



***Integral Management of
Hazardous Chemical Substances***

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Final Seminar
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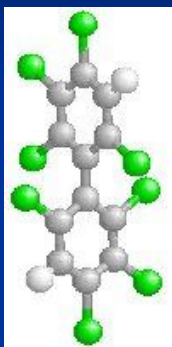
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Importance of the component

- Implementation of Article 6 of Stockholm Convention pertaining to Persistent Organic pollutants and countermeasures taken to reduce the release of stockpiles and waste or destroy them.
- Set up appropriate strategies.
- Work practically as much as possible to limit Persistent Organic pollutants's stockpiling
- Safe and sound stock management.

Target Substances (1)

Polychlorinated Byphenils (PCBs)



- Mixture of 209 derivatives of organic chlorinated compounds.
- Resistant to chemical, photic and biological lysis.
- Colorless or yellow light or waxy oil substances.
- Anti-inflammatory with special hydrolic and thermal properties.
- Mid-life period ranges between months to several years.
- Volatile and diffused in the air across thousands of miles.
- Low concentrations are highly toxic.
- Insufficiently water soluble and easily soluble in greases and fats.
- Stacked in lipoid tissues of sea and land living creatures.
- Easily absorbed in food, namely vegetables, fruits and dairy products.
- A species of the dirty dozen of Persistent Organic pollutants.

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Sources of Polychlorinated Byphenils (PCBs)



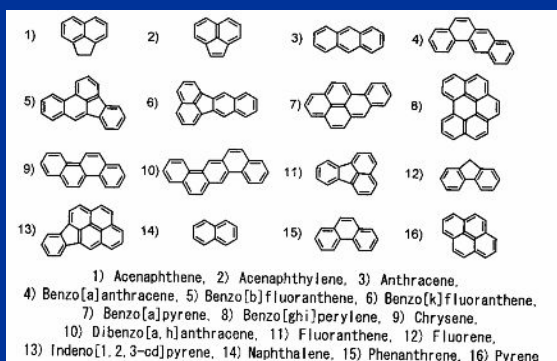
- Some painting substances.
- Some adhesive substances.
- Some inks.
- Some insulating substances.
- Some capacitors and transformers.
- Leaks from old transformers, engines and insulators.
- Emissions of some industries' chimneys.
- Emissions of asphalt corrosion.
- Burning locations of substances containing PVC or PCB's.
- Old hydrolic oils.
- Chlorinated pesticides.

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Target Substances (2)

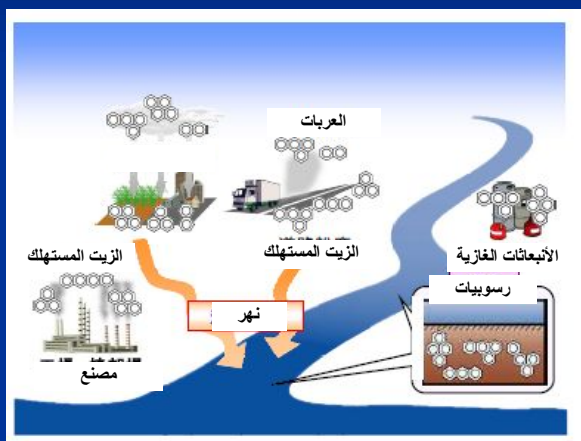
Polycyclic Aromatic Hydrocarbons (PAHs)

- PAHs are organic compounds which include only carbon and hydrogen with a structure of fused rings, contain at least two fused benzene rings .
- The USEPA priority pollutants have chosen 16 PAHs.
- Metabolites of some HMW PAHs such as benz[a]anthracene, chrysene, benzo[b,k] fluoranthene, and benzo[a]pyrene were reported to be mutagenic and carcinogenic in fish, mammals and humans .



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Sources of Polycyclic Aromatic Hydrocarbons (PAHs)



- PAHs generated during combustion, are formed during burning of coal, oil and gas, garbage, or other organic substances, especially under incomplete burning condition.

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Target Substances (3) Heavy Metals

Chromium (Cr)

- Chromium causes cholera morbus, dermatitis, canker, and lung cancer.
- Chromium is discharged from metal plating, tanning, and dyeing industry.

