Regional Meeting to review the used lube oil ESM guidelines and best practices towards sustainable tannery sector in the Mediterranean

July 22nd – 24th, 2015 - Barcelona

Guide on the Environmental Sound Management (ESM) of used oil in the Mediterranean

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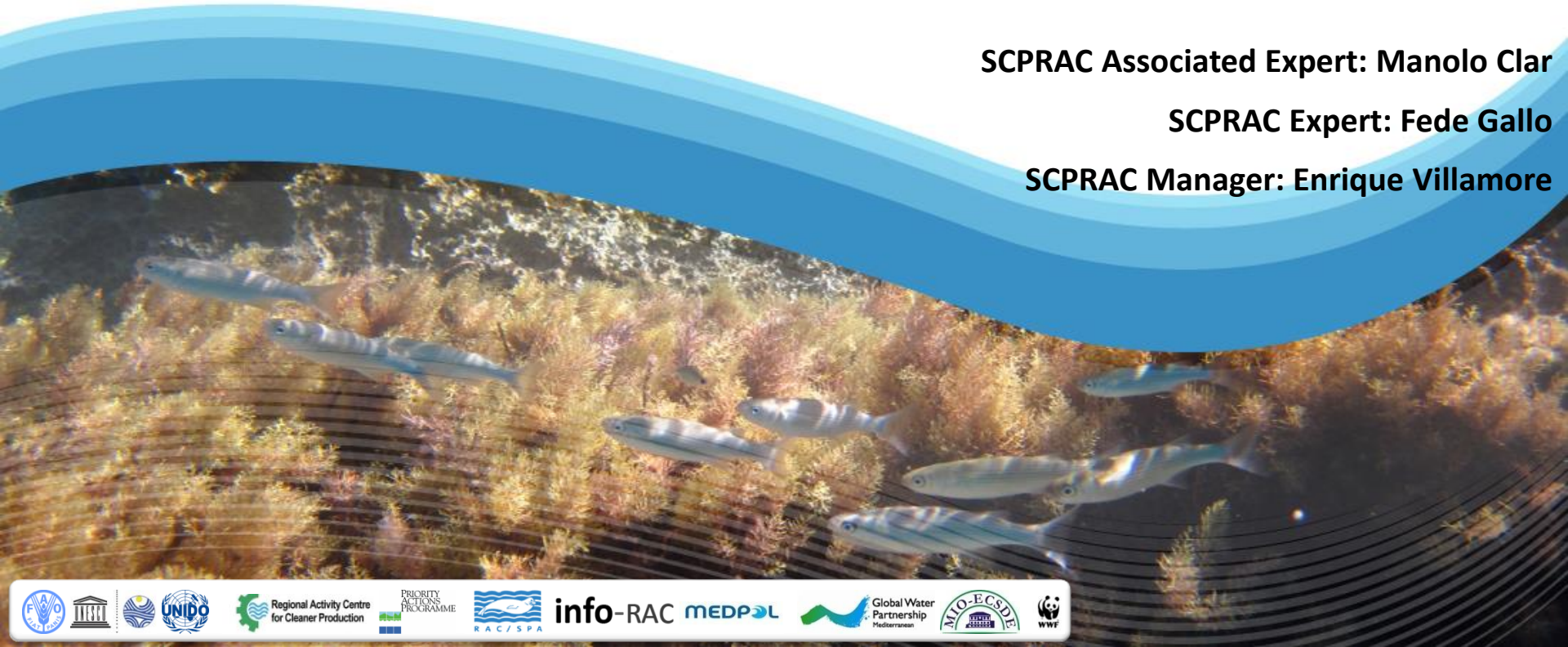

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1. Introduction

Guide developed by UNEP MAP on the framework of the project **Sub-component 2.1** which aims at facilitating policy and legislation reforms for pollution prevention and control of the **Medpartnership project**.

Update or extension work of the study developed by the SCPRAC in the year 2000 called **“Possibilities for the recycling and reusing of used oils”.**

1. Introduction

Objective of the guide

The guide is focused on providing **possible steps to the environmentally sound management (ESM) of used oils in Mediterranean countries**.

The final objective of this guide is to provide information to Mediterranean countries to establish **a 100% regeneration system to recycle used oils** in their respective countries.

1. Introduction

Contents of the guide

Chapter 1 provides background information, the scope of the document, information on **ecolabeling for lubricants** and alternatives to lubricants, in particular **bio-lubricants**.

Chapter 2 provides data and **information** on used oils, **associated environmental problems** caused by used oils as well as information on the **main technologies** for used oil treatment.

