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Inventory of Polychlorinated Biphenyls (PCBs) in the Republic of Moldova

2021

The Inventory of Polychlorinated Biphenyls (PCBs) in the Republic of Moldova - 2021 was elaborated by the Ministry of Environment of the Republic of Moldova in cooperation with Experts Association ProMediu, in partnership with the Stockholm Convention Regional Centre in the Czech Republic hosted by RECETOX, Masaryk University within the UNEP/GEF funded project "Review and Update of the National Implementation Plan for the Republic of Moldova under the Stockholm convention on Persistent Organic Pollutants (POPs)" (GEF ID 10354) facilitating the implementation of the Stockholm Convention in the Republic of Moldova through the review, update and submission of the National Implementation Plan (NIP) to the Conference of the Parties of the Stockholm Convention (COP).

The Inventory was drafted based on the methodologies outlined in the following guidance documents: UNEP / PEN Polychlorinated Biphenyls (PCB) Inventory Guidance (version 2016, (https://wedocs.unep.org/bitstream/handle/20.500.11822/31250/PCBIG.pdf?sequence=1&isAllowed=y) Stockholm convention guidance documents, (http://toolkit.pops.int/), as for For PCB waste, the Basel POPs waste general technical guidelines (UNEP, 2021) and the specific PCB technical guideline (UNEP, 2017) (http://www.basel.int/Implementation/POPsWastes/TechnicalGuidelines/tabid/5052/Default.aspx) and EMEP/EEA air pollutant emission inventory guidebook in compliance with the national legal framework on PCB – Regulation on PCB, approved by Governmental Decision nr 81/2009 (https://www.legis.md/cautare/getResults?doc_id=119567&lang=ro).

Coordinated: Ministry of Environment of the Republic of Moldova

Authors:

RECETOX, Faculty of Science, Masaryk University, Brno, Czech Republic: Kateřina Šebková, Director, Stockholm Convention Regional Centre (SCRC-CZ), Ivan Holoubek, lead inventory expert (SCRC-CZ)

Experts Association "ProMediu": Tatiana Tugui, director, Tatiana Echim, environmental expert.

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Legal reference

Stockholm Convention on POPs

Polychlorinated biphenyls (PCB) are listed in Annex A to the Stockholm Convention on Persistent Organic Pollutants with a specific exemption for the continued use of PCB in articles in accordance with the provisions of Part II of Annex A, to be exercised by all Parties to the Convention. The production of PCB and new uses are prohibited, and equipment containing PCB shall not be exported or imported except for the purpose of environmentally sound waste management.

According to Part II of Annex A, each Party shall take action towards the elimination of the use of PCB in equipment (e.g., transformers, capacitors or other receptacles containing liquid stocks) by 2025, subject to review by the Conference of the Parties. Equipment containing PCB greater than 0.005% (50 mg/kg) and volumes greater than 0.05 L should be identified and removed from use.

Part II of Annex A also provides that each Party shall make determined efforts designed to lead to environmentally sound waste management of liquids containing PCB and equipment contaminated with PCB having a PCB content above 0.005% (50 mg/kg), in accordance with paragraph 1 of Article 6, as soon as possible but no later than 2028, subject to review by the Conference of the Parties.

The requirement to prepare a PCB inventory is clearly regulated in Part II of Annex A of the Stockholm Convention, according to which each Party shall take action in accordance with the following priorities:

(i) Make determined efforts to identify, label and remove from use equipment containing greater than 10 % PCB and volumes greater than 5 liters;

(ii) Make determined efforts to identify, label and remove from use equipment containing greater than 0.05 % PCB and volumes greater than 5 liters;

(iii) Endeavour to identify and remove from use equipment containing greater than 0.005% PCB and volumes greater than 0.05 liters.

Environmentally sound waste management of liquids containing PCB and equipment contaminated with PCB needs to be achieved by 2028. The undertaking of a detailed inventory is an indispensable prerequisite for the achievement of the 2028 objective.

Furthermore, paragraph (f) of the Stockholm Convention stipulates that each Party shall endeavor to identify other articles containing more than 0.005 % (e.g. cable-sheaths, cured caulk and painted objects) and manage them in an environmentally sound manner. Such so-called 'open applications' are, however, not the focus of this guidance, but shall be addressed in a separate document.

Article 15 of the Convention requires each Party to report to the Conference of the Parties (COP) on the measures it has taken to implement the provisions of the Convention and on the effectiveness of such measures in meeting the objectives of the Convention. The Conference of the Parties (COP) decided at its first meeting that national reports shall be submitted every four years. The information provided in the national reports is one of the main references to be used for the evaluation of the effectiveness of the Convention in accordance with its Article 16 including the progress towards the elimination of PCB.

The Republic of Moldova, being a party to Stockholm Convention has identified the need to address the PCB issue and introduced following priorities to the National Implementation Plan of the Stockholm Convention (NIP) National Strategy on the reduction and elimination of POPs (adopted by Gov. Decision nr. 1155/2004):

- Adoption of legal framework – PCB Regulation (Gov. Decision nr. 81/2009)
- Capacity building for energy sector for PCB identification in power equipment
- Inventory of PCBs content in power equipment in the energy sector
- Country wide handling of PCB contaminated and damaged equipment

The **new draft NIP on SC (2023-2027)** provides for the continuous efforts to support the country in EMS of PCBs, by supporting the environmental authorities on increasing their capacity on PCB evidence, laboratory analysis and also by encouraging the key industries to comply with the legal provisions on PCB management, particularly storage and elimination.

In accordance with Article 15 of the Convention, each Party shall report to the Conference of the Parties on the measures it has taken to implement the provisions of the Convention and on the effectiveness of such measures. Information on progress in eliminating PCB is reported in part C of national reports pursuant to Article 15. The national reports submitted by the Republic of Moldova can be viewed at the Convention's webpage http://www.pops.int/Countries/Reporting/NationalReports/tabid/3668/Default.aspx.

Basel Convention

Since all PCB become waste, Parties to the Basel Convention have to take into account the obligations under the Basel Convention as refers to reporting on export (Table 4) and import (Table 5) of hazardous waste. PCB-relevant waste streams according to Annex I 'Categories of wastes to be controlled' are designated as 'Y10' (UNEP, 1992). The national reports of the Republic of Moldova submitted yearly can be viewed at the Basel Convention's webpage http://www.basel.int/Countries/NationalReporting/NationalReports/BC2019Reports/tabid/8645/Default.aspx.

Waste types that may contain PCB can be found in Annex VIII of the Basel Convention in List A (*i.e.,* metal and metal-bearing wastes in A1180 and A1190 that may be hazardous due to the presence of PCB).

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What are PCBs

Polychlorinated Biphenyls (PCBs) are among a group of man-made chemicals that are known as Persistent Organic Pollutants (POPs). PCBs were commercially produced world-wide on a large scale between the 1930s and 1980s. Given their extraordinary chemical stability and heat resistance, they were extensively employed as components in electrical and hydraulic equipment and lubricants.

The chemical structure of PCB is shown in Figure 1. The possible positions of chlorine atoms on the benzene rings are denoted by numbers assigned to the carbon atoms.

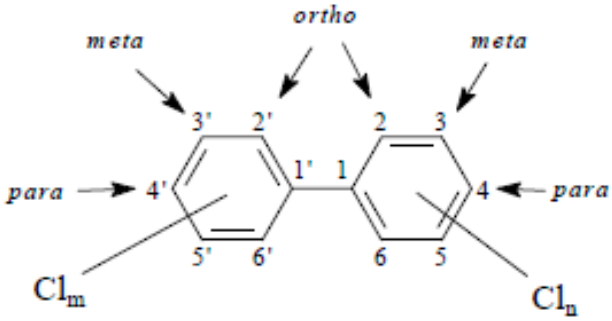

Figure 1: Chemical structure of PCB (m and n are the number of chlorines in each ring)

PCB, as listed in Annex A of the Stockholm Convention, are commercial products that have been produced industrially for a number of uses. In the Stockholm Convention and according to Article 3, Article 6 and Annex A Part I, PCB are from intentional production.

