

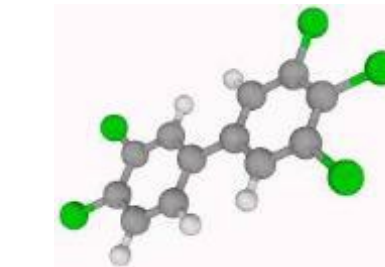
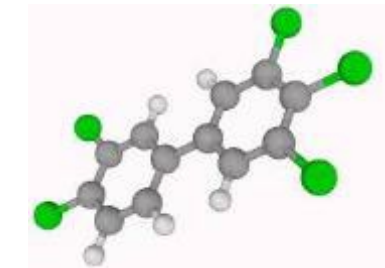
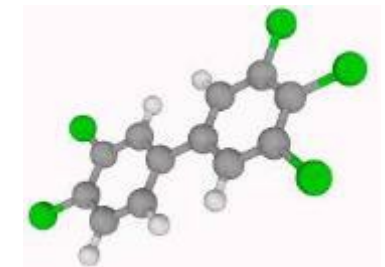
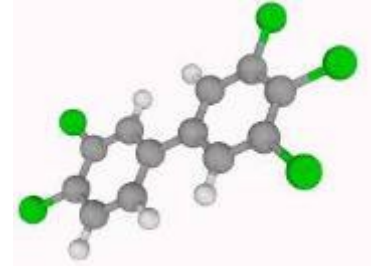
“Development of PCB inventories” Experience in Peru



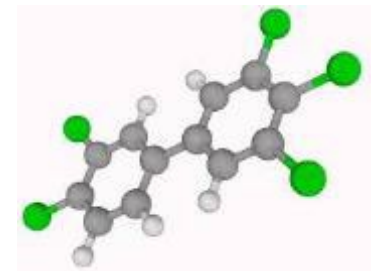
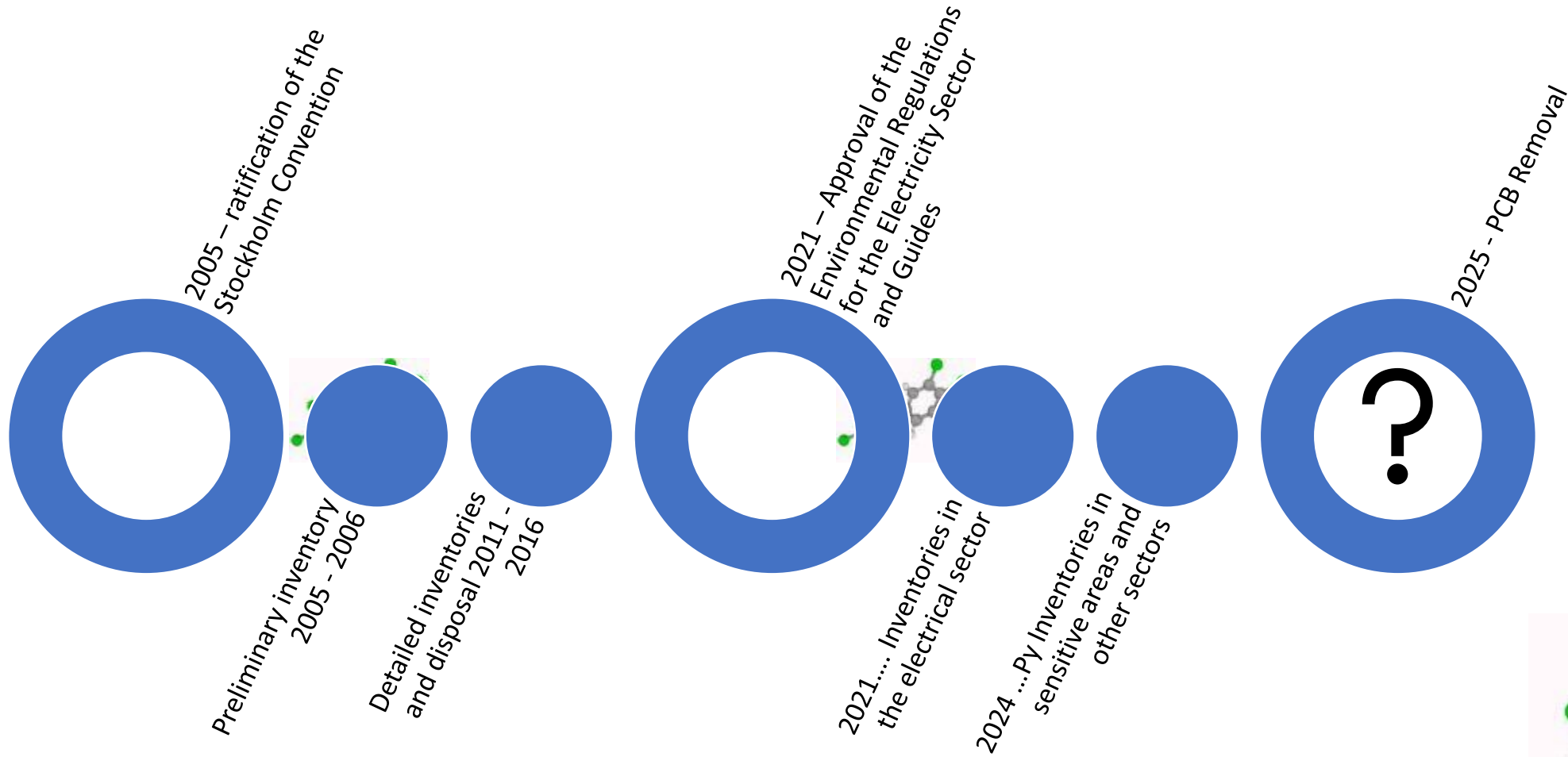
October 31, 2024