Cadmium (Cd)

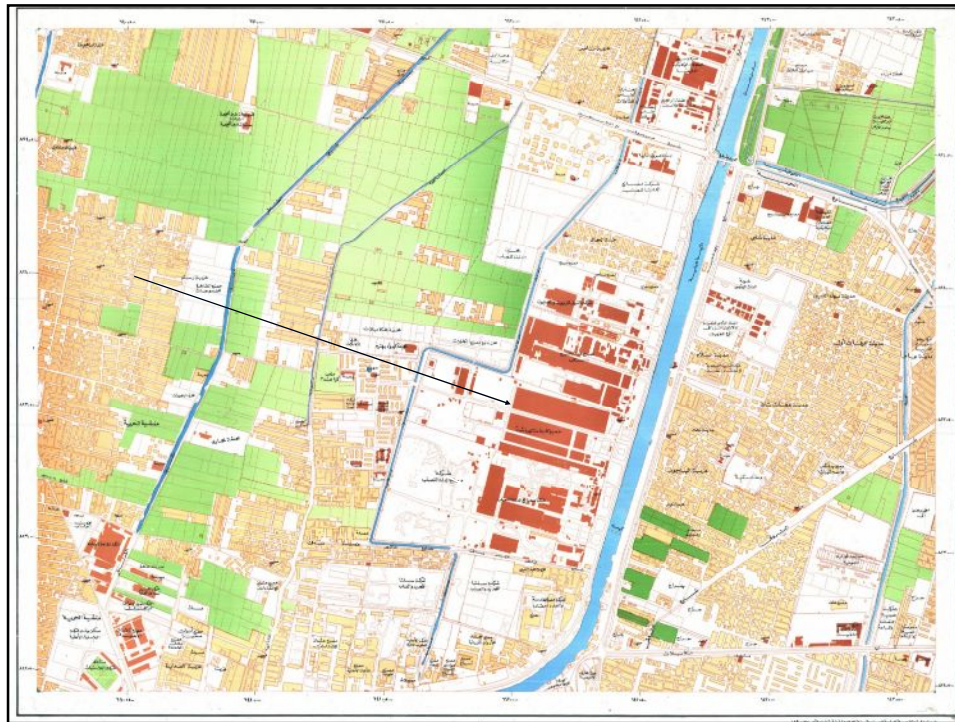
- Cadmium affects kidney's function, and causes osteomalacia.
- Cadmium is discharged from metal plating, metal manufacturing, and battery producing industry.

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Properties of the area object of the research Kaliubeya governorate

- Kaliubeya is one of the Greater Cairo region governorates; at the Eastern side of the Nile, at the Delta cape. To the South: Cairo and Giza governorates; to the North: Dakahleya and Gharbeya governorates; to the West: Menufeya governorate.
- The governorate's total area: 1124.28 km².
- No. of factories: 1450; No. of workshops: 1723.

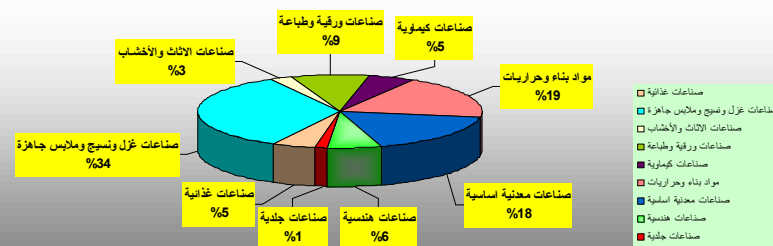
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Industrial Sector

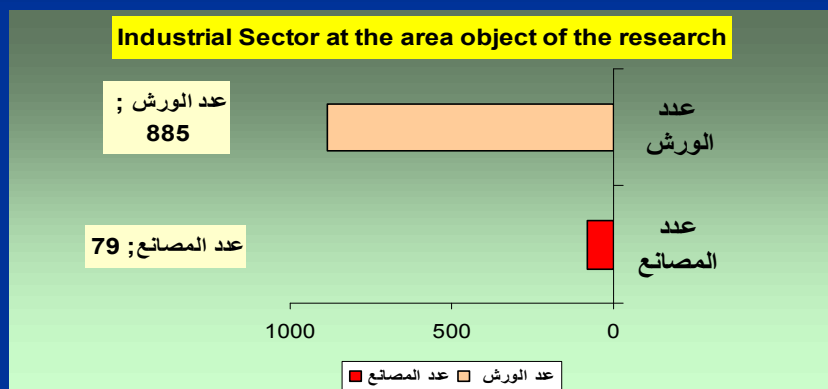
Total	Food industries	Leather industries	Furniture and wood industries	Engineering industries	Building materials and thermals	Paper industries and printing	Spinning, weaving and ready-made garments	Chemical industries	Primary mineral industries
79	4	1	3	5	15	7	27	4	14