Chapter 3 describes in plain and simple language the **possible steps** to the environmentally sound management of used oils that can generally be applied to any given country that goes **from stakeholder engagement to final re-refining/ recycling**.

Chapter 4 shows several **case studies** on pollution prevention of used oils.

2. Chapters of guide

Chapter 1. 1.1. Prevention of pollution. Alternatives to mineral oils: Biolubricants

Biolubricants, also known as biolubes and bio-based lubricants, apply to all lubricants that **biodegrade rapidly** and which are **non-toxic** for human beings, fauna, flora and aquatic habitats.

Biolubricants are made of **vegetable oils** such as **soybean, canola (rapeseed), sunflower, palm, coconut oils, etc.** Biolubricants can also be made of **synthetic esters** manufactured from modified renewal oils.

The **preferred application** of biolubricants are **those that might pose a risk for the environment**, especially on aquatic, mountain, agricultural and forest environments, although **they can be used in all applications**.

Fig. 1. Aspecto físico de la biograsa de aceite vegetal de *Jatropha curcas* L y jabón de litio

2. Chapters of guide

Chapter 1. 1.1. Prevention of pollution. Alternatives to mineral oils: Biolubricants

The key advantages of biolubricants are **rapid biodegradability, low toxicity in the environment, environmental friendliness, good lubricating properties, high viscosity index, longer equipment life, contribution to improved water quality, reduction of greenhouse gases, increase on economic security and reduction of oil dependence**.

Approximately **85% of all lubricants** presently being used in the world **are petroleum based oils**. Nevertheless, the market for more biolubricants has been growing at a slow but steady pace. Europe has been leading the biobased lubricant market and it is **expected to grow to 18% of the market in the coming years.**




2. Chapters of guide

Chapter 1. 1.2. Ecolabels for lubricants

The **European Union Ecolabel** helps consumers to **identify products and services that have a reduced environmental impact** throughout their life cycle.

The products that can apply for the ecolabel cover **hydraulic fluids, tractor transmission oils, greases, stern tube greases, chainsaw oils, concrete release agents, wire rope lubricants, two-stroke oils, industrial and marine gear oils, stern tube oils and other total loss lubricants** for use by private consumers and professional users.

2. Chapters of guide

Chapter 1. 1.2. Ecolabels for lubricants

In order to apply for the European Ecolabel, lubricants have to meet requirements for **performance, show limited toxicity to aquatic organisms, have high biodegradability and low potential for bioaccumulation and contain a high fraction of renewable (bio-based) raw materials**.

Other nationally and internationally recognized ecolabels for lubricants include **Blue Angel (Germany), Swedish Standard (Sweden), Nordic Ecolabel (Norway, Sweden, Finland, Iceland, and Denmark) and OSPAR Commission**.

OSPAR COMMISSION
Protecting and conserving the North-East Atlantic and its resources

Discussion / questions / ideas / proposals

2. Chapters of guide

Chapter 2. Used oils and the environment

2.1 Introduction

”Used oils" are **all mineral or synthetic industrial oils or lubrication, which have stopped being suitable for the original intended use**, such as used combustion engine oils, gearbox oils, turbines, hydraulic oils and lubricants.

Used oils are also **priority substances** to be taken into account for the contracting Parties to the **Barcelona Convention** when preparing programs and measures against pollution, according to the **Land Based Sources (LBS) Protocol**. Used oil as a hazardous waste is also covered by the **Basel Convention** on control of transboundary movements of hazardous wastes and their disposal.

2. Chapters of guide

Chapter 2. Used oils and the environment

2.1 Introduction

Used oil is a **dangerous polluting product**, usually generated by its use as a lubricant in automotive vehicles and in industrial operations and classified as hazardous waste according to European environmental legislation.

Used oil mainly contains **three types** of dangerous **pollutants**:

Polynuclear aromatic hydrocarbons (PAHs);

Heavy metals; and

Lubrication additives.