Content

- Milestones in PCB management
- Inventory and elimination of PCBs (2011 – 2016)
 - Field work
 - Results
- Lessons learned
- Challenges

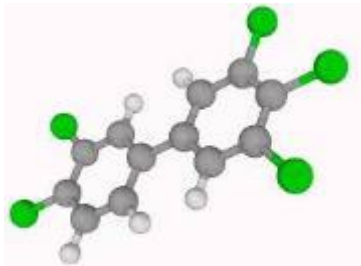


Milestones in the management of polychlorinated biphenyls



Inventory 2011 - 2015

- Scope: national
- Sectors:
 - Electricity (17 companies)
 - Industrial (3 companies)
 - Miner (2 companies)
 - Aeronautical transport (7 airports)
 - Sanitation (1 drinking water company)



Procedures

- Detection

- Dexsil L2000DX Equipment
- Clor N Oil



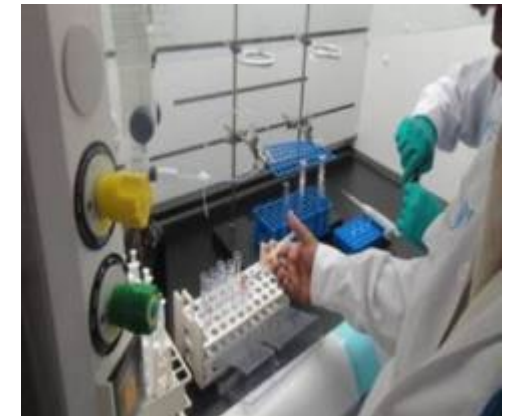
- Sampling

- Project Staff
- Staff of electric companies

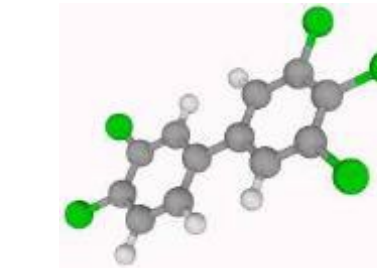
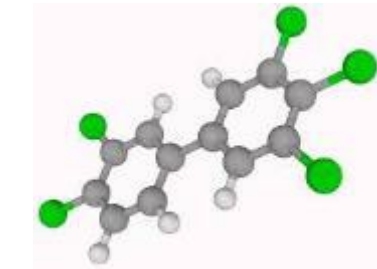
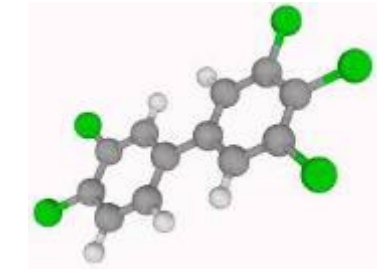
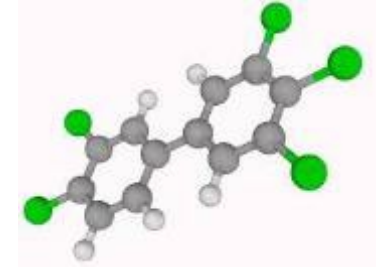