Industrial Sector - East District - Shubra El Kheima



Industrial Sector

1. No. of factories: 79
2. No. of workshops: 885



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Step of CC1 Activities on PCBs, PAHs and HM

Step 1 : Preliminary Work

Step 2: Questionnaire Survey

Step 3: Monitoring Activity

Step 4: Database Formulation

Step 5: Reporting, Seminar



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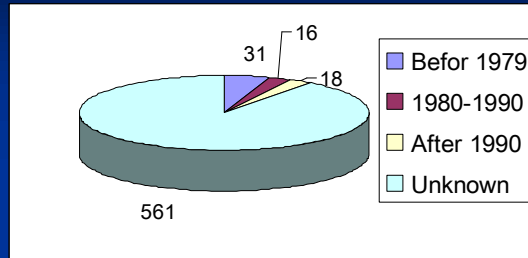


No of Transformers and Amount of Oils Found

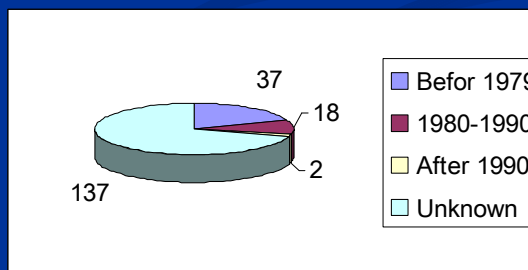
Type of Facility	Before 1979		1980-1990		After 1991		Unknown		Sub-total	
	Number of Transformer	Amount of Oil (kg)	Number of Transformer	Amount of Oil (kg)	Number of Transformer	Amount of Oil (kg)	Number of Transformer	Amount of Oil (kg)	Number of Transformer	Amount of Oil (kg)
Electrical Distribution Station	3	18,600	3	11,880	11	0	4	1,960	21	32,440
Power Station	0	0	6	5,880	0	0	0	0	6	5,880
Private Factory	18	15,937	0	0	2	1,880	4	0	24	17,817
Transformer Storage Yard	10	2,940	7	0	5	0	553	135,000	575	137,940
Total	31	37,477	16	17,760	18	1,880	561	136,960	626	194,077

No of Transformers and Amount of Oils Found

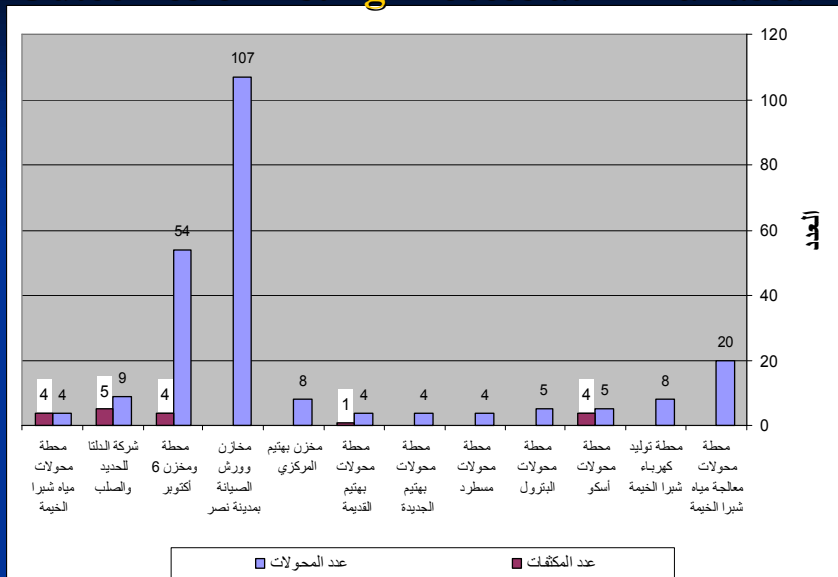
No of
Transformers
Total 626



Amount of oils
Total 194 ton



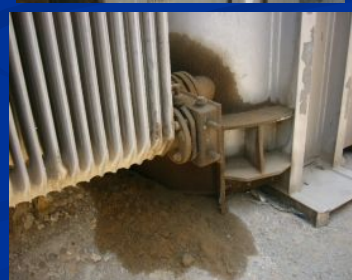
Outcomes of Listing Process at El Darrassah