PCB have not been produced or used as a single compound but rather as complex mixtures. The most well-known PCB products are Aroclor, Clophen, Phenochlor, Kanechlor, Pyralene, Fenclor, and Delor (for countries of origin, see Table 1). Trade names of commercial mixtures are given in Table 2 together with their main uses in either transformers or capacitors. The commercial products were manufactured towards meeting a defined degree of chlorination to fulfil technical requirements.

Table 1: Names of commercial PCB and country of origin

Country	Commercial product	Country	Commercial product
China	PCB	Czechoslovakia (former)	Delor
France	Phenoclor, Pyralene	Japan	Kanechlor
Germany	Clophen	Soviet Union (former)	Sovol, Sovtol, trichlorodiphenyl
Italy	Fenoclor	United States of America	Aroclor

Table 2: Trade names from producers of PCB

Asbestol (trans, cap)	Hydol (trans, cap)
Askarel	Kanechlor (trans, cap)
Bakola 131 (trans, cap)	Montar
Biclor (cap)	Nepolin
Chlorextol (trans)	No-Flamol (trans, cap)
Chlorinol	Phenoclor (trans, cap)
Clophen (trans, cap)	Pydraul
Clorphen (trans)	Pyralene (trans, cap)
Delor	Pyranol (trans, cap)
Duconol (cap)	Pyroclor (trans)
Dykanol (trans, cap)	Saf-T-Kuhl (trans, cap)
EEC-18	Santotherm FR
Elemex (trans, cap)	Santovac 1, Santovac 2
Eucarel	Siclonyl (cap)
Fenchlor (trans, cap)	Solvol (trans, cap)
Elemex (trans, cap)	Sovol
Hivar (cap)	Therminol FR

Each trade name may correspond to one or several products with varying chlorine content. Denominations in parenthesis denote use in transformers (trans) or capacitors (cap)

They have been used in **two types of applications:**

1. **Closed uses**: dielectric fluids in electrical equipment such as transformers, capacitors (big industrial capacitors, but also small capacitors in household electrical appliances), heat transfer and hydraulic systems.

2. **Open uses**: as pesticide extenders, sealant, carbonless copy paper, industrial oils, paints, adhesives, plastics, flame retardants and to control dust on roads.

In the 1970s, owing to severe concerns pertaining to their human toxicity, suspected carcinogenicity, and environmental persistence, several countries limited the use of PCBs. PCBs are classified as probable human carcinogens and produce a wide spectrum of adverse effects in animals and humans, including reproductive toxicity, teratogenicity and immunotoxicity.

Given the recognition of PCB as an environmental problem of global proportions, with numerous studies having detected PCB in various compartments of the environment and in remote areas, they were listed in the Stockholm Convention as one of the initial twelve POPs. All remaining uses of PCB (e.g. PCB transformers, capacitors or other receptacles containing liquid stocks) must be eliminated by Parties to the Convention on Persistent Organic Pollutants by the year 2025.

3

PCB Regulatory framework

In the Republic of Moldova exists the legal framework that regulates PCB, - Regulation on PCB approved by the Governmental Decision nr. 81/2009. Its objectives are as follows:

- to create the legal framework for the harmless ecological management of polychlorinated biphenyls and equipment containing polychlorinated biphenyls;
- efficient implementation of international treaties in the field of chemical management to which the Republic of Moldova is a party,
- alignment with the provisions of Regulation no`. 850/2004 / EC of the European Parliament and of the Council of Europe of 29 April 2004 on persistent organic pollutants and amending Directive 79/117 / EEC (published in the Official Journal of the European Union No L 158/7 of 30.04.2004) and Council Directive 96/59 / EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCBs/TPCs), (published in Official Journal of the European Union No L 243/31 of 24.09.1996).

Since its adoption, the regulation has been modified several times, in compliance with the framework legislation adopted and the institutional changes that were occurred during the last 10 years.

PCB Regulation is:

- aligned to the provisions of Regulation no. 850/2004 / EC of the European Parliament and of the Council of Europe of 29 April 2004 on persistent organic pollutants;
- establishes inventory form (equipment with a PCB volume of more than 5 dm^3 is subject to mandatory inventory in the manner established by Regulation);
- prohibits the production and placing on the market of pure PCBs, in mixtures or as components of articles or equipment;
- regulates management of retained waste consisting of PCBs, containing PCBs or contaminated with PCBs may be exported for final disposal in accordance with Article 64 of Law no. 209/2016 on waste;
- sets labelling requirements for contaminated equipment
- stipulate storage conditions, evidence and requirements for PCB contaminated equipment / PCB containing oil;
- stipulates procedure for authorization of decontamination and / or disposal of equipment containing used PCBs or PCBs.

4

Scope of an Updated PCB Inventory

The main purpose of the updated PCB inventory in the Republic of Moldova is update the existing information to identify the status of remaining PCB products, the major actions on eliminating and phase-out of use of identified PBC equipment in 2009, the list of major PCB holders and industries and places used, and the level of implementation of the PCB regulation, with particular focus on Art. 7 of the regulation that sets operating deadlines for PCB-contaminated equipment.

The need to update the PCB inventory is reveal the issues related to PCB management, on finding the quantity of the PCB equipment still in use and on setting the final steps needed to achieving environmentally sound waste management of liquids containing PCB and equipment contaminated with PCB.

Some of the **key challenges occurred while updating the PCB inventory** in 2020 were as follows:

- **Lack of annual data submission on PCB inventory** results/ annual PCB inventory development, according to art. 9 of PCB Regulation Gov. Decision nr. 81/2009 to the Environmental authorities (2010-2017 Ministry and starting with 2018 to Environmental Agency);
- **Restructuration and big energy supply companies** (the process that implied the change of staff, infrastructure and selling of assets);
- **Individual companies included in 2009 inventory under the Consumers component** show a lack of knowledge regarding the PBC equipment or lack of interest to engage in inventory process (out of 20 letters sent to biggest economic operators, only 5 official responses were received);
- PCB inventory didn't not take into account **the informal sector,** however the certain share of potential PCB equipment is present there as well;
- Lack of **accredited national laboratory** to undertake laboratory testing of the PCB content of oil, thus the concentration indicated for the equipment was the one from 2009 screening results, that could actually vary if the laboratory analysis would have been performed at present. Almost all the companies reported the cases of adding the oil / changing and clean up the oil procedures during the last 10 years.

The present inventory has only looked at the PBC in some **Closed uses**: dielectric fluids in electrical equipment such as transformers, capacitors and circuit breakers. No open application data was collected.

Summary outcomes of first PCB inventory - 2008-2010:

The present document builds upon the results of PCB inventory, conducted in the Republic of Moldova within the period of 2007-2010 within the following TA projects:

- Canadian Grant for the Remediation of POP Pesticides Polluted Areas
- and Clean-Up of PCB Contaminated Oil in Power Equipment, Canada Persistent Organic Pollutant Fund (2007-2008) – CAN $ 444,450
- POP Stockpiles Management and Destruction Project - Grant GEF/WB TF055875 (2006-2010) - US $12,6 million (including US $6.35 million GEF Grant, US$3.72 million Moldova Government Contribution, US$2,53 million–other donors)

Based on existing data, the PCB has never been produced in the Republic of Moldova, all the quantities were imported. it was estimated that most of the PBC in Moldova is concentrated within the electricity and energy sector.

The **primary inventory included in NIP on POPs (2004)** data identified the presence of the 30.000 tons of dielectric oils, used in electrical power installations, including of approx. 23.300 tons in high voltage transformers, 5,400 tons in circuit breakers and 400 tons in capacitors. From the total amount of preliminary assessment is was estimated that 95% is the equipment that belongs to power supply entities (producers, transporters and distributors) and 3-5% to the consumer's electrical installations.