- Analysis

- Gas chromatography in the DIGESA/MINSA Laboratory



15,912 units evaluated (12,127.4 tons)



1st Stage (10,717 equipment)

- Sampling by the project team
- Analyzer L2000DX[®] + chromatographic analysis (956 samples 37.45% positive)
- Gas chromatography analysis (9,701 samples)
- Chlorine – N- Oil + chromatographic analysis (1 016 samples)



2nd Stage (2,501 equipment)

- Training and guidance for sampling and discarding
- Sampling by partner companies
- PCB disposal using the Clor -N -Oil[®] kit
- Gas Chromatography Analysis



Results

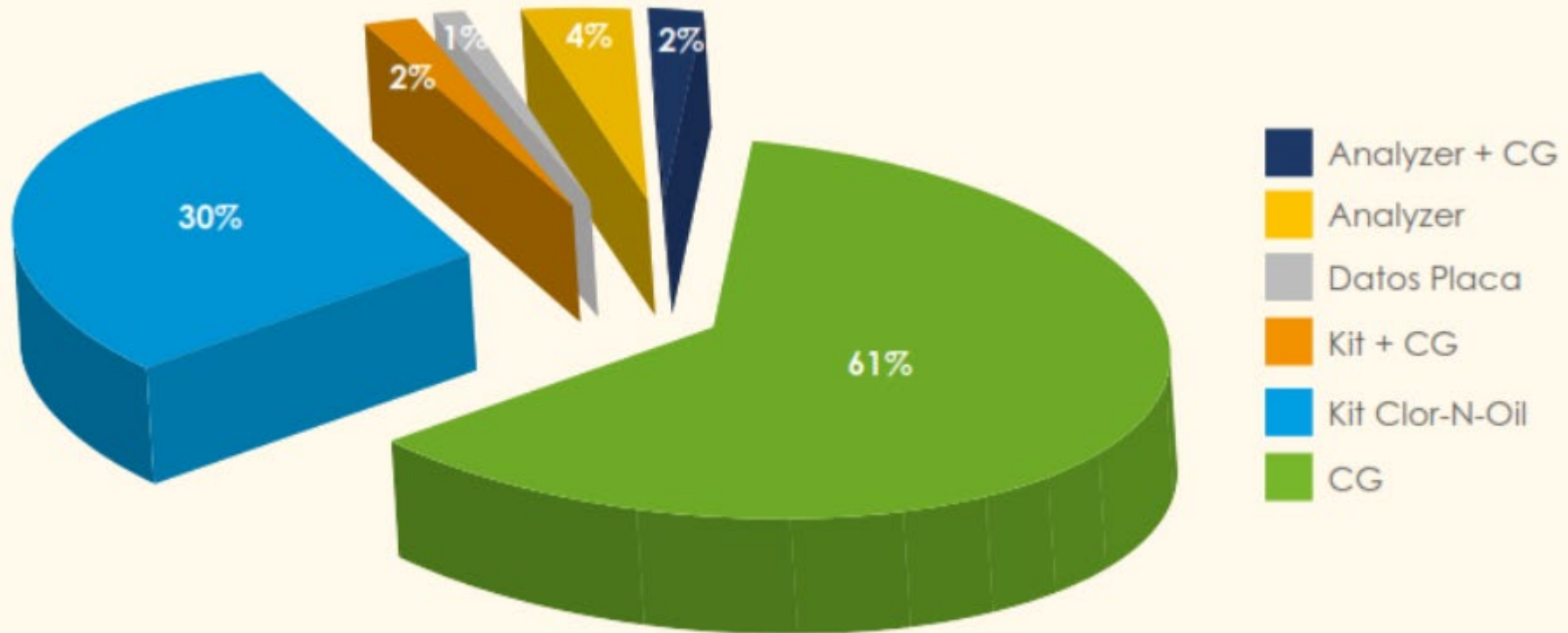
- 44% of the equipment was manufactured by ABB, Brown Boveri Industrial Canepa Tabini SA and Delcrosa
 - 16% were manufactured before 1983
 - 73% after 1983
 - 12% had no manufacturing date
- 309 devices with PCBs in concentrations > 50 ppm (1.9% of the total)
 - 58.3% of equipment had PCB concentrations between 50 and 500 ppm (37.4% of gross weight)
- 61.9% of the gross weight had concentrations > 5000 ppm or pure PCB

