

**«Support to Member States in improving hazardous waste management based on assessment of Member States' performance.»**



MINISTERO DELL'AMBIENTE  
E DELLA TUTELA DEL TERRITORIO E DEL MARE



European  
Commission

## **Seminar on hazardous waste and PCB management**

*“Status of the PCB management in Italy –  
Current challenges and good practices”*

*Giulia Sagnotti*

*Unità Assistenza Tecnica Sogesid S.p.A. presso il Ministero dell'Ambiente e della  
Tutela del Territorio e del Mare - Direzione Generale per i Rifiuti e l'Inquinamento*

**Italy / 15th of September 2017 / Rome**  
**Ministry of Environment, Via Cristoforo Colombo, 44, Rome**

# Legislative framework

---

- **DPR 24 may 1988 n. 216 (Implementation of 85/467/CEE directive)**
- **D. Lgs. 22 may 1999 n. 209 (implementation of the 96/59/CE directive)**
- **DM 11 october 2001 (requirements for the use of transformer containing PCB pending their decontamination and disposal)**
- **Law 18 april 2005 n.62 art. 18 (deadline for disposal)**

# DPR 24 may 1988 n. 216 (Implementation of 85/467/CEE directive)

---

- **Article 1. Scope. Restriction to the put on the market and use of PCB and plants, equipment and fluids containing PCB listed in the Annex**
- **Article 4.**
  - **restriction to the put on the market and use of substances and preparation in annex 1 point 1.**
  - **Requirements for derogation for the use of plants, equipment and fluids of Annex 1 point 2**
- **Article 5. Inventory. Establishment of the regional inventories.**
- **Article 7. controls and inspections.**

## D. lgs. 22 may 1999 n. 209 (implementation of the 96/59/CE directive)

- Article 1. Scope. Disposal of used PCB and decontamination and disposal of PCB and equipment containing PCB
- Article 2. definitions
- Article 3. inventory. PCB holders notify (every 2 years since 1999) to the regional offices of the “catasto dei rifiuti” on the equipment with PCB volume  $>5 \text{ dm}^3$ . The last ones notify the information to APAT (now ISPRA)
- Article 4. Plans. PCB plans are part of the regional waste management plans
  - Regions adopt and send to the MATTM a decontamination and disposal plan for the equipment of the inventory and
  - a plan for the collection and disposal of equipment with PCB volume  $< 5\text{dm}^3$ .
- Article 5. obligations
- Article 6. labelling

# Secondary Legislative dispositions

- **D.M. 11 febbraio 1989 “Modalità per l'attuazione del censimento dei dati e per la presentazione delle denunce delle apparecchiature contenenti fluidi isolanti a base di PCB”.**
- **D.M. 17 gennaio 1992 “Modalità di etichettatura degli apparecchi e impianti contenenti policlorobifenili (PCB) e policlorotrifenili (PCT)”.**
- **D.Lgs. 27 gennaio 1992, n. 95 “Attuazione delle direttive 75/439/CEE e 87/101/CEE, relative alla eliminazioni degli oli usati”. Recepisce le direttive 75/439/CEE e 87/101/CEE relative alla eliminazione degli oli usati. Vieta la combustione degli oli usati contenenti PCB in concentrazione >25ppm**
- **D.M. 16 febbraio 1993. Recepisce le direttive 90/517/CEE, 91/325/CEE e 91/326/CEE di modifica della direttiva 67/548/CEE relativa alla classificazione, all'imballaggio e all'etichettatura delle sostanze pericolose.**

# Secondary Legislative dispositions

- D.M. 29 luglio 1994 *“Attuazione delle direttive CEE numeri 89/677, 91/173, 91/338 e 91/339 recanti, rispettivamente, l'ottava, la nona, la decima e l'undicesima modifica della direttiva CEE n. 76/769 per il ravvicinamento delle disposizioni legislative, regolamentari ed amministrative degli Stati membri relative alle restrizioni in materia di immissione sul mercato e di uso di talune sostanze e preparati pericolosi, ai sensi dell'art. 27 della legge 22 febbraio 1994, n.146.”* Recepisce le direttive 89/677/CEE, 31/338/CEE e 91/339/CEE di modifica della direttiva 76/769/CEE. Modifica il D.P.R. n.216/1988, portando la percentuale in PCB, oltre la quale sono vietati l'immissione in commercio e l'uso, allo 0,005% in peso.
- D.M. 5 settembre 1994 *“Elenco delle industrie insalubri di cui all'art. 216 del testo unico delle leggi sanitarie”*. Riporta l'elenco delle industrie insalubri, tra cui sono comprese quelle coinvolte nella produzione, impiego, deposito di PCB/PCT.