The Highest Results of PCBs

<u>Transform ers oil 1966</u>	<u>71 L mg/</u>	<u>dry weight</u>
<u>Conc. of sediments</u>	<u>64 kg ug/</u>	<u>dry weight</u>

- 71 ppm means higher concentration than 50 ppm, the level of concentration to be treated under Stockholm Convention.



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Recommendable Measures to Control PCBs

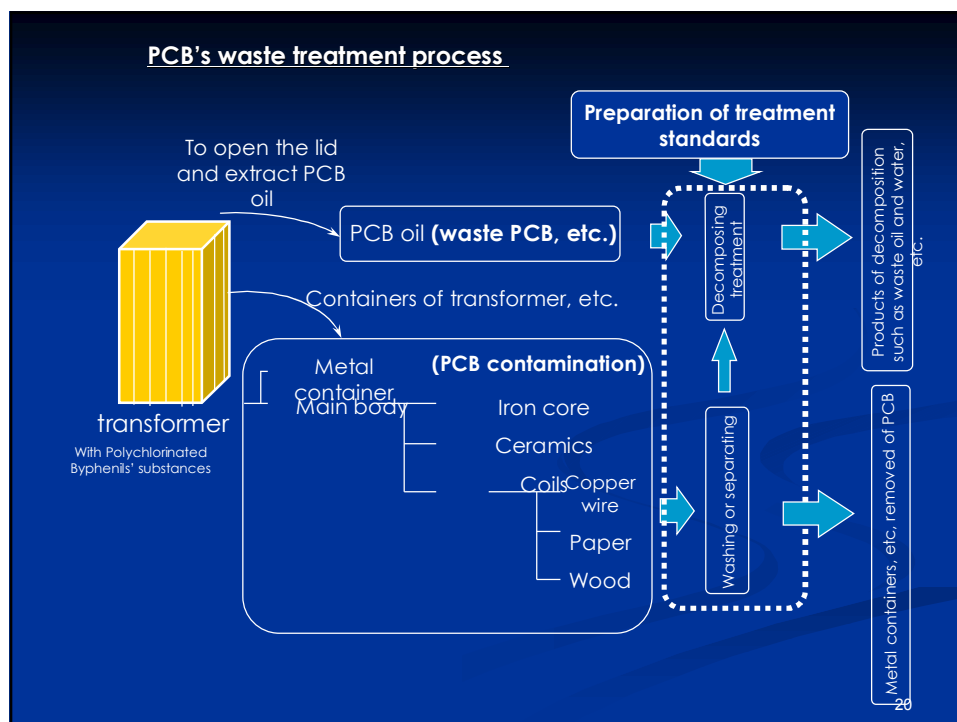
- Form a committee of competent personnel to prepare guidelines for the transportation, storage and treatment.
- Focus on the Ministry of Petroleum's role in the aggregation of consumed oils for sound disposal until disposed of.
- Provide grants to establish treatment plants of Polychlorinated Byphenils.

