure whether objectives have been met<sup>(3,4,5)</sup>.

**Policy instruments:** An appropriate mix of policy instruments (regulatory, economic and information-based measures) should be adopted, taking into account the political, social, economic, legal and cultural context (e.g. existence of informal collectors)<sup>(7)</sup>. Voluntary industry measures (e.g. take-back programmes) may be part of policy solutions<sup>(9)</sup>.

**Regulatory instruments** refer to direct government regulations such as technology mandates and performance standards. A basic feature of any regulatory framework is authorisation of related activities to ensure an environmentally sound operation, operators are known and report to the government on quantities handled. To make it easier for small-scale collectors to comply, a simplified licensing process could be applied to collectors under a certain threshold size.

**Economic instruments** may be used to encourage

Approximately 40 to 50% of the lubricants sold are consumed or lost during use; the remaining 60 to 50% of the oil is potentially recoverable<sup>(12)</sup>.

desirable behaviour (e.g. through subsidies) or to discourage undesirable behaviour (e.g. through taxes or charges), to guide actions towards sustainable production and consumption<sup>(9)</sup>. When planning economic instruments, the market realities should be carefully considered<sup>(7)</sup>. For economic instruments to work effectively, regulations need to be clear and the compliance enforcement capacity adequate<sup>(9)</sup>. Economic instruments could include: product taxes; advance recycling fees; subsidies; tax differentiation; extended producer responsibility; deposit/refund schemes; green public procurement (giving preference to lubricants that do not contain certain hazardous substances).

**Information-based policy instruments** aim to raise the awareness by providing information e.g. practical guidelines for the environmentally sound storage, collection, transport, recycling and final disposal of waste oil could be developed. The awareness of the stakeholders should be raised about the risks of inappropriate disposal of waste oils, good management practices, the value of waste oil if not mixed with other fluids, collection options, and penalties for non-compliance with regulations<sup>(9)</sup>.

## Other Basel Convention resources:

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- [Technical Guidelines on Waste Oils from Petroleum Origins and Sources \(1994\)](#);
- [Technical Guidelines on Used Oil Re-Refining or Other Re-Uses of Previously Used Oil \(1995\)](#);
- [The United Nations Recommendations on the Transport of Dangerous Goods, Model Regulations](#);
- [Manual for the Implementation of the Basel Convention](#).
- [Guide to the Control System](#)

# National reporting

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- Frequency: annually.
- Format: revised questionnaire on “transmission of information” and a manual for the questionnaire, which can be found on the Convention website.
- Procedures and Processes of the Secretariat:
  - Electronic Reporting System for use by Parties to submit annual national reports (Focal Point has access information)
  - The Secretariat conducts quality control of the data and information, and seeks for clarification when necessary.

# National reporting

- Previously submitted National reports available online
  - <http://www.basel.int/Countries/NationalReporting/NationalReports/BC2019Reports/tabid/8645/Default.aspx>
- Resources to support national reporting: Secretariat assistance; format and manuals for national reporting; procedures website page.



# NATIONAL REPORTING

Article 13(3) sets  
out reporting  
obligations for  
Parties

3. *The Parties, consistent with national laws and regulations, shall transmit, through the Secretariat, to the Conference of the Parties established under Article 15, before the end of each calendar year, a report on the previous calendar year, containing the following information:*

- a. *Competent authorities and focal points that have been designated by them pursuant to Article 5;*
- b. *Information regarding transboundary movements of hazardous wastes or other wastes in which they have been involved, including:*
  - i. *The amount of hazardous wastes and other wastes exported, their category, characteristics, destination, any transit country and disposal method as stated on the response to notification;*
  - ii. *The amount of hazardous wastes and other wastes imported, their category, characteristics, origin, and disposal methods;*
  - iii. *Disposals which did not proceed as intended;*
  - iv. *Efforts to achieve a reduction of the amount of hazardous wastes or other wastes subject to transboundary movement;*
- c. *Information on the measures adopted by them in implementation of this Convention;*
- d. *Information on available qualified statistics which have been compiled by them on the effects on human health and the environment of the generation, transportation and disposal of hazardous wastes or other wastes;*
- e. *Information concerning bilateral, multilateral and regional agreements and arrangements entered into pursuant to Article 11 of this Convention;*
- f. *Information on accidents occurring during the transboundary movement and disposal of hazardous wastes and other wastes and on the measures undertaken to deal with them;*
- g. *Information on disposal options operated within the area of their national jurisdiction;*
- h. *Information on measures undertaken for development of technologies for the reduction and/or elimination of production of hazardous wastes and other wastes; and*
- i. *Such other matters as the Conference of the Parties shall deem relevant.*

# National reporting

## Basel Convention National Reporting



The cover of the on-line reporting database of the Basel Convention features a blue and white abstract background. At the top right, the logos for the Basel Convention (a stylized 'B' with a green leaf) and UNEP (United Nations Environment Programme) are displayed. The main title, 'The on-line reporting database of the Basel Convention', is centered in a white box with a blue border. Below the title, there are sections for 'Introduction' and 'Purpose'.

**Basel CONVENTION**  
the world environmental agreement on wastes

**UNEP**

### The on-line reporting database of the Basel Convention

#### Introduction

Parties to the Basel Convention are required to transmit their national reports to the Secretariat of the Basel Convention (SBC) annually, pursuant to paragraph 3 of Article 13 of the Basel Convention. The online reporting database of the Basel Convention, developed by the SBC, provides access to data and information contained in these national reports.

Secretariat of the Basel Convention, by the Finnish Environment Institute (SYKE).

#### Purpose

The purpose of the online reporting database is to efficiently manage, process and retrieve data and information contained in the national reports transmitted by Parties, annually, to

# Other resources

- Guidance on inventory of hazardous wastes
- Guidance on national reporting
- Benchmark report
- Waste without Frontiers II



# Thank you



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UNEP-Norway Partnership

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