# Responsibilities for the management of PCB

<b>Issue</b>	<b>Authority</b>	<b>Transmission</b>
<b>PCB Plans</b>	Regions and autonomous Provinces	MATTM
<b>Inventory</b>	Regional section of Catasto rifiuti	ISPRA
<b>Controls and inspections</b>	Regions and Provinces	

---

## PCB Plans - State of play

- PCB Plans are drawn up by the Regions
- The first deadline for the drawing of the PCB plans was year 2003.
- PCB plans are updated together with the Waste Management Plans (since are part of it) every 6 years.



# PCB Plans - State of play

Region	Last update	note
<b>Abruzzo</b>	2014	Chapter 16 of WMP
<b>Valle d'Aosta</b>	2015	Chapter of WMP
<b>Puglia</b>	2013	Chapter 9 of WMP
<b>Basilicata</b>	2016	Chapter 2 of sec. 4 WMP
<b>Calabria</b>	2016	Chapter of the WMP
<b>Campania</b>	2011	Chapter of the WMP
<b>Emilia Romagna</b>	2016	Chapter 18 of the WMP
<b>Friuli V. G.</b>	2005	New IWMP of 2016. PCB annex in preparation. Update no needed target almost achieved (2 missing)
<b>Lazio</b>	2012	Chapter of the WMP
<b>Liguria</b>	2015	Chapter of the WMP



# PCB Plans - State of play

Region	Last update	note
Lombardia	2014	Chapter 17 of WMP
Molise	2004	Update no necessary. Target achieved
Piemonte	2016	Chapter 4 of WMP
Sardegna	2002	Update no necessary. Target achieved
Sicilia	2004	Update no necessary. Target achieved
Marche	2015	Chapter 10 of WMP
Trento	2004	Update no necessary. Target achieved
Bolzano	2004	Update no necessary. Target achieved
Toscana	2014	Chapter of the WMP
Umbria	2009	Chapter 10 of the WMP
Veneto	2015	Chapter of the WMP



# Inventory - State of play

<b>INVENTORY PCB 2016</b>		
<b>REGION</b>	<b>total number of appliance in use with concentration between 50 e 500 mg/kg (included ENEL)</b>	<b>Number of appliance with concentration higher than 500 mg/kg</b>
Piemonte	924	61
Valle d'Aosta	13	0
Lombardia	232	25
Trento	4	0
Bolzano	12	0
Veneto	154	3
Friuli V.G.	64	2
Liguria	293	4
Emilia Romagna	375	42
Toscana	101	0
Umbria	94	0
Marche	53	3
Lazio	499	0
Abruzzo	192	4
Molise	0	0
Campania	1089	47
Puglia	132	3
Basilicata	66	0
Calabria	195	0
Sicilia	841	0
Sardegna	183	0
<b>TOTALE</b>	<b>5516</b>	<b>194</b>

**Seminar on hazardous waste and PCB management  
Italy / 15th of September 2017 / Rome**

# Inventory - State of play

<b>INVENTORY PCB 2014</b>		
<b>REGION</b>	<b>total number of appliance in use with concentration between 50 e 500 mg/kg (included ENEL)</b>	<b>Number of appliance with concentration higher than 500 mg/kg</b>
<b>Piemonte</b>	1151	61
<b>Valle d'Aosta</b>	13	0
<b>Lombardia</b>	247	49
<b>Trento</b>	5	0
<b>Bolzano</b>	12	0
<b>Veneto</b>	166	3
<b>Friuli V.G.</b>	70	2
<b>Liguria</b>	547	5
<b>Emilia Romagna</b>	372	133
<b>Toscana</b>	337	0
<b>Umbria</b>	263	9
<b>Marche</b>	70	0
<b>Lazio</b>	642	0
<b>Abruzzo</b>	259	4
<b>Molise</b>	62	0
<b>Campania</b>	1144	47
<b>Puglia</b>	227	3
<b>Basilicata</b>	48	5
<b>Calabria</b>	284	0
<b>Sicilia</b>	1571	0
<b>Sardegna</b>	182	0
<b>TOTALE</b>	<b>7672</b>	<b>321</b>