The detailed **PCB Inventory in closed system had been launched in Sep 2008.**

The PCB Inventory in closed systems had been divided in two sectors:

(1) energy sector which includes – generation, transportation and distribution, totally 28000 of electrical units with oil to be inventoried and

(2) Consumers – 7000 electrical units to be inventoried

The activities were comprised of 3 stages:

Component 1. Screening Analyses of oil samples

The PCB screening is done in two level:

1. PCB screening is done using L2000Dx analyzer

2. If PCB content is above 50 ppm - the PCB false positive samples are analyzed by GC-MS In total 4 screening centers (three in energy sector) and the fourth one for Consumers at State Hydro meteorological Services were provided with equipment with L2000Dx and reagents including the GC-MS method.

Component 2. Inventory of PCB containing equipment

In energy sector, 8 companies were involved in inventory (4 companies in the generation sector, 1 transport company and 3 distributors of energy). The staff of the companies has been trained on how to perform the inventory and equipped with the relevant sampling tools and PPE.

Inventory results are to be introduced in the National Database for electrical equipment with volumes of dielectric oil greater than 5dm^3.

Table 3. Overview of the PCB containing equipment inventory from energy sector - 2009:

PCB equipmentsubject of inventoryin 2009

Equipment units filled with dielectric oil in quantities greater than 5 dm3 in the power sector (indicative estimate for 2008)

Enterprises	Transformers	Other equipment	Total
Power plants			
CET-1 Chisinau, S.A.	18	138	156
CET-2 Chisinau, S.A.	24	305	329
CET Nord, S.A.	21	208	229
Nodul hidroenergetic, ÎS.	4	78	82
Subtotal power plants	**67**	**729**	**796**
Electricity transmission company Moldelectrica, ÎS.	**331**	**8 379**	**8 710**
Electricitydistributioncompanies			
RED Union Fenosa, ÎC.S, S.A.	8 966	1 477	10 443
RED Nord, S.A.	3 274	445	3 719
RED Nord-Vest, S.A.	2 102	0	2 102
Subtotal RED-le	**14 342**	**1 922**	**16 264**
Total	**14 740**	**11 030**	**25 770**

Component 3. PCB management and disposal

The total amount of equipment that have been dismantled, packed and disposed in EMS manner is: 934 tons of equipment with PCB content (of which oil - approx. 220 tons), that includes 18,660 PCB electric capacitors dismantled from 13 transformer stations of the State Enterprise “Moldelectrica”.

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PCB Inventory summary

5.1 PCB application & equipment subject of assessment

According to the PCB management guidelines, developed by the UNEP in compliance with the SC provisions, the equipment with liquids containing PCB (e.g. transformers, capacitors or other receptacles containing liquid stocks) with a volume above 0.05 liter and equipment contaminated with PCB content above 0.005 % need to be included in a PCB inventory. The scope could be adjusted to the actual situation in the country in question and the list could be shorted if some of the following PCB products were never produced or imported in a country.

It is believed that a large share of the PCB containing equipment are already beyond their lifetime. Most of the equipment containing or contaminated with PCB has been discarded in an inappropriate manner. Waste, discarded equipment and sites should therefore be a major concern for countries and need to be included in PCB inventories.

All entities having PCB-containing or PCB-contaminated equipment in use or just out of use (short-term temporary storage) awaiting first step in disposal should be identified. In this context, Annex VIII of the Basel Convention should be consulted; List A with codes A1180 and A1190 specifies metal and metal-bearing wastes that may be hazardous due to the presence of PCB.

Transformer**:** is a device that allows raising or lowering the voltage in a circuit by means of a magnetic field, maintaining the same power. Its operation is based on the principle of electromagnetic induction. Transformers probably represent the largest source of PCB.

Transformer oil or insulating oil: primary function of the transformer oil is to insulate and cool a transformer. In order to fulfill this function, the oil must have high dielectric strength, thermal conductivity, and chemical stability.

Capacitors: exist in many forms, styles, lengths, girths, and from many materials. They all contain at least two electrical conductors (called “plates”) separated by an insulating layer (called the dielectric). Capacitors are widely used as parts of electrical circuits in many common electrical devices. Capacitors, together with resistors and inductors, belong to the group of “passive components” used in electronic equipment.

Designations such as ceramic or paper capacitors refer to the material of the dielectric; i.e., ceramic or paper.

Hydraulic Compressors

Hydraulic compressors were often contaminated when they were serviced using PCB-contaminated hydraulic fluid. In many cases, there is contamination that can be detected on the outside of the compressor where oil leaked and accumulated dirt over time.

Oil Filled Pumps and Motors

Oil filled pumps and motors are not as common as other PCB equipment and can usually be identified as PCB waste by virtue of the fact that they were specifically designed and fabricated for PCB. Each piece of old equipment (prior to 1980) should be sampled for PCB.

Waste Ballast, Liquid Filled Cable and Oil Circuit Breakers

Light ballasts are commonly used in fluorescent lamps to assist light start and limit the amount of current in an electric circuit. Liquid filled cable or fluid-filled cables have been used in power lines at extra high-voltage distribution networks. Oil circuit breakers are typically found in outdoor substations with mineral oil transformers. They may be mixed with waste electrical and electronic equipment (WEEE) or other municipal solid wastes and go unnoticed when conducting a PCB investigation.

Waste Oil, Paints and Solvents

Waste oil, paints and solvents often get mixed with other oil and solvents that contain PCB, especially heat transfer fluids, hydraulic fluids, lubricating oil and re-used oil. It is common for municipalities to inherit several drums of PCB contaminated paint and paint sludge. Those stored oil and solvents may be released into the workplace or environment through a number of different ways including, leaks, spills, over-filling, accidental damage, fires, and vandalism.

The list of equipment containing PCB is shown below in Table 4. The equipment is divided into the three groups as listed in Annex A (left column). The functionality describes the PCB use and the right column provides indicative examples, whereby most of them were taken from the UNEP/PEN report (UNEP, 2016b) Table 2-3)).

Table 4: Equipment containing PCB according to application and location

Equipment	PCB functionality	Examples
Transformers	Dielectric fluid	Large: industrial facilities, public buildings, hospitals, hotels
		Small: railroad vehicles, vessels; dental offices
Capacitors	Dielectric fluid	Large: Power factor correction capacitors; Fixed paper capacitors for motors, capacitors for direct currents, for accumulation of electricity
		Small: Motor start capacitors, light ballasts and capacitor for fluorescent lights and mercury lamps; Household electrical appliances, such as air-conditioners, washing machines, monochrome television sets, and microwave ovens
Other receptacles	Dielectric fluid	High voltage switches, circuit breakers, voltage regulators, liquid filled electrical cables
	Hydraulic fluids	Hydraulic fluids as heat medium (heating and cooling in mining equipment; aluminum, copper, steel, and iron industries
	Heat transfer fluids	As heating and cooling agent in various chemical, food and synthetic resin industry. Preheating agent of the fuel oil of vessels, central heating systems, and panel heaters
	Lubricating oil	In vacuum pumps, electronic components manufacture; laboratory, instrument and research applications; and waste water discharge sites

5.2 PCB data collection methodology

The methodological approach for data and information collection consisted of five components:

(i) desk reviews of legal framework and available data base;

(ii) questionnaire based surveys (inc. PCB inventory form – annex nr. 1 to PCB Regulation nr. 81/2009);

(iii) field visits to main PCB equipment owners/ stakeholders;

(iv) cross checking interviews with state and private stakeholders; and

(v) an expert assumption for some uncertain data.