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Disposal methods of PCB's

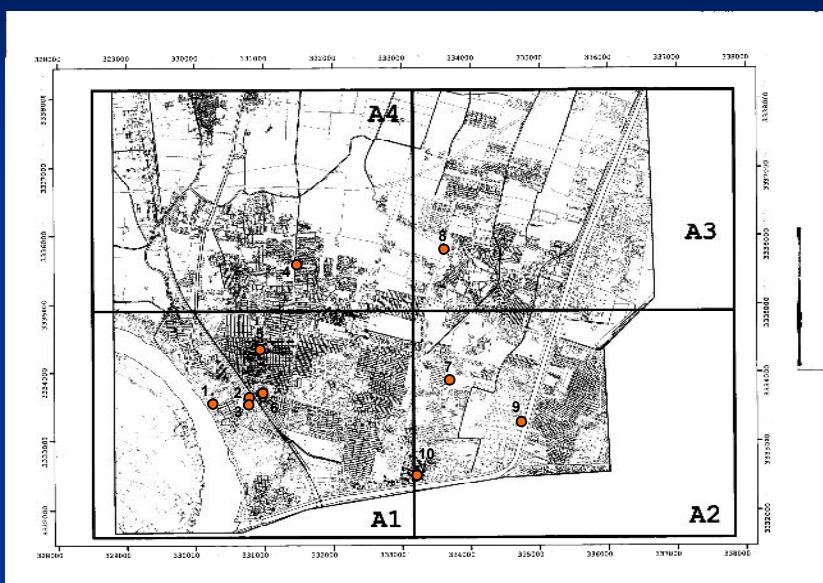
- Incineration
- Ultra sound waves
- Gamma rays
- Chemical processing
- Micro organisms
- Ultra violet rays
- Photic energy
- Safe burial

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Sampling Points of Road Dust



Analytical Results of PAHs

g/ug:Unit										
Sampling point	1	2	3	4	5	6	7	8	9	10
Concentration	33.1	32.6	39.8	28.8	49.5	74.2	40.6	50.9	23.5	39.8

- PAHs levels of Greater Cairo were higher than those found in many cities in the world and are sufficient to represent a degree of risk to the local population.

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Recommendable Measures to Control PAHs

- Enforcement of vehicle exhaust and imperfect engines programs.
- Reduction of diesel vehicles' emissions by turning to natural gas fuel.
- Controlling the emission of industries using developed combustion technologies.
- Restriction of open burning.

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HM Inventory Survey and Monitoring Activity

Sampling Point

Name	Type of Activity	Wastewater Discharge Amount	Wastewater Treatment Facility	Remark
Mardetex for Dying and Finishing	Dying Factory	40 m ³ / h	Equipped	Wastewater is discharged to Escandar Drainage.
Holioboles Printex for Dying and Finishing	Dying Factory	Not specified	Not equipped	Wastewater is discharged to Mosturod Drainage.
Glass for Dying	Dying Factory	100 m ³ / day	Equipped	Wastewater is discharged to public wastewater network.
-tholatheia for Dying and Finishing	Dying Factory	120 m ³ / day	Not equipped	Wastewater is discharged to public wastewater network.
El-Hegabeia	Dying Factory	30 m ³ / day	Equipped	Wastewater is discharged to Escandar Drainage.
Egyptian company for wool (wooltex)	Dying Factory	Not specified	Not equipped	Wastewater is discharged to Mosturod Drainage.
gyptian Textile for Dying and Finishing (Teaba)	Dying Factory	600 m ³ / day	Not equipped	Wastewater is discharged to public wastewater network.

Analytical Results of Chromium

Sample		Analytical Results	Egyptian Effluent Standard (Discharge to ditches)	Egyptian Effluent Standard (Discharge to wastewater network)	WB Pollution Prevention and Abatement Handbook Wastewater Standard	Japanese Effluent Standard	Japanese Environmental Standard	EU Directive for Source of Drinking Water (75/440/EEC)
		ppb	ppb	ppb	ppb	ppb	ppb	ppb
Wastewater from dying factories	El-Hegabeia	22.6	10	200	100	100	-	-
	Mardetex for Dying and Finishing	2.9						
	Glass for Dying	1.4						
	El-tholatheta for Dying and Finishing	10.0						
	Egyptian company for wool (wooltex)	8.4						
	Holioboles Printex for Dying and Finishing	2.5						
	Egyptian Textile for Dying and Finishing	0.4						
Drainage water	Eskander Drain	2.3	-	-	-	-	10	5

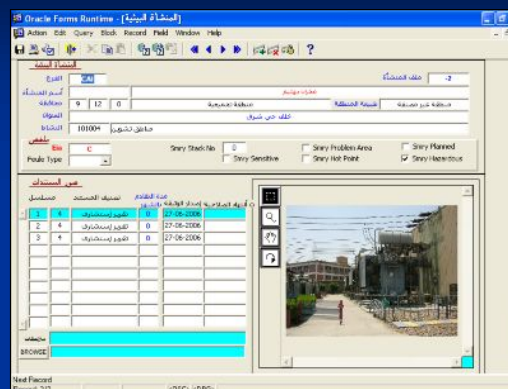
Note : Standard values as hexavalent chromium

- Comparing the analytical results of wastewater samples from dying factories with Egyptian wastewater standards, concentrations of chromium were higher than the standard values of wastewater discharged to ditches directly.