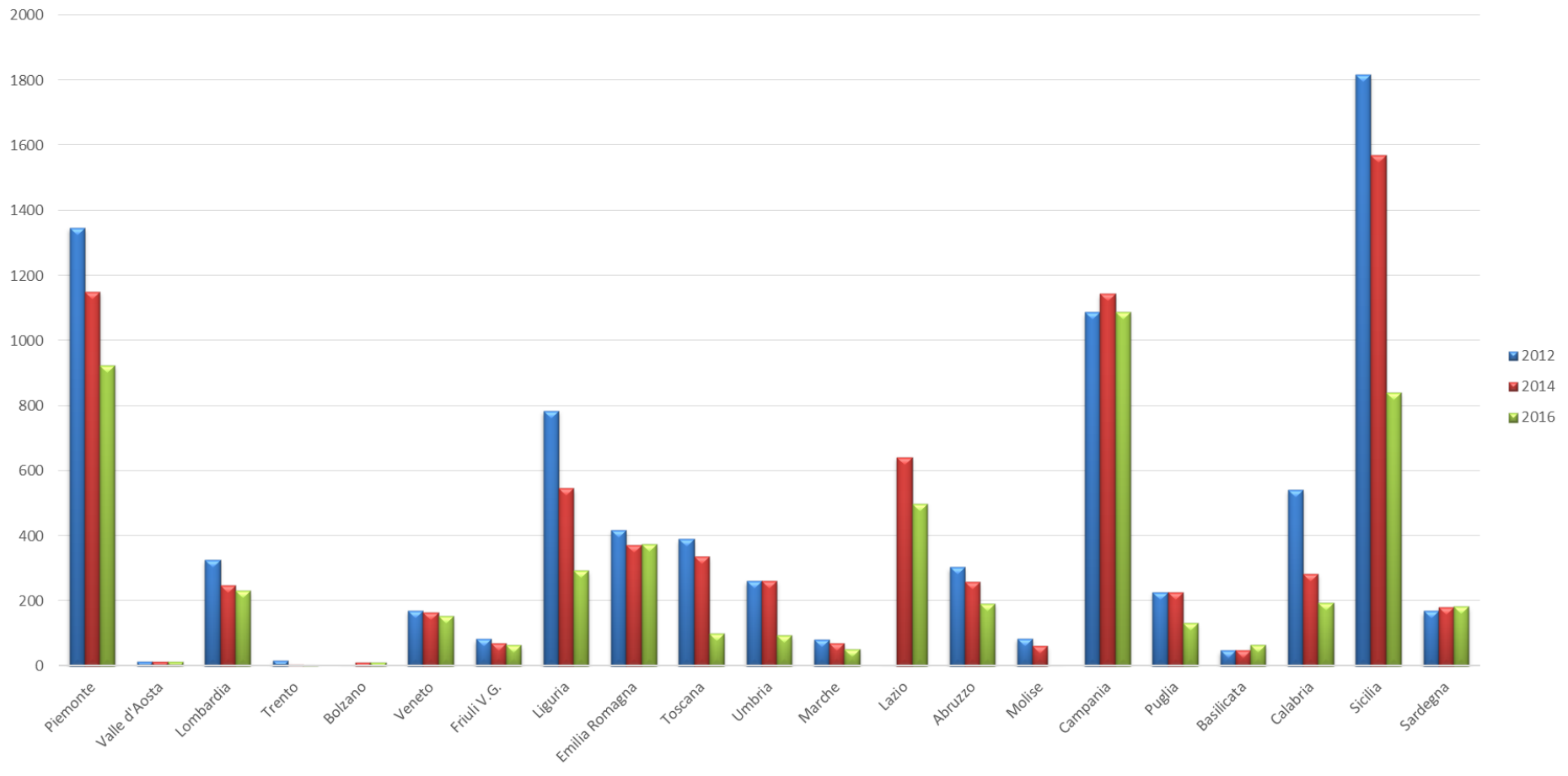
**Seminar on hazardous waste and PCB management  
Italy / 15th of September 2017 / Rome**