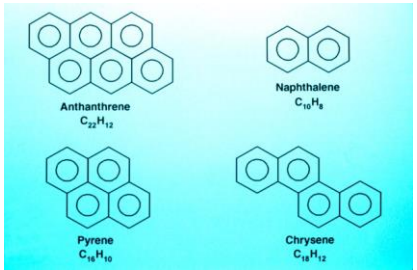
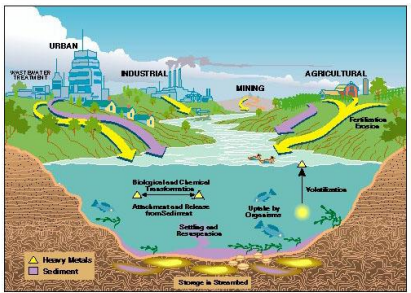


Figure 21--*Sources and Sinks of Heavy Metals*



2. Chapters of guide

Chapter 2. Used oils and the environment

2.1 Associated environmental problems

Effects on wetlands, rivers, marine and fresh water organisms

Chronic pollution due to used motor oil coming from automotive traffic and industrial activity reaches **millions of tons yearly**.

When oil is poured into the water, it forms a layer on the surface, which **prevents oxygenation and it can suffocate and kill living organisms** that inhabit the water.

2. Chapters of guide

Chapter 2. Used oils and the environment

2.1 Associated environmental problems

Effects on wetlands, rivers, marine and fresh water organisms (cont.)

Four liters of used oil can generate a **spot of 4000 m²** on water.

Spilled used oil may also result in **higher concentrations of PAHs** in wetlands, rivers, bays, oceans and sediments.

Dumping used oil on water bodies can **negatively affect fish and benthic macroinvertebrate communities** even **killing** a large number of fish and other fauna.

2. Chapters of guide

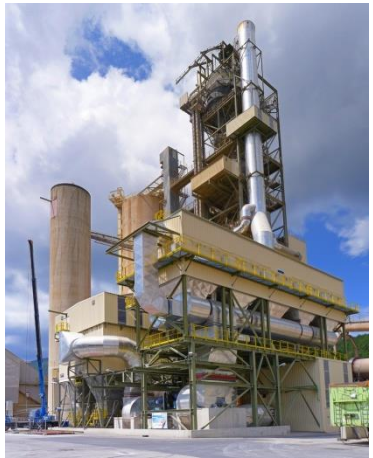
Chapter 2. Used oils and the environment

2.1 Associated environmental problems

Effects on air pollution

Used oil pollution can also **damage the atmosphere** when used oil is burned **without high tech filtering measures**.

When used oil is burned without high tech filtering measures, **toxic gases** and **harmful metallic dust particles** are produced due to the presence of **heavy metals** and other **organic compounds, sulfur, chlorine and aromatics**.



2. Chapters of guide

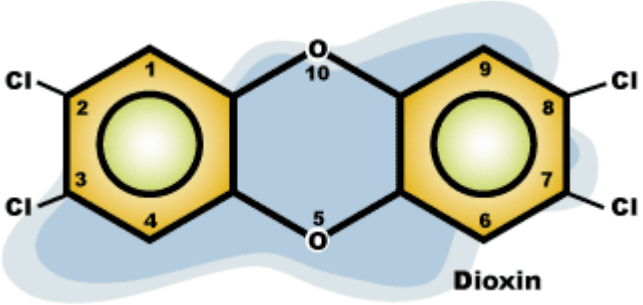
Chapter 2. Used oils and the environment

2.1 Associated environmental problems

Effects on air pollution (cont.)

The high concentration of metals (including heavy) that used oil contains such as **lead, arsenic, nickel, cadmium, zinc, chromium, copper and magnesium** can be very toxic to ecological systems and to human health.

If other pollutants are present on the used oil such as **PCBs**, the air pollution might be even more dangerous, generating **dioxins, furans and other carcinogenic subproducts**.



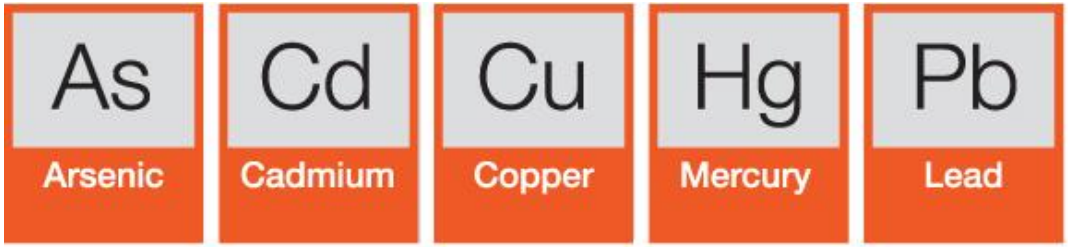
2. Chapters of guide

Chapter 2. Used oils and the environment

2.1 Associated environmental problems

Human health effects

Besides the content of hydrocarbons and additives (metals, detergents, etc.) in the lubricant oil, used crankcase oil contains **contaminants that accumulate during the operation of the engine**. Sources of contamination include additive breakdown products such as **barium and zinc and heavy metal particles** from engine wear. If **repeated or prolonged ingestion or dermal exposure occur**, it is quite obvious that relevant health effects on humans will happen. All these compounds, especially heavy metals are **highly toxic to organisms**.