Table 5: Data collection approached used for PCB inventory 2020

Data collected using "bottom-up" methodology from the state companies or private sector			
Entities mane	***Activity Data***	***QA/QC*** *(site visits /phone call/)*	***Remarks*** *Links / web site*
ÎCS Premier Energy SRL	Data on PCB containing capacitors and transformers, phase out and management Data on treatment of cross arms and utility poles with PCP and PCN	Site visits to multiple locations Official letter no 14-07/4335 of 22.09.2020 Official replies received Letter no 46-74/1498 of 03.11.2020	Energy distribution company https://premierenergy.md/
Red Nord SE			Energy distribution company https://rednord.md
Moldelectrica SE			Energy transmission company https://www.moldelectrica.md/ro/
Moldtelecom SE			Telecommunication company https://unite.md/
Termolelctrica SE			Heat and power supply company https://www.termoelectrica.md
CET Nord SE			Heat and power supply company https://www.cet-nord.md/ro/
IS Calea Ferată (Railway)	Data on PCB containing capacitors and transformers, phase out and management Data on treatment of railway sleepers with PCP and PCN	Site visit Official letter no 14-07/4373 of 23.09.2020 Official reply Pending	Railway transport administration http://www.railway.md/
ME Regia Transport Electric	Data on PCB containing capacitors and transformers, phase out and management Data on treatment of utility poles with PCP and PCN	Official letter no 14-07/4373 of 23.09.2020 Official reply – letter no 070/924 of 27.10.2020	Electric transport administration www.rtec.md

Moldovatransgaz SE	Data on PCB containing capacitors and transformers, phase out and management	Official letter no 14-07/4373 of 23.09.2020 Official reply – letter no 15-930/5 nov 2020	Gas distribution company https://moldovatransgaz.md/
IS Nodul Hidrotehnic Costesti (HPP)	Data on PCB containing capacitors and transformers, phase out and management	Official letter no 14-07/4373 of 23.09.2020 Site visit	Hydropower plant
Moara SA	Data on PCB containing capacitors and transformers, phase out and management	Official letter no 14-07/4373 of 23.09.2020 Site visit	Milling company
Tracom SA	Data on PCB containing capacitors and transformers, phase out and management	Official letter no 14-07/4373 of 23.09.2020 Official reply – letter no 40/352/ 29 oct 2020	Former tractor production company, now – economic free zone https://tracom.md/ru/
Apă Canal Chisinau	Data on PCB containing capacitors and transformers, phase out and management	Official letter no 14-07/4373 of 23.09.2020 Official reply – letter no 01-3252 din 23 oct 2020	Water supply and sanitation company https://acc.md/
Orange SA	Data on PCB containing capacitors and transformers, phase out and management	Official letter no 14-07/4373 of 23.09.2020 Official reply – letter no 10258 of 30.10.2020	Telecommunication company https://www.orange.md/

5.3 PCB holders subject of assessment

The major holders and industries with potentially significant amounts of PCB equipment are power supply entities shown in Table below. Electric companies and relevant departments of electricity generation and distribution are the most important PCB holders, since the bulk of PCB can be found in capacitors and transformers in the power distribution network.

Sector-specific investigations could be a further subject a critical element for the PCB inventory preparation and management.

Non-formal sector hasn't been included in the PCB assessment.

Table 6: Major PCB equipment holders and industries in the Republic of Moldova

Possible target industries	Common PCB-containing applications	Industries
Electric power stations and distribution stations	Transformers Large capacitors Small capacitors Switches Voltage regulators Liquid filled electrical cables Circuit breakers	IS Modlelectrica ICS Premier Energy (former Union Fenosa) SA Red-Nord (including formed Red-Nord Vest) I.S. Nodul Hidroenergetic Costesti Termoelectrica
Industrial Facilities (including mining, aluminum, copper, iron and steel, cement, chemicals, plastics, synthetics, and petroleum refining industries)	Transformers Large capacitors Small capacitors Heat transfer fluids Hydraulic fluids (equipment) Voltage regulators Circuit breakers Lighting ballasts Heat transfer fluids Vacuum pumps Lubricating oil	Industries holders of such equipment

Possible target industries	Common PCB-containing applications	Industries
Railroad systems	Transformers Large capacitors Voltage regulators Circuit breakers Vacuum pumps Lubricating oil	Calea Ferata Moldova
Military installations	Transformers Large capacitors Small capacitors Circuit breakers Voltage regulators Hydraulic fluids (equipment)	Airport Marculesti
Electronics and mechanical manufacturing and maintenance plants	Transformers Switches Voltage regulators Circuit breakers Vacuum pumps Lighting ballasts Small capacitors	Not identified

Possible target industries	Common PCB-containing applications	Industries
Research laboratories	Vacuum pumps Fluorescent light ballasts Small capacitors Circuit breakers	
Waste water discharge facilities	Vacuum pumps Well motors	Apa Canal enterprises
Automobile service stations	Re-used oil Vacuum pumps	
Waste recycling and recovery plants and sites	Decommissioned equipment Small capacitors (in washing machines, hair dryers, neon tubes, dishwashers, power supply units, etc.) Circuit breakers Lighting ballasts Building demolition Fluff Spills	ABS recycling - Chisinau / Peresecina FinPlast recycling – Balti

6

PCB inventory results

During performing of this assignment around 20 sites visits have been conducted to the main PCBs containing equipment holders such as Moldelectrica, Premier Energy (energy distributor), Red Nord, Termoelectrica , Calea Ferata/ Railroad. Also the review and visits to selected enterprises, reporting large PCB containing equipment was undertaken (Regia Transport Electric, Moldovatransgaz, Orange Moldova, Moara SA, Apa Canal Balti, Apa Canal Chisinau, etc)

The key sector concerned with the PCB is the **energy supply and distribution sector, thermal supply company and the transportation sectors.**

The focus of site visits to the companies, related to PCB generally included the following aspects:

- Verification of the results of previously conducted PCB inventory by MARDE 2010)
- Checking the present of the PCB contaminated equipment
- Checking for proper labelling of PCB equipment
- Discussing with the company representatives the procedure of organizing of the inventory of PCB inventory by the company
- Discussing the company plan on gradual phasing out of the PCB contaminated equipment
- Compliance of the company with the provisions of PCB regulation (Gov Decision nr. 81/2002)

6.1 PCB data available within power supply companies

As a result of assessment the following summary data has been collected for energy sector:

Table 7: PCB inventory data within the power supply and distribution sector, 2020

Name of Company	PCB contaminated equipment, in units	PCB contaminate oil, in tons
ICS Premier Energy	14 units (circuit breakers 35Kv)	3,535
Moldelectrica	161 (circuit breakers and transformers)	47,526
RedNord	3 (transformers)	0,641
Nodul Hidroenergetic Costesti	13 (12 circuit breakers (630/A/110kV, 1 racord)	32,450
TOTAL	**191**	84,152

The detailed description of each company portfolio is presented below:

ÎCS PREMIER ENERGY SRL

ÎCS PREMIER ENERGY SRL is the largest electricity supplier in the Republic of Moldova. The company serves an area of about 70% of the country›s territory, in 21 of the 37 districts, including the municipality of Chisinau, distributing electricity to more than 900,000 consumers in the Center and South of the country. Private operator of the national electricity distribution system in the Republic of Moldova has a vast European experience, nearly two decades in the field of electricity, implementing the best management practices and European standards and investing over 287 million Euro in modernizing and expanding the networks to improve efficiency and increase the quality of services. Quantities of the PCB equipment reported in 2010 inventory revealed relatively small amounts of remaining PCB containing equipment. Repeated tests on PCB contents were performed by the company during 2015-2018. that in 2019 the company announced the tender and the Romanian Company Setcar was contracted to perform the works for PCB equipment containing oil dismantling and transportation for further treatment. The equipment was stored properly within the company premises, oil expecting to be transported to Germany. Due to COVID situation the procedure of receiving the signed agreements from competent authorities of transit countries, according to Basel Convention procedures is still in process, expected to be finalized by the end of 2020.