# Inventory - State of play

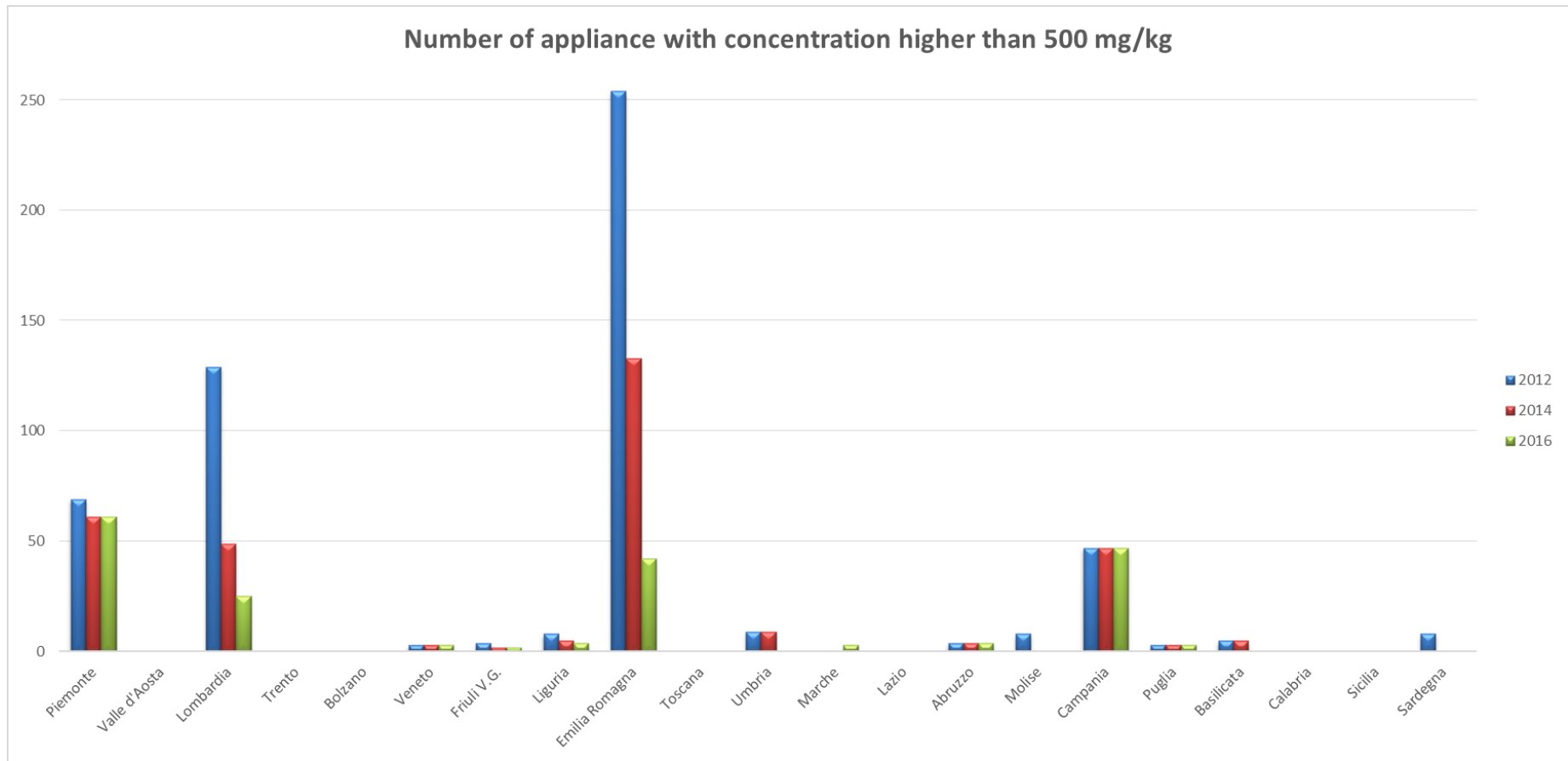
<b>INVENTORY PCB 2012</b>		
<b>REGION</b>	<b>total number of appliance in use with concentration between 50 e 500 mg/kg (included ENEL)</b>	<b>Number of appliance with concentration higher than 500 mg/kg</b>
<b>Piemonte</b>	1347	69
<b>Valle d'Aosta</b>	14	0
<b>Lombardia</b>	327	129
<b>Trento</b>	18	0
<b>Bolzano</b>	n.d.	n.d.
<b>Veneto</b>	171	3
<b>Friuli V.G.</b>	83	4
<b>Liguria</b>	784	8
<b>Emilia Romagna</b>	418	254
<b>Toscana</b>	390	
<b>Umbria</b>	263	9
<b>Marche</b>	82	0
<b>Lazio</b>	n.d.	n.d.
<b>Abruzzo</b>	304	4
<b>Molise</b>	85	8
<b>Campania</b>	1.087	47
<b>Puglia</b>	227	3
<b>Basilicata</b>	48	5
<b>Calabria</b>	543	0
<b>Sicilia</b>	1817	0
<b>Sardegna</b>	170	8
<b>TOTALE</b>	<b>8178</b>	<b>551</b>