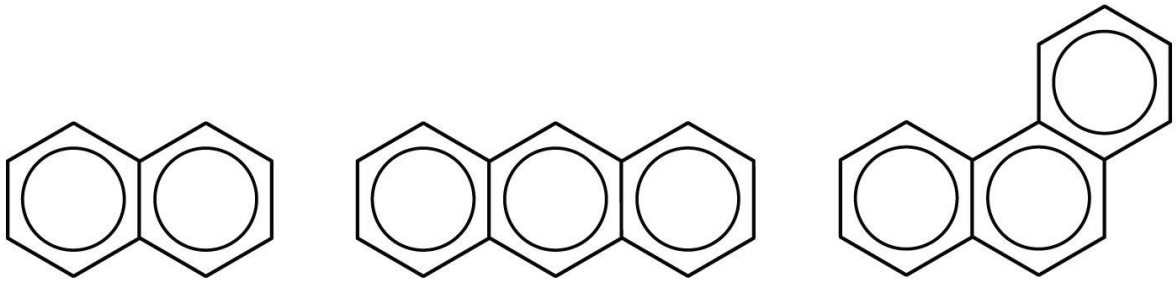
2. Chapters of guide

Chapter 2. Used oils and the environment

2.1 Associated environmental problems

Human health effects

In addition, **polycyclic aromatic hydrocarbons (PAHs)** become highly concentrated from the combustion of lubricant oil and fuel in the engine cylinders. PAHs concentration increases in the crankcase oil with operating time. **If used oil is improperly manipulated**, people, therefore, might be **exposed via inhalation to high levels of PAHs.**



Naphthalene Anthracene Phenanthrene

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Chapter 2. Used oils and the environment

2.1 Associated environmental problems

Dangerous practices for human health and the environment

As a hazardous waste, used oils **should only be managed by authorized waste managers.** Enforcement control campaigns should be developed to detect non-authorized practices.

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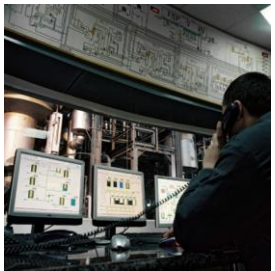
Chapter 2. Used oils and the environment

2.3 Main technologies of used oil treatment

There are two main options for the treatment of used oil:

1. One method is to reconvert used oil into a material that can be used as **base oil to produce new lubricants**. This process is referred as **regeneration (re-refining).**
2. Another method to treat **used oil is as fuel** (**energy recovery**). In order to comply with European legislation and international standards, **a strict treatment is needed** to remove contaminants such as organic compounds, chlorides and heavy metals and be **treated in authorized plants** for energy recovery.



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Chapter 2. Used oils and the environment

2.3 Main technologies of used oil treatment

Different processes that exist on the European market

This process produces base oils that are separated into different **commercial fractions of viscosities in order to get marketable lubricants**. These different fractions are often blend with additives. This process generates minimal waste.

The different base oil fractions obtained are the following:

80N-100N;

150N-200N; and

300N-350N.

2. Chapters of guide

Chapter 2. Used oils and the environment

2.3 Main technologies of used oil treatment

Base oil qualities (API (American Petroleum Institute) Group I, Group II depending on technology) are **similar or even better than primary products**.

Group I

1. Technology of the enhanced selective-refining plant
2. Sotolub process
3. Technology TDA (thermal deasphalting)
4. Interline technology
5. Vaxon technology with chemical treatment

Group II

1. Ecostream
2. The hylube^{tm} process
3. Revivoil process

API BASE OIL CATEGORIES

	Base Oil Category	Sulfur (%)		Saturates (%)	Viscosity Index
Mineral	Group I (solvent refined)	>0.03	and/or	<90	80 to 120
	Group II (hydrotreated)	<0.03	and	>90	80 to 120
	Group III (hydrocracked)	<0.03	and	>90	>120
Synthetic	Group IV	PAO Synthetic Lubricants			
	Group V	All other base oils not included in Groups I, II, III or IV			