The summary of the equipment present within the company include switches 35kV (A, B, C phases) The summary of the visits is reflected under the **Site Visit Forms PCB/1 -PCB/3 dated 22.11.2020**

The visit was conducted to centralized deposit of the company, there the repackaged PCB containing oil is being kept prior to its transportation to Germany for final treatment. As well the remaining PCB equipment storage was also checked.

Figure 2: Visits to Premier Energy central storage of contaminated equipment and repackaged oil in Vatra , Cricova and Bujor - October 2020

Table 8: Inventory on PCB contaminated equipment at ÎCS PREMIER ENERGY SRL

Company	Equipment type	Date of production	Oil mass, kg	Type of oil	Operational status of equipment	Mode of storage	PDB Contents (according to express tests), ppm	PCB convents (chromatography), mg/kg
Premier Energy Distribution	Switch 35 kV	1978	130	dielectric	In function	outside	434	322.97
			130				701	389.87
Premier Energy Distribution	Switch 35 kV	1985	130	dielectric	In function	outside	85.9	57.99
			130				222	168.95
			130				94.2	66.67
Premier Energy Distribution	Switch 35 kV	1986	130	dielectric	In function	outside	113	113
Premier Energy Distribution	Switch 35 kV	1981	130	dielectric	In function	outside	277	206.24
			130				267	176.24
Premier Energy Distribution	Switch 35 kV	1981	220	dielectric	In function	outside	138	115.2
			220				147	96.05
			220				136	101.57
Premier Energy Distribution	Switch 35 kV	1983	200	dielectric	In function	outside	247	155.32
			200				207	177.66
			200				132	81.45
Premier Energy Distribution	Switch 35 kV	1980	130	dielectric	Out of function	depozit	164	77.73
			130				156	75.92
Premier Energy Distribution	Switch 35	1977	130	dielectric	In function	outside	78.4	51.53
			130				90	60.3
			130				77.3	58.67

Premier Energy Distribution	Switch 35	1977	130	dielectric	In function	outside	89.9	74.47
			130				85.5	74.1
			130				96.6	71.86
Premier Energy Distribution	Switch 35	1987	130	dielectric	In function	outside	82	59.31
			130				80.5	70.26
Premier Energy Distribution	Switch 35	1989	130	dielectric	In function	outside	124	68.05
			130				108	97.96
Premier Energy Distribution	Switch 35	1989	130	dielectric	In function	outside	74.2	60.55
			130				82.8	54.68
Premier Energy Distribution	Switch 35	1974	130	dielectric	In function	outside	350	138.93
Premier Energy Distribution	Switch 35	1979	130	dielectric	In function	outside	98.4	89.87
			130				82.2	65.63
			130				80.4	56.2
Premier Energy Distribution			aprx. 10 000	dielectric		depozit	Mixture of oils with various concentrations	Mixture of oils with various concentrations

Summary data for ICS Premier Energy

Type of PCB contaminated equipment	Quantity of PCB oil	Status
Circuit Breakers 35kV	4640	Equipment in use

10.000 tons of dielectric oil has been repackaged and pending the disposal by Setcar Company in 2021.

Company has the plan on remaining PCB equipment elimination up to 2022, yet the tariff shall be approved by ANRE.

MOLDELECTRICA

Moldelectrica, is a state owned company specialized in the centralization of transport services and operational dispatching of the energy system of the Republic of Moldova. Within its activity, the Transmission System Operator is responsible for two main groups of tasks:

- electricity transmission;
- implementation of a single operational-technological management of the energy system of the Republic of Moldova.

The state enterprise "Moldelectrica" was founded by the Government Decision of the Republic of Moldova no.1000 of October 2, 2000 "On the creation of state enterprises in the power sector" and the order of the Ministry of Industry and Energy no.92 of October 19, 2000 by separating assets corresponding functions of the State Enterprise "Moldtranselectro".

The enterprise has the status of a legal entity and was registered at the State Registration Chamber under the Ministry of Justice of the Republic of Moldova on October 26, 2000 with no. 102105264, a fact confirmed by the issuance of the A series certificate no. 155763.The state body that holds the powers of owner of the state assets of the enterprise and of Founder of the enterprise is the Ministry of Economy of the Republic of Moldova.

In 2009, within the GEF project Management and destruction of stocks of persistent organic pollutants 934 tons of equipment with PCB content (of which oil - approx. 220 tons) was eliminated. The amount of PCB removed includes 18,660 PCB electric capacitors dismantled from 13 transformer stations of the SI "Moldelectrica".

All the visits were organized by experts accompanied by the Moldelectrica Staff and coordinated with **Nelly Melnicenco, chief environmental engineer** of the IS Moldelectrica. **See Site Visit Forms (PCB/04 – PCB/08)**

Figure 3: Visits to SI Moldelectrica November, 2020

According to official answer of Moldelectrica to MARDE (letter nr. 46-74/1386 date 8.10.2020), there are **161 equipment units present, potentially contaminated with PCB, of the total quantity of 47,526 tons**. Majority of the equipment are circuit breakers (with oil amount of 250 kg). Estimated amount of PCB contaminated oil (tested only in 2010) is 60 tons. The overview of type of equipment is presented in Figure below.

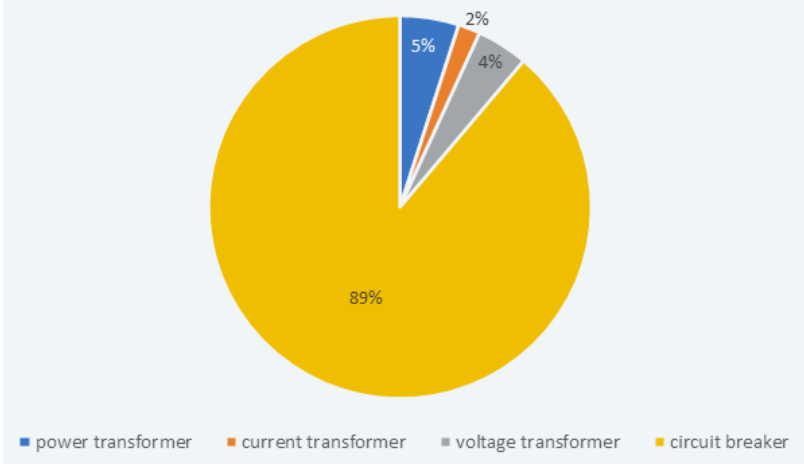


Figure 4: Type of PCB contaminated equipment at IS Moldelectrica

SA RED NORD

Is the state energy distribution company, funded in 1962 operating in the north and north western region of country . The enterprise is the second largest network operator in the territory of the Republic of Moldova. The distribution of electricity is carried out at regulated tariffs, in conditions of availability, continuity, transparency, in compliance with the norms of quality, security and environmental protection. Red Nord SA was checked for some type of equipment the 35kV switches and some transformers. The **Site Visit Forms PCB/1 -PCB/3 dated 22.11.2020**

Red – Nord has reported several PCB contaminated equipment units, located in the north-vest part of the country.

Figure 5: Visit to Red Nord company equipment in Nimereuca, Soroca, 5 November, 2020

According to official answer of "Retele Electrice de distributie Nord" to MARDE (letter nradm12/1577 dated 29.12.2020), there are **3 transformers with PCB**, that were dismantled and stored currently at enterprises' premises. The total amount of reported **PCB oil is 641kg**.

State Enterprise Nodul Hidro Energetic Costesti

State Enterprise Nodul Hidro Energetic Costesti, Riscani district is the state owned company, that is strategic object for country's economy, produces electricity and mitigates floods. The hydropower plant building is located on the territory of two states: the Republic of Moldova and Romania. Construction of the hydropower plant began in 1973 and was completed in 1978. The hydropower plant was put into operation on June 28, 1978 and constantly generates electricity.