# Inventory

total number of appliance in use with concentration between 50 e 500 mg/kg (included ENEL)



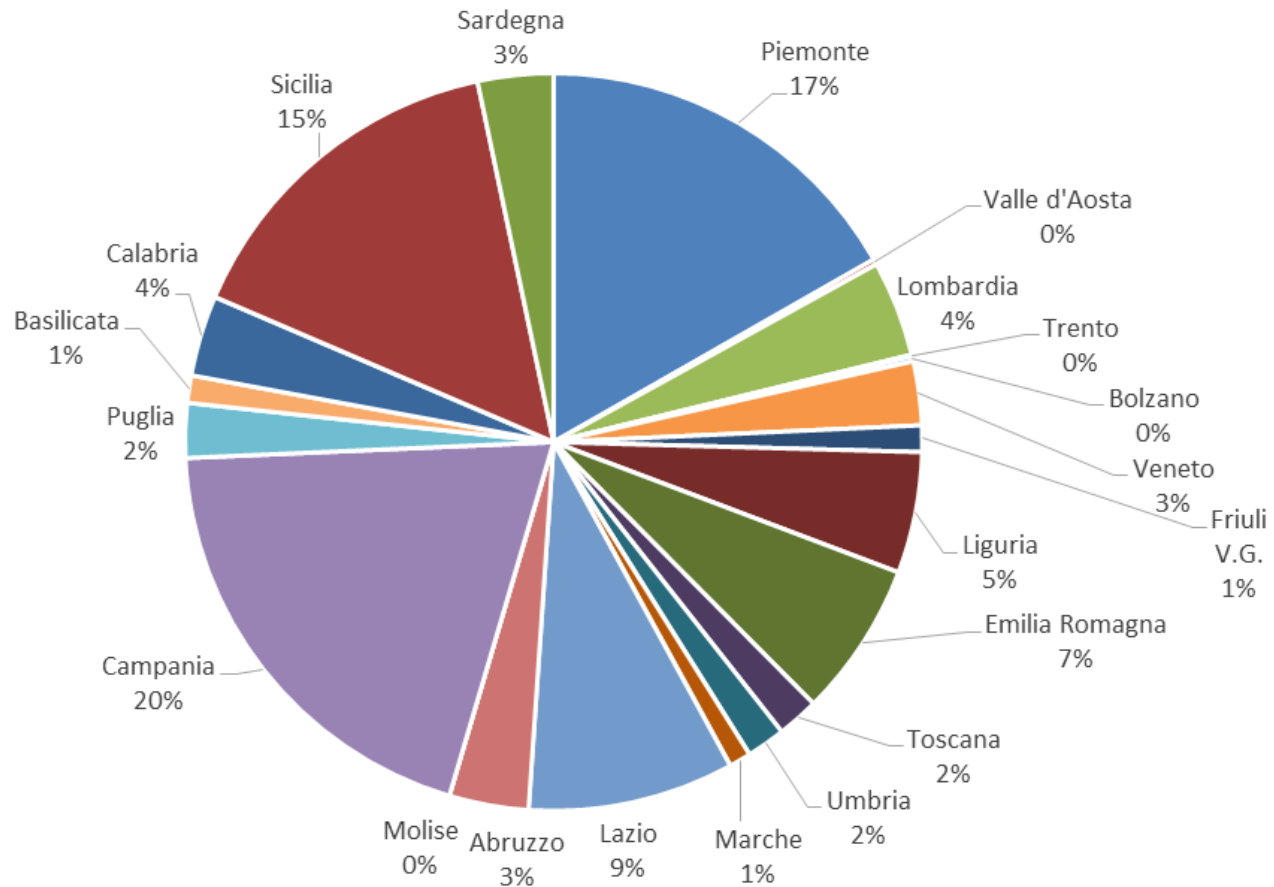
# Inventory



**Seminar on hazardous waste and PCB management  
Italy / 15th of September 2017 / Rome**

# Inventory

% by Region of appliance in use with concentration between 50 e 500 mg/kg (included ENEL) - year 2016 -