Discussion / questions / ideas / proposals

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Proposed Steps	
Step 1	Appointment of Ministry/Department responsible for used oil management
Step 2	Initiate a dialogue, awareness and training campaign and partnership with stakeholders
Step 3	Pass a law on used oil management and financial plan
Step 4	Create database of consumption of new lubricant oils
Step 5	Create a database of recovered used oil, ratios and objectives
Step 6	Initiate used oil collection logistics
Step 7	Establish used oil transfer centers
Step 8	Establish regeneration/re-refining plants of used oil

2. Chapters of guide

Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 1. Appointment of Ministry/Department responsible for used oil management

The first proposed step is to assure a proper management of used oils by **appointing the Ministry or public administration and department responsible** for the management of used oils in the country, which should ensure the following:

- **Development, adoption and enforcement of laws** and specific environmental regulations for the **management of used oils**; and

- **Generation of statistics** on established objectives and degree of objectives compliance.

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 2. Initiate a dialogue, awareness and training campaign and partnership with stakeholders

Stakeholders can be defined as **any individual, group of people, institutions or firms who have a significant interest and/or role** on the success or failure of a project.

Main key stakeholders		
National Government	Used Lubricant Producers	Workers Unions
Regional Government	Hazardous Waste Management Companies Association	NGOs (Non-governmental Organizations)
Local Government	Hazardous Waste Transport Companies Association	Academia
Lubricant Manufacturers Association	Consumers Association	Media

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Table. Stakeholder analysis matrix

Stakeholder and basic characteristics	Interests and role in the ESM of used oils	Capacity and power to participate on the ESM of used oils	Possible actions to involve stakeholder
National government…			

Then, we could **conduct specific awareness and training activities** for key stakeholders.

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 3. Pass a law on used oil management and financial plan

In order to properly manage used oils, the legal framework could be based on the following principles:

- The principle of "**Extended Producer Responsibility" (EPR),** or the **"polluter-pays principle"** should be applied as regards responsibilities and funding;
- Definition of **ecological objectives** to be achieved;
- Management could be based on **Waste framework Directive 2008/98/EC of the European Union on Article 4**. Waste hierarchy as priority order and **Article 21**. Rules for Used oil Management.

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

"**Extended Producer Responsibility" (EPR) / "polluter-pays principle"**

Makers and importers of oils and lubricants placed on the market should have the **obligation of securing financing to assure the wise management of waste oil** in the country, individually as a company or through a **National Integrated Management Systems (IMS)**.

Lubricant manufacturers and importers are **responsible for the production** of used oils. They are also **responsible for compliance with ecological objectives**.

Used oil producers and holders must ensure its **delivery to an authorized waste manager to its recycling**.

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Definition of ecological objectives to be achieved.

Ecological objectives should be established by law. **If a 100% regeneration objective is established**, it should comply with the following:

- **Collecting 100% of oil produced** (corresponds to **40% of new lubricating oil** consumed annually);
- **Regeneration of 50% of collected oil (proposed minimum by Law at the beginning) (Example: 65% in Spain, 80% in Italy, 100% in Catalonia region, Spain)**, which is usually reviewed every 5 years; and
- Energy use. **Using as fuel once used oil has been treated** in plants and **by authorized consumers** such as cement plants and incinerators.

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Waste framework Directive 2008/98/EC of the European Union.

Article 4. The priority order from best to worst solution to waste oil is the following:

- **Prevention** (no production of used oil);
- Preparing for **re-use**;
- Recycling meaning **regeneration/ re-refining**;
- Other recovery such as **energy recovery** (burned after treatment as secondary fuel) and incineration (burning of used oil); and
- **Disposal**.

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Disposal. **Article 21** exposes about the rules for used oil management stating the following:

- Used oils have to be **collected separately**, where this is technically feasible;
- Used oil must be treated in accordance with the **waste hierarchy**;
- **Prohibition of mixing used oils with other kinds of waste or substance** if this impede its right treatment; and

- Measures (technical, organizational, economic) should be applied to **ensure separate collection and proper treatment**.

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

The used oil regulation should also include:

Object and scope of application; Definitions; business plans prevention and reuse; obligations regarding storage and treatment of used oils; delivery system of used oils; Management priority; Ecological objectives; Material valuation. Regeneration; Energy use of used oils. Burning; Integrated Management Systems; Financing of Integrated Management Systems; Information to the public administration; Information campaigns and awareness; Penalties; Annexes; Documents which have to be delivered by economic agents to the public administration; Document for controlling and monitoring of used oils; and Document controlling the transfer of used oil of small producers and workshops to authorized collectors (annual quantity collected less than 5000L) and document for large producers (annual quantity collected more than 5000L).