Company	Number of teams	Gross Weight (tons)
CHAV	11	63.05
EDN	334	520.43
EDU	1 060	539.97
EGA	15	80.65
EGM	215	490.02
ELC	1 919	662.79
ELN	1 260	764.56
ELO	821	705.79
ELP	41	527.07
ELS	585	471.04
ENO	1 461	722.80
UPR	1 186	625.12
THAT	2 273	1 064.02
EUC	552	302.70
HID	2 738	2 328.04
MTC/CAJ/	3	1.17
MTC/CHI/	6	2.02
MTC/CUS/	10	4.79
MTC/IQT/	11	8.73
MTC/JUL/	1	1.37
MTC/LAP/	10	8.77
MTC/TTP/	3	0.95
SEA	1 144	1 237.56
SHO	47	44.10
SNP	29	757.17
TRUPAL	36	152.09
MARSA	50	26.08
DUKE	2	6.04
Aris	48	1.18
SEDAPAL	41	7.38
Grand total	15 912	12 127.4



Evaluated equipment

Distribution of equipment according to the applied method

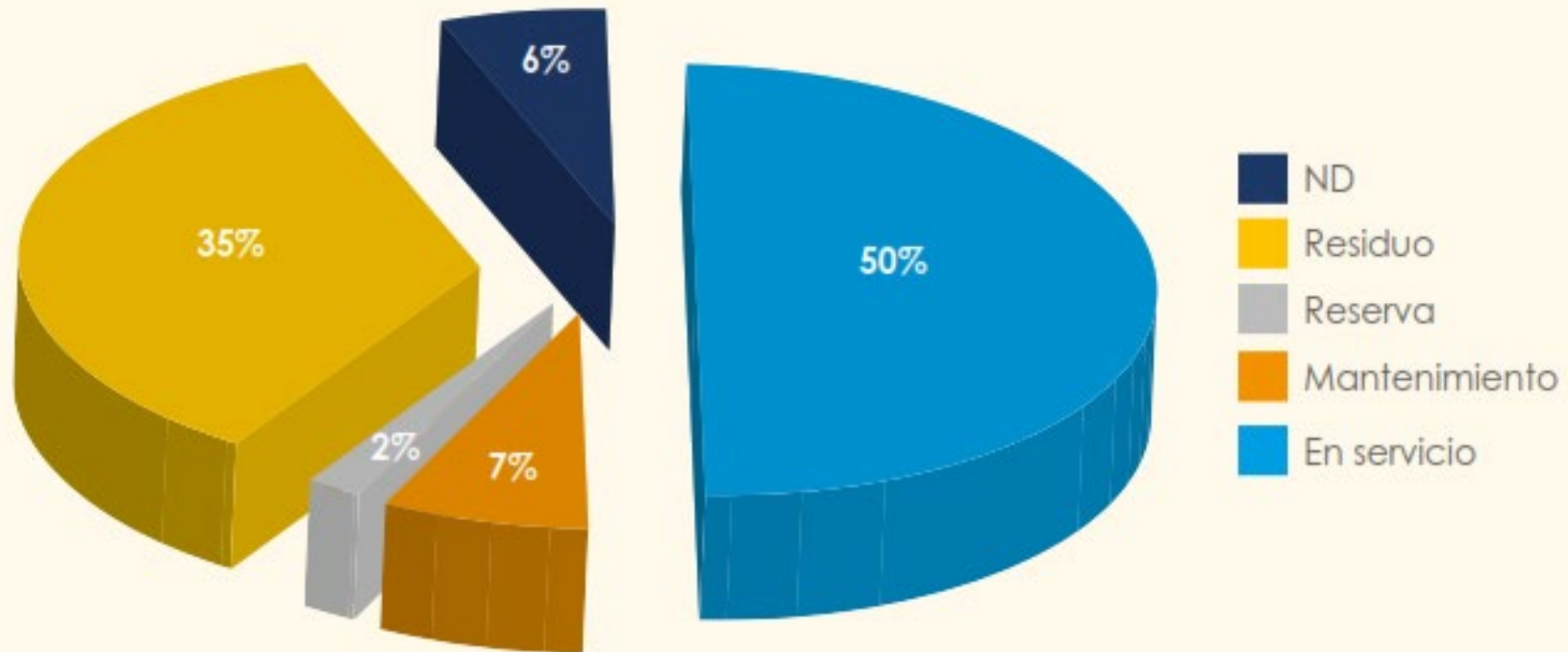


PCB contaminated equipment

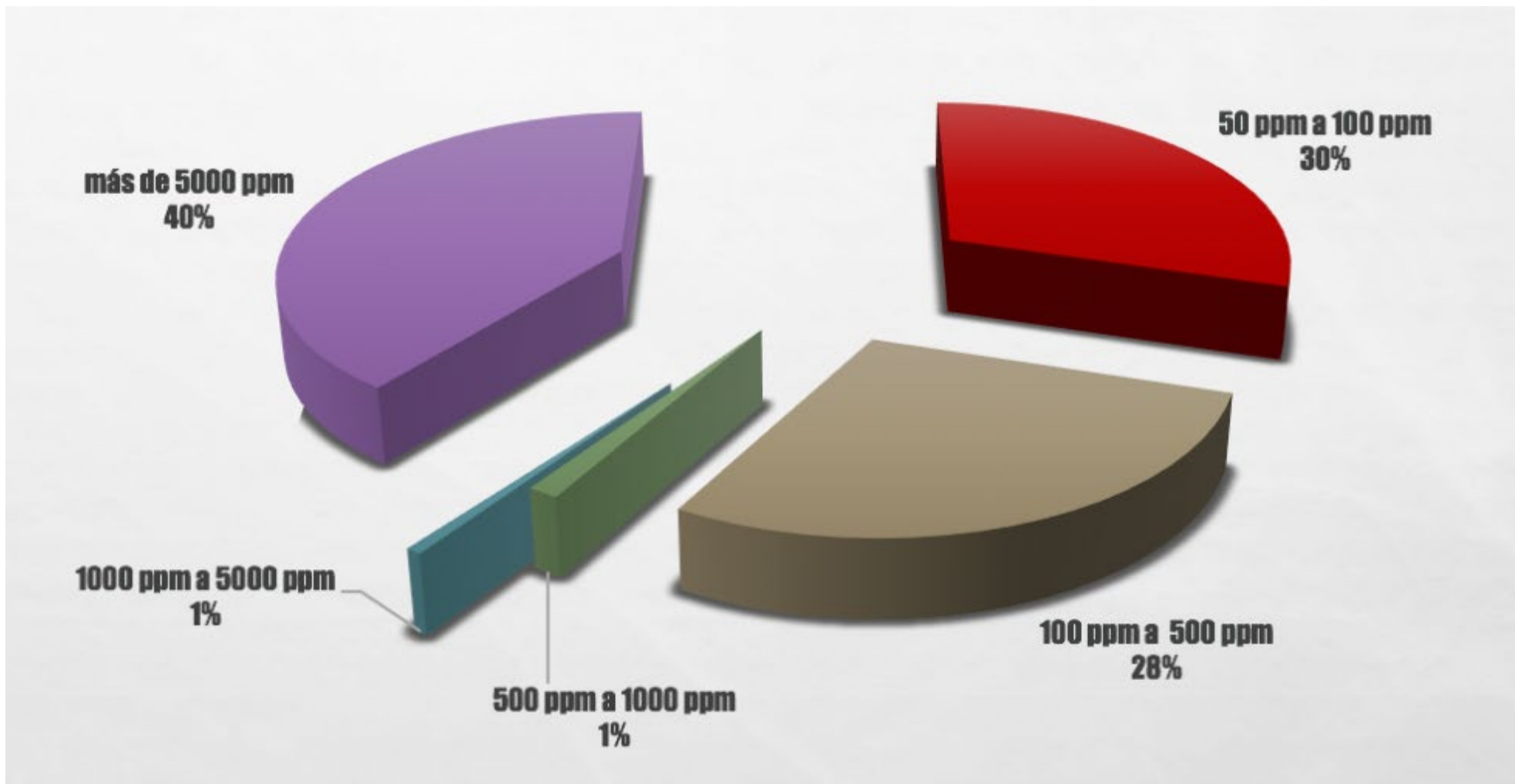
Company	Gross weight (kg)	Oil weight (kg)	Number of equipment with more than 50 ppm of PCB
EDN	4 720	1 307	6
EDU	12 741	3 888	21
EGA	18 977	5 947	8
EGM	3 751	863	5
ELC	10 388	2 881	91
ELN	6 168	1 478	13
ELP	17 065	5 315	32
ELS	8 440	2 775	3
ENO	1 034	332	2
UPR	742	177	2
THAT	35 756	10 582	6
HID	12 174	3 501	22
MTC/IQT/	2 500	750	5
MTC/LAP/	1 262	562	1
MTC/TTP/	500	150	1
SEA	1 280	384	1
SHO	32 900	2 970	14
SNP	3 600	1 270	2
TRUPAL	114 398	39 457	24
DUKE	6 043	1 978	2
ARIS	1 178		48
Grand Total	295 618	86 566	309