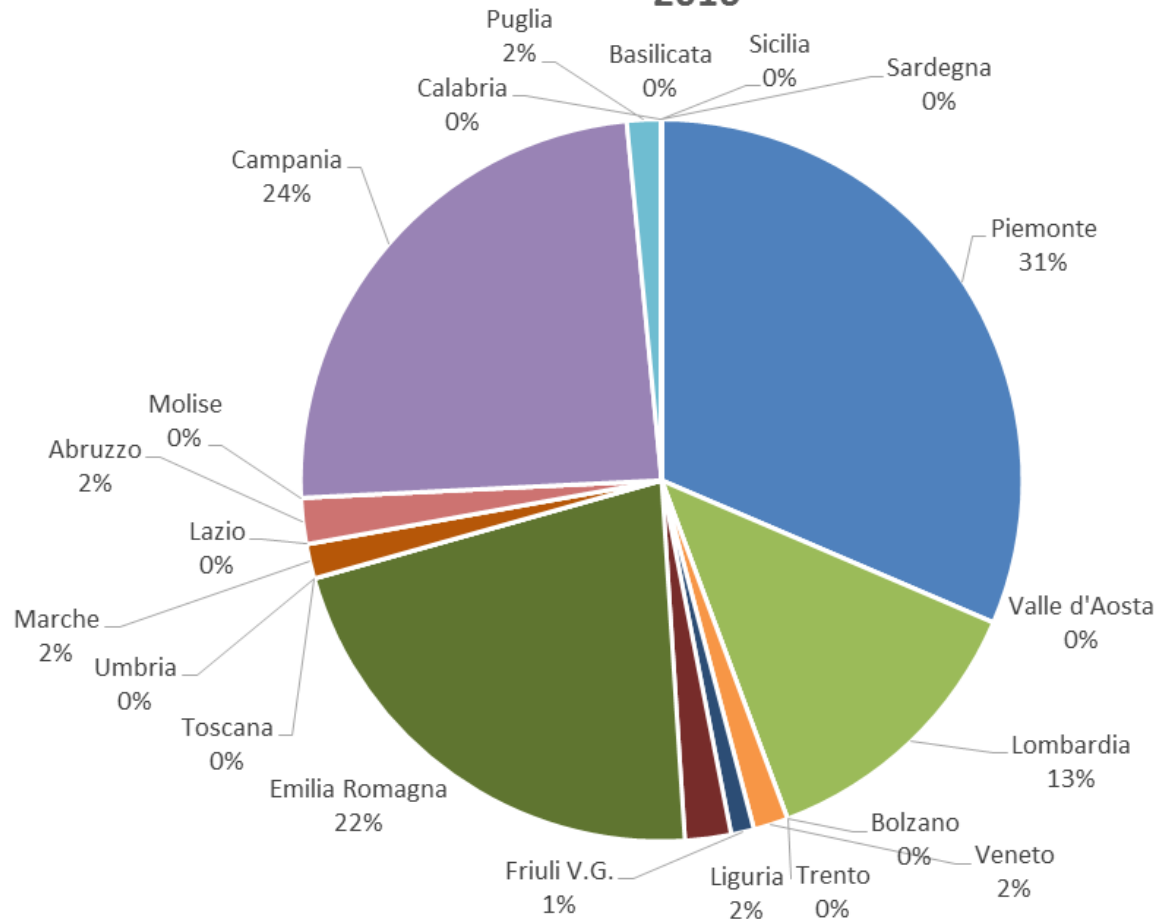


**Seminar on hazardous waste and PCB management  
Italy / 15th of September 2017 / Rome**



# Inventory

% by Region of appliance with concentration higher than 500 mg/kg - year  
2016 -



**Seminar on hazardous waste and PCB management  
Italy / 15th of September 2017 / Rome**

# Inventory



## Rapporto Rifiuti Speciali

Edizione 2017

imballaggi

smaltimento

ciclaggio

recupero di materia

rec

recupero

risorse

disca

recupero ener

riciclaggio

trattamento

incenerimento

recupe

risorse

dis

recupero



RAPPORTI

The last PCB inventory is available in internet..