The electrical part of the hydropower plant consists of two power transformers, two bar sections and a bypass bar, МКП-110 type circuit breakers, НКФ-110 voltage transformers, separators and others. There are also two type distribution installations: КРУН-10 and КРУ-10.

SHS has one type PCB containing equipment – **12 circuit breakers (630/A/110kV),** produced and installed in 1976 and that are still in function. Also the reserve of oil, that could potentially contain the PCB is estimated at **16200 kg.** The sampling of PCB oil was done in 2009, no further investigation was made. The status of the switches is good, the company takes regular maintenance works. At the moment no big investment projects are envisaged, that would include the replacement the present equipment. Being a state owned company, the company fully depends on the allocation from state budget, that for upcoming years doesn't include new procurements.

Figure 6. Visit to State Enterprise Nodul Hidro Energetic Costesti - 13 November, 2020

6.2 Thermal supply sector

The thermal supply sector within the country is represented by several companies, located around the country. The subject of present review was:

- State Enterprise Termoelectrica, Chisinau;
- State enterprise CET Nord.

State Enterprise TERMOELECTRICA

The Joint Stock Company "Termoelectrica" is the main producer and supplier of electricity and heat in Chisinau and its suburbs. The object of activity of the enterprise aims at:

- electricity production;

- production, transportation and distribution of thermal energy to consumers, municipal housing fund organizations, state institutions, budgetary / social-cultural institutions, economic agents, etc.

The company has an important system of thermal energy installations and experience in the field of district heating, in which it holds the lead, being the only company specialized in remote centralized transport of thermal energy and domestic hot water, for consumers in Chisinau and its suburbs. The company services 5678 buildings with thermal energy, including 594 budgetary institutions, 814 economic agents, 339 private houses. 208,702 apartments located in 3,931 residential blocks in the municipality; and deliver annually to consumers about 1,370 thousand Gcal of thermal energy for heating.

The company is also potential holder of of PCB contaminated equipment. The first PCB analysis were done individually by the company back in 2005, next, in 2009-2010, being a part of national PCB inventory additional sampling was made for the PCB contents within the transformers. The visit was organize to one of the branch of the Termoelectrica, where the biggest transformer are located. During the visit the equipment was checked. Visits were accompanied chief energy engineer and Oxana Kantidailova, chief environmental engineer.

Figure 7. Visit to State Enterprise Termoelectrica – Chișinău, November 2020

6.3 Transport sector

Calea Ferata – Railroad of Moldova

Calea Ferată din Moldova (abbreviated as CFM) is the sole railway operator in the Republic of Moldova, responsible for passenger and cargo transportation, as well as railway infrastructure maintenance within the country. The total length of the network managed by CFM (as of 2009) is 1,232 kilometres (766 mi), of which 1,218 kilometres (757 mi) are 1,520 mm (4 ft 11 27⁄32 in) (broad gauge), and 14 kilometres (8.7 mi) are 1,435 mm (4 ft 8 1⁄2 in) (standard gauge). The entire network is single track *and is not* electrified. It borders the Romanian railway network, with a 1,520 mm (4 ft 11 27⁄32 in)/1,435 mm (4 ft 8 1⁄2 in) break-of-gauge *in the west, and the* Ukrainian one *in the east.*

Calea Ferată din Moldova (literally "Railway of Moldova" in Romanian) came into existence in 1991 as the successor to the former Railway system of the Soviet Union.

During the national PCB inventory held in 2009-2010, the company, as the largest holder of the mainly small-size potential PCB equipment has been checked for PCB contents. As a result, it was revealed that approximately 70 units were determined as exceeding 50ppm. Most of the equipment from the list is still in use, for several reasons: good conditions and lack of finance to replace it. The particularities of the placement of the PCB equipment is that it is all spread around the country, so for the purpose of inspection the experts team has checked for the main nodes: Balti in the north, Ungheni/ Sculeni in the center, Iargara (in the south). At this points the main storage of equipment is located. The biggest transformers are also kept in Chisinau node. The company hasn't provided the updated information, so the data from 2009 was used for the present inventory. **Thus, there are of total 75 various transformers and other equipment present, with an estimated oil mass of 2940 kg.**

Figure 8. Visit to State Enterprise Calea Ferată – Bălți, 27 October, 2020

6.4 Other business

Besides big state owned companies, that have the PCB containing equipment, there are also numerous final consumers/ business spread around the country that have the transformers that generate the energy for the internal use, but also being delivered by subcontracted entities. Among these companies, for the purpose of the present fact finding meeting the following companies were selected: Moldovatransgaz, Orange Moldova, Moara SA, Apa Canal (water supply company) Balti, Apa Canal Chisinau, Regia Transport Electric, Tracom SA. Some of the companies are located in Chisinau, others have branch offices around the country. Selected pool of the business was visited, the following aspects were verified: presence and proper labelling of the equipment, filled in inventory forms, transformers state (leakage, storage, frequency of refilling of the oil, company plans for equipment phase out in compliance with stages mentioned in Art 7 of the PCB regulation nr. 81/2002)

Figure 9. Visit to Moara SA – Bălți, 18 November, 2020

Figure 10. Visit to Apa Canal Balti

Figure 11. Moldovatransgaz SA , PCB containing oil storage in Drochia,

7

PCB inventory in transnistrian region

For the purpose of the present inventory, the project has well studied the available information and some of research data for PCB equipment in the so-called transnistrian region, that is an unrecognised breakaway state *that is internationally recognised as a part of* Moldova. Transnistria controls most of the narrow strip of land between the Dniester *river and the* Moldovan–Ukrainian border, as well as some land on the other side of the river's bank. Transnistria is officially designated by the Republic of Moldova as the Administrative-Territorial Units of the Left Bank of the Dniester *(*Romanian: Unitățile Administrativ-Teritoriale din stînga Nistrului)[1] .

The region faces many ecological problems. Besides the obsolete pesticides, municipal waste, water and air pollution, there is the problem of old capacitors, which haven't been used since the 1990s and which contain dangerous chemicals such as polychlorinated biphenyls (PCBs).

Under the OSCE mission to Moldova and with the support of the Ministry of Environment, at the request of the SUE Dnestrenergo (TN power supply company), an inventory of seven electrical substations from Bender, Grigoriopol, Hirtop, Dubasari, Ribnita (two) and Camenca was carried out in 2019 on the subject of PCB presence.

The inventory consisted in physical checking of capacitors by collecting information on: ownership of PCBs equipment, location, weight, size, production date, manufacturer, leakage and contamination information, pictures of the PCB equipment.

As a result of the inventory, 2,194 capacitors were detected. The estimated quantity of PCBs oil is 43,740.00 kg with a total capacitors amount of 111,273.00 kg.

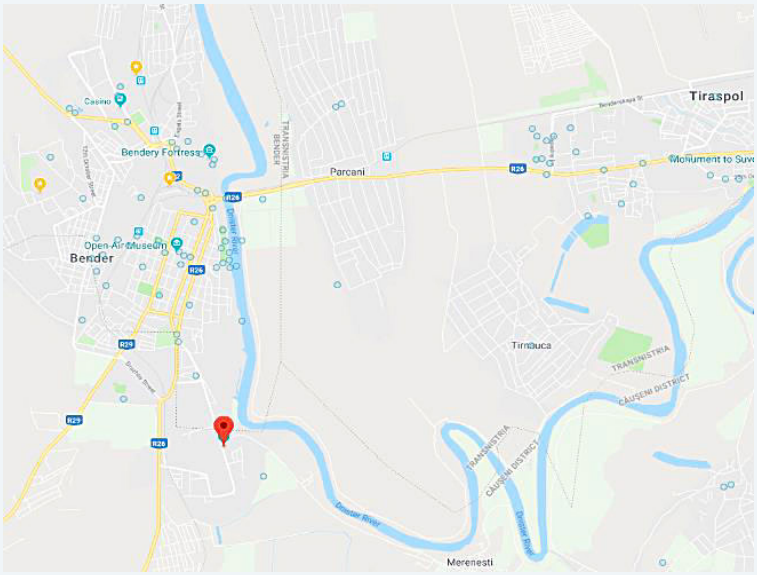
PCBs leakage leads to air, soil, and groundwater pollution in case of waste penetration in deeper soil layers.