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Financial plan

Lubricant makers and importers should be **obliged to secure financing** to assure the sound management of used oil in the country

Integrated Management Systems are usually **financed by an amount per kg of oil or lubricant sold** on the market.

Integrated Management Systems will finance then **all costs associated with the proper management of used oils including a reasonable profit** for all companies involved in the process (**usually 7-8% for Spain**).

In the case of Spain, the **profitability** of the waste management system including used oil regeneration is **guaranteed by the IMS** as established in a Real Ordinance.

No funding should usually be devoted for used oil use **for energy recovery**.

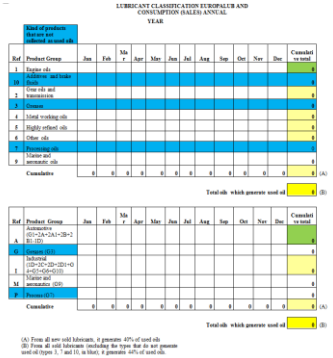
2. Chapters of guide

Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 4. Create database of consumption of new lubricant oils

The next step is to create a **national database of consumption of lubricant oil** in order to have available (**monthly and annual**) information on the **amount** and **types of lubricants** which are **consumed** (sold).

This information must be **provided by lubricant manufacturers and importers**, individually or through industry associations to the government.


LUBRICANT CLASSIFICATION EUROPA/UE AND CONSUMPTION (SALES) ANNUAL
YEAR

Ref	Product Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cumulative total
1	Engine oils													0
10	Additives and brake fluids													0
2	Gear oils and transmission													0
3	Greases													0
4	Metal working oils													0
5	Highly refined oils													0
6	Other oils													0
7	Processing oils													0
9	Marine and aeronautic oils													0
Cumulative		0	0	0	0	0	0	0	0	0	0	0	0	0 (A)
Total oils which generate used oil														0 (B)

Ref	Product Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cumulative total
A	Automotive (G1=1A+2A1+2B+2B1-2D)													0
G	Greases (G3)													0
I	Industrial (G2=2C+2D+2D1+2a+G3+G6+G13)													0
M	Marine and aeronautics (G9)													0
P	Process (G5)													0
Cumulative		0	0	0	0	0	0	0	0	0	0	0	0	0 (A)
Total oils which generate used oil														0 (B)

(A) From all new sold lubricants, it generates 45% of used oils
(B) From all sold lubricants (including the types that do not generate used oil (types 3, 7 and 10, in blue)), it generates 44% of used oils.

2. Chapters of guide

Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 5. Create a database of recovered used oil, ratios and objectives

The next step proposed is to create a **national database of recovered used oil** and the **final use of collected used oil**.

DATA BASE DE USED OIL COLLECTED

	Used oil collected (tons)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cumulative total
1	Total													0

RECOVERED USER OIL

YEAR

	Recovered used oil (tons)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cumulative total
1	IN COUNTRY (1)													
1.1	Regeneration/ re-refining													0
1.2	Combustion (replacing heavy fuel oil)													0
1.3	Combustion (replacing coal)													0
1.4	Other uses recycled													0
	TOTAL IN COUNTRY USED	0	0	0	0	0	0	0	0	0	0	0	0	0
2	FOR EXPORT (2)													
2.1	Regeneration/ re-refining													0
2.2	Combustion (replacing heavy fuel oil)													0
2.3	Combustion (replacing coal)													0
2.4	Other uses recycled													0
	TOTAL USES FOR EXPORT	0	0	0	0	0	0	0	0	0	0	0	0	0
3	TOTAL (1) + (2)													
3.1	Regeneration/ re-refining													0
3.2	Combustion (replacing heavy fuel oil)													0
3.3	Combustion (replacing coal)													0
3.4	Other uses recycled													0
	TOTAL RECOVERED IN COUNTRY + EXPORT	0	0	0	0	0	0	0	0	0	0	0	0	0

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 5. Create a database of recovered used oil, ratios and objectives

RESULTS OF USED OIL MANAGEMENT			Quantity (tons)		
			2013	2014	2015
NEW LUBRICANT OIL AND GENERATED USED OIL					
1	**Consumption of new oils (no types 3, 7, and 10)**		0		
2	Products that are not collected as used oil (types 3, 7 and10)		0	0	0
3	Total consumption of new oils	1+2	0	0	0
4	Used oil potentially generated (tons / %) (est. 44%)	3 of 1	0	0	0
USED OIL COLLECTED					
5	**Used oil collected and sent to recovery**		0	0	0
RECOVERED USED OIL FINAL DESTINATION					
6	Regeneration/ re-refining		0	0	0
7	Combustion (burning)		0	0	0
8	Other uses recycled		0	0	0
9	Total recovered	6+7+8	0	0	0