PCB contaminated equipment according to its condition

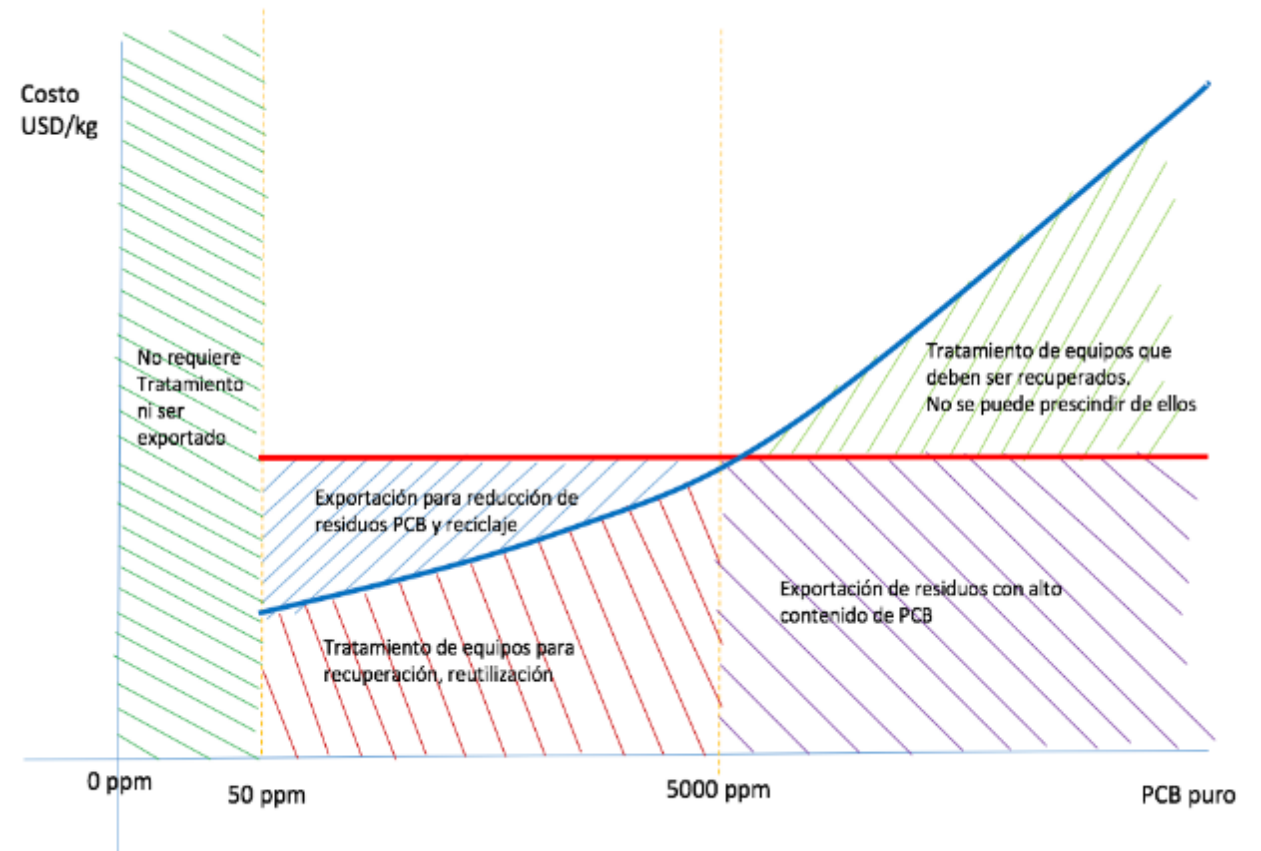


Distribution of equipment according to PCB concentration



Environmentally Sound Elimination of PCBs

- Reduce the waste generated
- Reduces the transport of PCB-containing stocks and waste
- Reuse decontaminated equipment
- Recycling of decontaminated waste