In the RAPPORTO RIFIUTI SPECIALI 2017

Prepared by ISPRA

## CHAPTER 4

<http://www.isprambiente.gov.it/it/pubblicazioni/rapporti/rapporto-rifiuti-speciali-edizione-2017>

264/2017

# Best practice: national BAT

Supplemento ordinario alla "Gazzetta Ufficiale", n. 130 del 7 giugno 2007 - Serie generale

Spediz. abb. post. 45% - art. 2, comma 20/b  
Legge 23-12-1996, n. 662 - Filiale di Roma



PARTE PRIMA

Roma - Giovedì, 7 giugno 2007

SI PUBBLICA TUTTI  
I GIORNI NON FESTIVI

DIREZIONE E REDAZIONE PRESSO IL MINISTERO DELLA GIUSTIZIA - UFFICIO PUBBLICAZIONE LEGGI E DECRETI - VIA ARENULA 70 - 00186 ROMA  
AMMINISTRAZIONE PRESSO L'ISTITUTO POLIGRAFICO E ZECCA DELLO STATO - LIBRERIA DELLO STATO - PIAZZA G. VERDI 10 - 00186 ROMA - CENTRALINO 06 85081

N. 133

## MINISTERO DELL'AMBIENTE E DELLA TUTELA DEL TERRITORIO E DEL MARE

DECRETO 29 gennaio 2007.

**Emanazione di linee guida per l'individuazione e l'utilizzazione delle migliori tecniche disponibili in materia di gestione dei rifiuti, per le attività elencate nell'allegato I del decreto legislativo 18 febbraio 2005, n. 59.**

# Best practice: national BAT

---

**Guidelines providing the criteria for the identification and utilisation of the best available techniques ref. section 3 paragraph 2 of legislative decree 372/99”**

**Guidelines relative to existing systems for the activities within the IPPC categories:**

## ***5 WASTE MANAGEMENT***

***(Treatment of PCBs, apparatuses and wastes containing PCBs and stocking systems)***

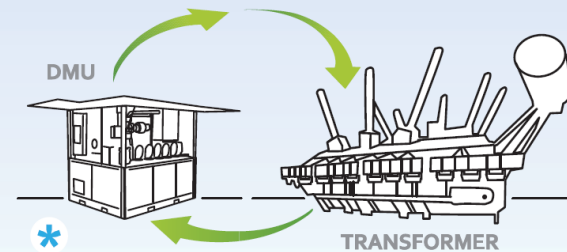
# best practices

## CDP PROCESS®

### THE BEST AVAILABLE TECHNIQUE (BAT/BEP) FOR THE DECONTAMINATION FROM PCBs

When equipment in operation with insulating oils contaminated by PCBs is present, Sea Marconi developed and patented CDP Process®, an integrated solution using DMU units, dehalogenation/detoxification reagents (S/CDP®) and operational procedures capable of re-classifying “NO-PCBs” fluid and equipment and, at the same time, restoring the optimised conditions in compliance with norms IEC 60422 Ed. 4 - 2012 art. 12.4-4; CENELECPR 50503-2010 art. 8.4.2.3; CIGRE 413-2010 art. 10.1.4. Sea Marconi has been a pioneer in this field, since the first version of CDP Process® for the decontamination of transformers and the dehalogenation/decontamination of PCBs/POPs in insulating oils of transformers was developed already in 1982. CDP Process® prevents the operational criticalities of the change of the oil, which would be, in any case, contaminated by the PCBs present in the residual oil impregnating the papers; our solution eliminates the costs and the complicated administrative procedures for the collection, transportation and disposal of PCBs wastes with authorised operators. CDP Process® has unique features, ensuring concentrations of PCBs complying with the limits

prescribed by local regulations or internal specifications: PCB < 50; < 25; < 10; < 2 mg/Kg, with a warranty of 90 days. The intervention is carried out on-site, in continuous mode, closed-loop, without draining even partially the transformer, with the possibility of On-load intervention. The CDP Process® operates safely, at low temperatures (80-100 °C) and does not present risks of explosion and/or fires. The CDP Process® is classified as **Best Available Technique (BAT)** for the decontamination of PCBs both for transformers in operation and at end of life (Italian Ministry of Environment, D.M. 29/01/2007 - G.U. no. 133 of 7/06/2007 art. D.2.2.2.3 and art. E.3). The international references allowed Sea Marconi to obtain several tenders issued by international organisations on strategic electric networks in Developing Countries. CDP Process® increases the value of functional resources in operation, without disposing of PCBs, resulting as the best solution also in terms of CO<sub>2</sub> equivalent (5 Kg of di CO<sub>2</sub> saved for each kg of oil not incinerated), besides satisfying the requisites of the European Directives in terms of proximity, self-sufficiency and functional recovery.