EFFICIENCY RATIOS AND COMPLIANCE OBJECTIVES		FORMULA	PROPOSED OBJECTIVES	CURRENT RATIOS		
				2013	2014	2015
E1	**Collection rate**	**E1=5/4**	**95%**	**0**	**0**	**0**
E2	Regeneration/ re-refining	E2=6/5	100%	0	0	0
E3	Combustion rate	E3=7/5	0	0	0	0
E4	Other uses recycled rate	E4=8/5	0	0	0	0
E5	**Total recovered rate**	**E5=9/5**	**100**	**0**	**0**	**0**

2. Chapters of guide

Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 6. Initiate used oil collection logistics

In order to establish collection logistics of used oil, several issues should be previously organized:

List of producers: a list of used oil producers should be identified with ID Code

Territorial organization: national or regional level?

2. Chapters of guide

Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 6. Initiate used oil collection logistics (cont.)

Producer: Producers should have **drums to store used oil** with identification label, be required to **deliver used oil to an authorized hazardous waste management company, inform the public administration** (Hazardous waste producing statement) and **maintain official registration docs.**

A. INFORMACIÓN COMÚN SOBRE LOS AGENTES ECONÓMICOS:
EMPRESA y NIF:
CENTRO/ESTABLECIMIENTO y NUMERO DE REGISTRO DE ESTABLECIMIENTOS INDUSTRIALES:
DIRECCIÓN/ POBLACIÓN/ C.P./ PROVINCIA/ COMUNIDAD AUTÓNOMA (C.A)

B. INFORMACIÓN ESPECÍFICA SOBRE LOS FABRICANTES DE ACEITES INDUSTRIALES:
ES FABRICANTE ☐
ES IMPORTADOR O ADQUIRENTE INTRACOMUNITARIO ☐

CANTIDADES (Kg) / TIPO DE ACEITE	AUTOMOCIÓN	DE USO INDUSTRIAL	OTROS
Puestas en el mercado de la C.A.			

C. INFORMACIÓN ESPECÍFICA SOBRE LOS GESTORES DE ACEITES USADOS:
COMUNIDAD AUTÓNOMA DE _____ AÑO: _____

C.1. ACEITE INDUSTRIAL USADO GESTIONADO EN TODAS SUS FASES EN ESTA COMUNIDAD AUTÓNOMA.

Tipo de gestión realizada			Cantidad (Kg)
Operación:		Tratamiento (*)	
Gestión externa	Regeneración		
	Reciclado		
	Valorización energética		
	Otros		
Gestión interna	Regeneración		
	Reciclado		
	Valorización energética		
	Otros		

(*) Tratamiento: Análisis (A)
Tratamiento previo (TP)
Tratamiento secundario (TS)
Otros (O)

C.2. ACEITE INDUSTRIAL USADO NO GESTIONADO EN TODAS SUS FASES DENTRO DEL ÁMBITO TERRITORIAL DE ESTA COMUNIDAD AUTÓNOMA.

	OPERACIONES REALIZADAS EN ESTA COMUNIDAD AUTÓNOMA	COMUNIDAD AUTÓNOMA DE DESTINO	CANTIDAD (Kg.)
ACEITE USADO RECOGIDO EN ESTA COMUNIDAD AUTÓNOMA Y GESTIONADO EN OTRA DISTINTA			

	OPERACIONES REALIZADAS EN ESTA COMUNIDAD AUTÓNOMA	COMUNIDAD AUTÓNOMA DE ORIGEN	CANTIDAD (Kg.)
ACEITE USADO RECOGIDO EN OTRA COMUNIDAD AUTÓNOMA Y GESTIONADO EN ESTA			

2. Chapters of guide

Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 6. Initiate used oil collection logistics (cont.)

Transport for oil collection: implemented by **trucks of 4 to 12 t. useful load** with **pump** while filling-out the **official collecting form**.

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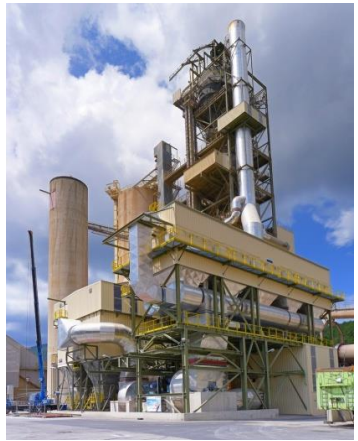
Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 6. Initiate used oil collection logistics (cont.)