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Hazardous Substance Database

- It was developed as an expansion module of the Egyptian Regional Environmental Management Information System (EREMIS).



- The database can store the following information: general characteristic of PCBs, PAHs, and heavy metals (chromium and cadmium), summary of past study, inventory survey results, and analytical results

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International Seminar

- An international seminar was held on 26th and 27th February 2008.
- EEAA invited 9 Arab and African countries and international donors.
- Through the seminar, EEAA's experiences on hazardous chemical substances management were shared.



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Awareness
raising
workshops



Environmental Awareness

- Preparation of an environmental awareness plan for hazardous substances, particularly Polychlorinated Byphenils' compounds.
- Specify targeted categories.
- 3 workshops for stakeholders at the project.
- 5 training courses for work team and RBO's at EEAA.
- 5 workshops for Eastern District, Western District and Shubra El Kheima City council.
- 1 workshop including a field visit for the industrial facilities' officers.
- 5 awareness seminars for NGO's and the civil community.

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Key outputs

- Qualified executives at EEAA, capable of setting executive plans and determine polluted areas.
- Qualified labors, district environment offices and NGO's aware of health and environmental hazards at El Darrassah area.
- Inventory and monitoring of Polychlorinated Byphenils compounds at some industrial facilities in Shubra El Kheima.
- Laboratory qualified executives to monitor, measure and carry out micro analysis to oils, sediments and soil by special equipments; results' analysis and evaluation.

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Key outputs (Ctd.)

- Complete the environmental pollutants' database (sources – concentrations – health and environmental effects at the EEAA RBO's)
- Propose stealth limits for such pollutants to be added to the executive regulation of the law 4/1994.
- Strengthen the infrastructure through the participation of ministries, research centers and universities in the proposed solutions and the available alternatives.
- Specify the solutions, alternatives and safe methods to dispose of hazardous waste generated from various industrial activities.

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Sustainability

- Expanding PCBs Inventory Survey in Nationwide Level

On 11th May 2008, HSMD and SRBA implemented a self-motivated workshop to expand PCBs inventory survey in nationwide level with inviting all of RBOs. By beginning of August 2008, Greater Cairo, Tanta, and Assut RBOs prepared their action plans.

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Sustainability (Ctd.)

- Request on Ministry of Electricity to Include PCBs in Their Hazardous Substances List

Ministry of Electricity was aware of necessity to control Ministry of Electricity sent a letter to inquiry the way of management of old transformers suspected containing PCBs. EEAA to include PCBs in their hazardous substance list to enhance their obligation to control old transformers suspected containing PCBs.

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Sustainability (Ctd.)

- Action Taken by Petro-trade Company to Control Trade of Old Transformer Oils

The Petro-trade Company, which deal with used oils including transformer oils, issues an official letter to the traders of used oils for restricting trade of old transformer oils without checking PCBs concentration.

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Obstacles

- Lack of updated databases; hence, no complete data are obtained.
- Random storage at storage areas; hence, global listing processes are hindered.
- Listing of transformers and capacitors under operation is not allowed; hence, listing processes are inadequate.
- Circulation of PCB's contaminated transformers and capacitors is not prohibited.
- No warning signs on equipments likely to contain PCB's; hence, they are lost.



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Recommendations

- Complete the listing and inventory processes throughout Egypt.
- Form a committee of competent personnel to prepare guidelines for the transportation, storage and treatment.
- Provide integral laboratories to carry out the required oil analysis to ensure they are PCB's free.
- Proceed with the environmental awareness raising efforts concerning these highly hazardous cancerous substances, to all categories at the community and decision makers.

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Recommendations (Ctd.)

- Equip the RBO's with field inspection equipments, in addition to lab analysis equipments.
- Focus on the Ministry of Petroleum's role in the aggregation of consumed oils for sound disposal until disposed of.
- Focus on the role of inspection and water surfaces police in false control of consumed oils.
- Provide grants to establish treatment plants of Polychlorinated Byphenils.

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Thank
you

•ELHAM REFAAT
•TASK FORCE