PCB Removal Options

Process	Number of equipment	Gross weight (kg)
Export	96	41 136,00
Treatment	168	101 330.43
Grand total	264	142 466,43



Treatment and export

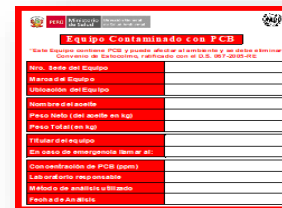
Company	Number of equipment	Weight (kg)
Electrodunas S.A.	18	11 089
Electrocentre SA	91	10 593
Electronorte S.A.	10	4 383
Electroperu S.A.	1	2 340
Electrosur S.A.	3	8 440
Electronorthwest SA	2	1 034
Electro Puno SAA	2	742
Electro South East SAA	4	33 956
Hydrandina SA	19	9 824
SEAL	1	1 280
SN Power	2	3 600
DUKE Energy	1	4 853,43
EDELNOR	6	4 720
EGEMSA	2	3616
CORPAC Iquitos	5	360
CORPAC Tarapoto	1	500
Total treatment	168	101 330.43



Company	Number of equipment	Weight (kg)
EDU	1	569
EGA	8	18 977
THAT	1	540
HID	2	1 850
Aris	49	3 150
DUKE	1	1 190
EGM	3	135
ELP	31	14 725
Total Export	96	41 136

Lessons learned

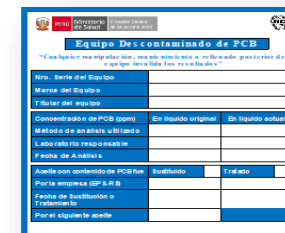
- Support from the competent authorities
- Importance and decision from business management to work on the issue
- The participation and involvement of the company's technical staff is important
- Identify the best labeling (material and information)
- Companies conducted voluntary inventories (change of attitude)



Equipo Contaminado con PCB

Este equipo contiene PCB y puede afectar al ambiente y a la salud humana. Se recomienda el etiquetado y el etiquetado con el símbolo de peligro.

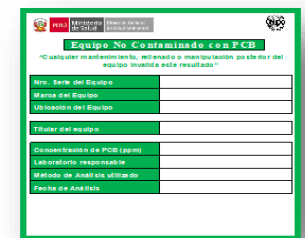
Nro. Serie del Equipo	
Marca del Equipo	
Ubicación del equipo	
Nombre del dueño	
Peso Neto (con aceite en kg)	
Peso Total (en kg)	
Título del equipo	
En caso de emergencia, llame al:	
Concentración de PCB (ppm)	
Laboratorio responsable	
Fecha de análisis	
Fecha de análisis y etiquetado	



Equipo Descontaminado de PCB

Este equipo no contiene PCB, no es peligroso y no puede afectar al ambiente y a la salud humana.

Nro. Serie del Equipo		
Marca del Equipo		
Ubicación del equipo		
Nombre del dueño		
Concentración de PCB (ppm)	En líquido original	En líquido actual
Método de análisis utilizado		
Laboratorio responsable		
Fecha de Análisis		
Adiós con contenido de PCB fue	Residuo	Tratado
Por la empresa (SP & RB)		
Fecha de distribución o tratamiento		
Por el siguiente aceite		



Equipo No Contaminado con PCB

Este equipo no contiene PCB, no es peligroso y no puede afectar al ambiente y a la salud humana.

Nro. Serie del Equipo	
Marca del Equipo	
Ubicación del Equipo	
Título del equipo	
Concentración de PCB (ppm)	
Laboratorio responsable	
Método de Análisis utilizado	
Fecha de Análisis	

Challenges

- Strengthening the decision-making capacities of authorities
- Approve the PCB Regulation (general)
- Strengthening analytical capabilities
- Complete the PCB inventory in the electrical sector
- Conduct PCB inventory in the mining, industrial and transportation sectors
- Eliminate PCB stocks and waste with appropriate technologies



Thank you!

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