### DMU and Procedures of intervention

THE EXTRAORDINARY RESULTS OF THE INTERVENTIONS BY SEA MARCONI ARE THE PRODUCTS OF THE EXPERIENCE MATURED SINCE 1968, THE USE OF MULTI-FUNCTION DECONTAMINATION MOBILE UNITS (DMU) “DESIGNED AND MADE INTERNALLY” AND THE FORMULATION OF SPECIFIC REAGENTS (S/CDP® AND S/CHED® ETC.) USED ON THE BASIS OF DIFFERENT OPERATIONAL SCENARIOS.

	SOLUTION	PHYSICAL DECONTAMINATION CHEDCOS®	DEPOLARISATION CHEDCOS®	DEHALOGENATION CDP PROCESS®
CRITICALITY	H <sub>2</sub> O, gases, particles	•	•	•
	Acidity, tg delta, colour		•	•
	DBDS <sup>1</sup> , corrosive sulfur <sup>2</sup>		•	•
	Dissolved metals <sup>3</sup>		•	•
	PCBs-PCTs-PCBTs-POPs			•

<sup>1</sup>Corrosive Sulfur from DBDS; <sup>2</sup>Corrosive Sulfur NO DBDS; <sup>3</sup>Metal corrosion NO Corrosive Sulfur

THE DMUS ARE CONNECTED TO THE TRANSFORMER BY HOSES, THE INSULATING FLUIDS CIRCULATES THROUGH THE DMUS WHERE IT IS HEATED, DEGASSED, DEHUMIDIFIED FILTERED, DECONTAMINATED AND THEN RETURNS INTO THE TRANSFORMER, WHICH IS NEVER DRAINED, EVEN PARTIALLY. THE CONTINUOUS CIRCULATION OF THE INSULATING LIQUID CREATES A CONSTANT FLOW OF LIQUID IN THE TRANSFORMER FAVOURING THE ELIMINATION OF DEPOSITS (SLUDGE) ON THE PAPERS AND IN THE TANK. THE ACTIVITIES ARE CARRIED OUT UNDER **SAFE** CONDITIONS THANKS TO THE LOW OPERATIONAL TEMPERATURES, THE USE OF PATENTED REAGENTS THAT DO NOT CREATE DANGERS FOR EXPLOSIONS OR FIRE, THE USE OF SPECIAL PIPES (SPILLGUARD®) CAPABLE OF CUTTING OFF THE PROCESS IN CASE OF ACCIDENTAL SPILLS AND ALSO THANKS TO A CONTROL SYSTEM SOFTWARE CAPABLE OF VERIFYING AT ANY GIVEN TIME THAT THE PROCESS PROCEEDS UNDER SAFE CONDITIONS AND UNDER QUALITY CONTROL RULES, 24/24, EVEN WHEN WORKING UNMANNED. THE INTERVENTIONS ARE CARRIED OUT WITH THE **ON-LOAD** OPTION KEEPING THE **TRANSFORMER IN OPERATION, ENERGISED AND LOADED** (INTERNATIONAL EXPERIENCES ALSO IN NUCLEAR POWER PLANTS AND ON TRANSFORMERS UP TO 780 MVA AND UP TO 500 KV). THE CLOSED CIRCUIT INTERVENTIONS BY SEA MARCONI OFFER THE ADVANTAGE OF PREVENTING THE CRITICALITIES DUE TO THE **CHANGE OF THE OIL INVOLVING** THE DECOMMISSIONING OF THE EQUIPMENT AND THE FUNCTIONAL RISKS (E.G. ELECTRIC DISCHARGES) FOR AIR BUBBLES AND ATMOSPHERIC MOISTURE.

# Criticalities in the decontamination of PCB:

## achievement of 2010 target

- **Management Problems (impossible to stop the production)**
  - **Economic problems: small industries face difficulties in affording the cost for the decontamination**
- **Bankruptcy of the operator. Factory is not operating anymore. Activity is close or abandoned.**
  - **New discovery of PCB**
- **Classification mistake: some equipments have been considered as transformers and subject to derogation**

# Challenges in PCB management

---

- **Remediation of the contaminated sites**
  - **Incineration capacity**



MINISTERO DELL'AMBIENTE  
E DELLA TUTELA DEL TERRITORIO E DEL MARE

DIREZIONE GENERALE PER I RIFIUTI E L'INQUINAMENTO  
UNITÀ ASSISTENZA TECNICA SOGESID S.P.A.

**contatti:**

[sagnotti.giulia@minambiente.it](mailto:sagnotti.giulia@minambiente.it)