The worst situation was found in **Bender**, where capacitors were on the surface of the soil and about 30% of the capacitors had obvious signs of leakage. The effect of PCBs on the environment can be noticed at the Hirtop electrical substation, where the chestnut trees dried out and withered due to the immediate vicinity of the platform which holds the capacitors. The case study for this specific location is presented below.

1 http://lex.justice.md/viewdoc.php?action=view&view=doc&id=313004&lang=1

Yet, additional investigations must be undertaken for this specific region. The assumption of Moldovan power supply companies, that within the region there were 1/3 of the quantities of MD part equipment.

Table 9: Electrical substation Bender, SUE Dnestrenergo site and PCB data

SITE INFORMATION	
Country: *Republic of Moldova, Transdnistria*	**Site name:** *Electrical substation, Bender*
GPS coordinates:	
Latitude (N):	*46°47'35"*
Longitude (E):	*29°29'26"*
Altitude (m):	*45 m*
	
Address:	*Industriala str., 85a, Bender*
Name of nearest settlement to the site:	*Bender*
Its distance to the site (km):	*0 km*
Services:	

Electricity supply (in store and at site)	*Yes*	Comments: *There is available space for equipment, empty drums, tools, repacking procedures and repacked drums.* *The site is guarded.*
Lighting (in store and at site)	*Yes*	
Water supply (in store and at site)	*Yes*	
Washing and toilet facilities on site	*Yes*	
Cell phone networks and signal strength	*Moldavian mobile network - good*	

SITE PLAN

Road surface and features:	*The road is accessible for transport. The surface is from asphalt*	**Distance from main road (km):**	*0,05 km*

Seasons when road is impassible (months and reasons): *The road is accessible*

Site plan:

The site is a 12,000 m^2 area. All capacitors are located at 50 m from entrance on a 52 m^2 area.

Description of the waste

Two types of capacitors were deposited at the site. All the capacitors were located directly on the soil, and were fixed to some frames. The capacitors were never used. The capacitors are in bad condition and leaks contaminate the surface of the soil on which they are stored. Capacitors passports were not available.

a. Capacitors of Type 1: КСП-*0,66-40УІ.* Produced in 1975 at Ust-Kamenogorsk (Kazakhstan). (Fig.1)

Figure: 12. Nameplates of capacitors type КСП-0,66-40УІ

b. Capacitors of Type 2: КСІ-*0,66-20-ІУІ.* Produced in 1983 at Ust-Kamenogorsk (Kazakhstan). (Fig 2)

Figure: 13. Nameplates of capacitors type КСІ-0,66-20-ІУІ

Table 10. Total capacitors at Bender electrical substation

	Number of capacitors, pcs	Leaking capacitors, pcs	Volume/pc, m^3	TOTAL volume of capacitors, m^3	Weight PCBs/pc, kg	TOTAL weight of PCBs, kg	Weight/ pc, kg	TOTAL weight, kg
КСП-*0, 66-40УІ*	44	17	0.04	1.76	23	1,012.00	55	2,420.00
КС*І-0, 66-20-ІУІ*	292	74	0.024	7.01	12	3,504.00	30	8,760.00
TOTAL	**336**	**91**		**8.77**		**4,516.00**		**11,180.00**

Pictures from the site






8

PCB Assessment findings & conclusions

The PCB contaminated equipment assessment, conducted in September 2020-January 2021 concluded with the next findings:

8.1 At PCB regulation enforcement level the key points were revealed:

Art. 7 of the PCB regulation: Deadlines for operation of PCB-contaminated equipment:

Finding: most of PCB contaminated equipment holders informed that will not be able to comply with the deadline set in regulation *art. 7 p.2) the use of the equipment, indicated in paragraph 1), with PCB content between 0.005% and 0.05% is allowed until December 31, 2020;*

Possible action:

- *addendum of the regulation and setting the new deadline as per 2025.*
- *requesting the biggest PCB holders to provide with the business plan and calculation of costs for sound storage, treatment and disposal*

Art. 8. Holders of PCBs and equipment containing PCBs must take into account the following restrictions in the application of PCBs:

1. the separation of PCBs from other substances for the purpose of PCB reuse is prohibited;
2. filling the transformers with PCB is forbidden;
3. until the moment of decontamination, decommissioning and / or disposal in accordance with point 12, the maintenance of transformers containing PCBs may continue only for the purpose of ensuring the maintenance of PCBs containing them according to technical standards or dielectric quality specifications and the condition that the transformers are in good technical condition and have no leaks;
4. the equipment used is periodically checked in order to ensure the timely liquidation of leaks;

5. the equipment containing leaking PCBs will be taken out of use and will be managed according to the provisions of point 11;

6. it is forbidden to mix or dilute the liquid containing PCBs, solid PCBs or substances with PCBs with any other substances.

Finding: Some visited / interviewed business operators have pointed out the lack of Internal rulebook on manipulating with the PCB contaminated equipment, based on regulation procedures.

Possible action:

- *elaboration of the template of the rulebook, training of relevant staff on conducting of PCB inventory and management/ manipulation procedures.*

Art. 16. PCB analyzes are performed in accredited laboratories according to the provisions of Law no. 235/2011 on accreditation and conformity assessment activities. When performing the analyzes, the provisions of the Reference Methods for the PCB analysis must be taken into account.

Finding: currently the country lacks the accredited laboratory to perform the PCB analysis, nor at state level (Environmental Agency), neither at private laboratory. The only option on performing the analysis is abroad.

Possible action:

Inclusion of the PCB analysis within the tender documents for PCB contaminated equipment / oil repackaging and disposal.

8.2 PCB inventory form and reporting

PCB equipment inventory form – annex nr. 1 to PCB regulation, PART C: must be complemented with additional information, that currently lacks:

- *For national companies* – authorization number, company name, storage location

- *For transboundary movement* – Notification contents in compliance with Gov. Decision 637/2003 on transboundary movement and disposal of hazardous waste

Reporting

PCB Regulation Art. 9 p. 6) stipulates that *based on the information obtained from the equipment owners, the Environment Agency shall draw up the national inventory of PCB-containing equipment within 12 months of the entry into force of this Regulation. The national inventory must be updated annually.*

Finding: Last national PCB inventory has been done in 2010, no update is registered since then.

Possible action:

Introduction of annual reporting of PCB contaminated equipment (existing quantities and maintenance / disposal activities) under the Waste Management Information System www.siamd.gov.md

8.3 Authorization

The PCB regulation has Art. 17, that stipulates that Authorization is issued by Environmental Agency for activities of *Decontamination and disposal of equipment containing PCBs or used PCBs.*

Finding: in 2020, the Environmental Agency issued authorization on waste management nr. AM20081301 dated 02.09.2020 to SRL "MoldrecGroup"[2] for activities on collection of PCB containing oils, PCB containing equipment and oil storage and transportation.

Possible action:

Since there are no capacities for environmentally sound treatment and disposal of PCB in the Republic of Moldova, the holders of the equipment are suggested to keep it at their premises, respecting the provisions of the PDB regulation, without the transportation or temporary storage transmission to third parties, in order to avoid the accidental contamination. It is also suggested to companies, announcing the tender to include in the technical dossier the full spectrum of services: laboratory analysis, repackaging, transportation, notification procedure in compliance with Basel convention and Gov. Decision nr. 637/2003 on transboundary movement of hazardous waste.