Transfer centers: A transfer center is the facility for used oil **reception, analysis, classification and temporary storage** of collected used oil in a territorial area of work. Transfer centers receive the collected used oil **within a radius of 150 km** and **once analyzed and classified**, it is **sent to authorized end-use plants** either in the country or abroad.



2. Chapters of guide

Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 6. Initiate used oil collection logistics (cont.)

Collection business model:

- **public, private or a public-private** partnership.
- organized and authorized to **one or several collectors** if the collection is regional.

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 6. Initiate used oil collection logistics (cont.)

Collection business model:

If the collection of used oil is awarded by a **public tender to a collector by region for a certain time** (5 years for example), it will **ensure greater control** of producers and transporters as well as better **compliance with environmental objectives**.

Also, the reception of waste oil in transfer centers from **small collectors** should be promoted to ensure **high collection rates** and proper management.

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 6. Initiate used oil collection logistics (cont.)

Existence of uncontrolled collectors

In the case, there are small collectors of used oil present who are not controlled; this is usually due to the existence of a network of **potential consumers which replace fuel by used oil for economic reasons**.

Another problem in this circumstance is that the used oil collection **service is not guaranteed to all producers**, **only** to **large producers**. In addition, the fall in the price of fuel can prevent the collection of used oil as it becomes non-economically profitable.

The **final destination of used oil should be controlled** to prevent the delivery by producers (workshops and industries) to unauthorized collectors.

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 7. Establish used oil transfer centers

The objective should be implementing **regional transfer centres to receive, analyze and store the oil collected from small collectors**. In the case of **large collectors**, they **should have their own transfer centres**.

Transfer centers should cover used oil collection within a **radius of 150 km**.

The final use of the used oil should be in accordance with the **established ecological objectives** percentage:

% regeneration;

% pre-treatment and used as fuel in authorized plants; and

% burned on cement or similar facilities.

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 7. Establish used oil transfer centers (cont.)

A transfer center should have **laboratory equipment** to analyze received used oil and then sent it to final destination. This used oil analysis should include:

Chlorine levels;

PCBs;

Water; and

Sediments.

2. Chapters of guide

Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 8. Establish regeneration/re-refining plants of used oil

This process should be **based on the Best Available Techniques (BAT)** for the re-refining of used oil.

Based on regeneration objectives, regeneration plants should have the following units:

Dewatering unit for water and sludge treatment.

Distillation unit to treat different viscosities of oil bases.

Elimination of asphalt and metals through the distillation unit or by treatment with propane.

Final treatment unit for the removal of contaminants, through a chemical and hydrogenation process, removing any residual oxidation product such as chlorates and sulphates.

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Chapter 3. Proposed steps to the Environmentally Sound Management (ESM) of used oils

Step 8. Establish regeneration/re-refining plants of used oil

In regards to establishing a regeneration plant to make it economically feasible, **the government should guarantee an annual collection of 15.000 to 20.000 tons of used oils at a reasonable used oil price**.

Discussion / questions / ideas / proposals

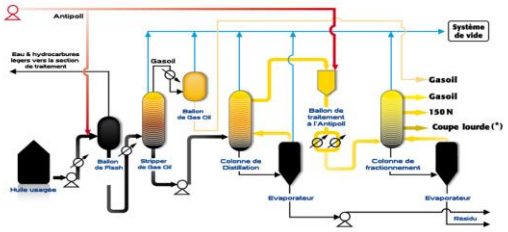
2. Chapters of guide

Chapter 4. Pollution prevention case studies

4.1. Extended Producer Responsibility for used oils: SIGAUS (Integrated Management System of Used Oils), Spain.

4.2. 100% regeneration: the Catalan Used Oil Treatment Company (CATOR, S.A.), Spain.

4.3 Used lubricant oil management: Eco-Zit, Tunisia.



Discussion / questions / ideas / proposals

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Annexes

A1. Bibliography

A2. List of acronyms

A3. EuropaLub lubricant classification

Table showing the EuropaLub (www.europalub.org) lubricant classification and coding.

Discussion / questions / ideas / proposals

Horizon 2020

Strategic Partnership for the Mediterranean Sea Large Marine Ecosystem

MedPartnership

Together for the Mediterranean Sea

GEF UNEP

Thank you for your attention

Don’t waste oil time, take action!

UNEP MAP

Regional Activity Centre for Sustainable Consumption and Production

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