8.4 PCB inventory on closed-use among the consumers

The assessment revealed the need to conduct the inventory of PCB equipment among final consumers, various industries and facilities around the country. The PCB inventory in 2010 included the list of approximately 600 final consumer operators with transformers. However, during the last decade a lot of SMEs were closed, bankrupt or changed the owner and many of the assets, including the equipment could have been sold, disposed or lost.

Possible action:

Implication of the Environmental Protection Inspectorate staff on contacting and controlling the SMEs, potential transformers owners to check for presence of equipment, proper labelling and maintenance, including the plan for disposal.

8.5 PCB inventory on open uses

Open uses of PCB: as pesticide extenders, sealant, carbonless copy paper, industrial oils, paints, adhesives, plastics, flame retardants and to control dust on roads, haven't yet been evaluated in the Republic of Moldova.

Annexes

2 https://doc-14-a0-apps-viewer.googleusercontent.com/viewer/secure/pdf/3nb9bdfcv3e2h2k1cmql0ee9cvc5lole/d0htsr76bdu919arat0jb4mpuh3hr9oh/1611579600000/drive/*/ACFrOgCAOguq4tU6YpnXy2gHHdj5U_H_zSG-SH384n78otf6TJxUvM4jjpehVW90qaQ2wDGSLY6lU4p8ngCpFLYDxXtwypYcT2N44Vz8mB7OArChv17RU0owkGxzTVMMlbjcRVV3TxXKMH5XpZvR?print=true

Annex nr 1: PCB questionnaire (annex to Gov Decision nr 81/2009)

Anexa nr. 1
la Regulamentul privind
bifenilii policloruraţi

Forma de inventariere

Pentru scopurile punctului 9, trebuie să fie utilizată ca bază următoarea formă:

				Numărul de înregistrare:	
				Data:	
				Persoana responsabilă:	
A	**Informaţia privind compania şi amplasarea ei**				
1.	Denumirea companiei:				
2.	Adresa companiei (oficiul central):				
3.	Adresa subdiviziunii: *(alta decît A2)*				
4.	Telefon:				
	Fax:				
	E-mail:				
5.	Numele, prenumele şi funcţia persoanei de contact				
6.	Tipul companiei (producător, transportator, distribuitor)				
7.	Companie de stat sau privată				
8.	Amplasarea		Zona industrială		
		Zona urbană			
		Zona rurală			
9.	Numărul personalului		> 50		
		10-50			
		< 10			

10.	Numărul total de echipament electroener-getic pe teritoriu		Transformatoare			
		Condensatoare				
		Altele				
B	**Informaţia privind echipamentul contaminat cu BPC. Va fi completat pentru fiecare unitate de echipament (în cazul condensatoarelor, pentru fiecare grup de condensatoare de acelaşi tip)**					
1.	Numele producătorului şi ţara de origine					
2.	Tipul echipamentului: *a. Transformator* *b. Condensator* *c. Altul (ex: butoi umplut cu lichid)*					
3.	Numărul (numerele) seriei					
4.	Data fabricării					
5.	Tipodimensiunea (puterea nominală, tensiunea)					
6.	Masa	Masa echipamentului uscat (kg)				
		Ulei/ lichid (L sau kg) inclusiv lichidul, absorbit în elementele de carton, lemn etc.				
		Dimensiunile echipamentului		Înălţimea, m	Lungimea, m	Lăţimea, m
7.	În cazul condensatoarelor: numărul unităţilor de acelaşi tip					
8.	Denumirea lichidului (dacă este cunoscută)					
9.	Conţinutul BPC în lichid	> 10 % BPC				
		> 0.05 % BPC sau 500 ppm				
		> 0.005 % BPC sau 50 ppm				
		< 0.005 % BPC sau 50 ppm				
		Nu sînt BPC (în conformitate cu placa)				
		Conţinutul BPC nu este cunoscut				
		Echipamentul a fost eliberat de lichid				
10.	Analiza BPC efectuată: dacă da, prin ce metodă şi cînd					
11.	Sursa de informaţie referitor la echipamentul electric (placa cu inscripţii etc.)					

12.	Starea operaţională a echipamen-tului: în utilizare / în repaos		În utilizare: da / din data	
		În repaos		
		Scos din uz		
13.	Starea echipamen-tului	Curge		
		Necesită acţiuni urgente		
		Modul de păstrare (în aer liber, închis etc.)		
14.	Operaţiuni referitoare la manage-mentul uleiului		A fost uleiul schimbat / adăugat	
		Dacă da, cînd a avut loc ultima schimbare / adăugare a uleiului		
		Persoana responsabilă de schimbarea / adăugarea uleiului		
		Tipul uleiului schimbat / adăugat		
15.	Data planificată a următoarei acţiuni de deservire tehnică, schimbare / adăugare a uleiului			
16.	Metoda de tratare planificată			
17.	Perioada planificată pentru tratare			
18.	Perioada planificată pentru scoaterea echipamentului din uz (dacă nu este decontaminat)			
19.	Echipamentul a fost marcat (data)			
20.	Alte observaţii			
C	**Informaţia care trebuie introdusă cînd echipamentul a fost transmis unei întreprinderi autorizate pentru gestionarea deşeurilor de BPC**			
1.	Data notificării			
2.	Persoana responsabilă			
3.	Data transmiterii			
4.	Denumirea şi adresa companiei autorizate care preia responsabilitatea pentru echipament			

Annex 2. Inventory of PCB equipment containing by district profile at final consumers on 31.12.2021

Nr. d/o	Raion	PCB equipment owners (number)	PCB containing equipment (pieces)	Operational status of equipment			
				In use	Stand by	Out of use	Mass of oil (in tons)
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1.	mun.Chișinău	54	114	89	18	7	56,2
2.	mun.Bălți	8	8	6	-	2	2,2
3.	mun.Cahul	9	9	5	1	3	3,4
4.	mun.Comrat	10	11	8	1	2	3,8
5.	Anenii Noi						
6.	Basarabeasca	3	3	2		1	1,1
7.	Briceni	1	1	1	-	-	0,07
8.	Cantemir	1	1	1	-	-	0.07
9.	Cimișlia	3	3	3	-	-	0,9
10.	Criuleni	14	18	12	4	2	3,6
11.	Călărași	2	3	2	1	-	1,2
12.	Ceadîr Lunga	4	7	1	-	6	3,2
13.	Căușeni	10	12	9	2	1	3,1
14.	Dondușeni	1	1	1	-	-	0,02
15.	Drochia	1	1	1	-	-	0,003
16.	Dubăsari	3	3	3	-	-	0,7
17.	Fălești	11	11	10	1	-	2,5
18.	Florești	4	6	2	4	-	1,7

Nr. d/o	Raion	PCB equipment owners (number)	PCB containing equipment (pieces)	Operational status of equipment			
				In use	Stand by	Out of use	Mass of oil (in tons)
19.	Edineț	7	8	6	2	-	1,8
20.	Glodeni	1	1	1	-	-	0,001
21.	mun.Hîncești	6	5	3	2	1	0,9
22.	Ialoveni	1	1	1	-	-	0,2
23.	Leova	3	3	3	-	-	0,2
24.	Nisporeni	4	4	4	-	-	0,8
25.	Ocnița						
26.	mun.Orhei	14	14	13	1	-	3,5
27.	Rezina	3	3	3	-	-	0,8
28.	Rîșcani	5	5	3	2	-	0,7
29.	Ștefan Vodă	3	4	3	-	1	1,9
30.	Sîngerei	5	6	2	4	-	4,6
31.	mun.Soroca	9	9	7	2	-	1,6
32.	mun.Strășeni	10	10	5	5	-	1,9
33.	Șoldănești	1	1	-	1	-	0,2
34.	Taraclia	6	6	5	-	1	2
35.	Telenești	7	9	7	2	-	2,5
36.	mun.Ungheni	3	3	3	-	-	0,4
37.	Vulcănești	2	3	1	-	2	0,76
	TOTAL	**229**	**307**	**226**	**53**	**29**	**108,524**

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