Polychlorinated Biphenyls (PCBs) Phasing-Out Regulation in Indonesia

Final Report (Updated)

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Foreword

The authors would like to thank The Indonesian Ministry of Environment and Forestry (MoEF), the United Nations Industrial Development Organization, the Global Environmental Fund and other parties involved in the drafting of this report. Originally the final report was submitted on 16 September 2016. However, due to regulatory and information changes over the time we updated the report to keep it accurate.

This report consists of the main report and 6 (six) annexes:

- Annex 1 Recommendation for Regulatory Reform
- Annex 2 Existing Regulatory Framework
- Annex 3 PCB Official Guidance
- Annex 4 PCB Code of Practice (by Dr. Carlo Lupi)
- Annex 5 Analysis of Task, Role and Function of MoEF Units in PCB Phasing Out
- Annex 6 Recommendation for the Regulation of Economic Incentives

Annex 3, PCB Official Guidance, is drafted as *version 1.0*. as at the time of writing several legislations are in the process of drafting. Future versions of the PCB Official Guidance can accommodate these draft legislations, should they be enacted. Annex should be read in conjunction with Annex 4, PCB Technical Code of Practice (drafted by Dr. Carlo Lupi). The main report contains more detail than the PCB Official Guidance. The Government may choose to include materials from the main report into the PCB Official Guidance if considered relevant.

Other deliverables such as Chapter 6 (institutional arrangements, further elaborated in Annex 5) and the legal analysis for thermal versus non-thermal PCB Disposal Technologies (discussed briefly in section 4.11 – but the analysis document is not included here and delivered separately to the MoEF) is not required by our Terms of Reference but nevertheless essential to support the PCB phasing out program in general.

Bogor, 23 January 2018

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1. International Conventions on PCB and its implementation in Indonesia

1.1. Basel Convention

Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal (1989) ("Basel Convention") aims to reduce the movement of hazardous wastes, minimize the hazardous wastes production, ensure the environmentally sound manner of waste disposal as close to the possible source as possible and assists developing country in the environmentally sound of hazardous waste management that they generate1. The Convention covers toxic, poisonous, explosive, corrosive, flammable, ecotoxic and infectious wastes that are being moved from one country to another (transboundary movements). In 1995, the Ban Amendment was introduced in order to strengthen the Convention. It prohibits the export of hazardous waste, for any reason, from an OECD member state to non-OECD countries. In addition, in 1999, a protocol on liability and compensation was adopted.

In terms of PCBs, the Annex of the Convention specifically regulates the PCBs as follows:

Basel Convention Annexes Related to PCBs

Annex I: Categories of Waste to Be Controlled (Waste Streams)	Y10	Waste substance and articles containing or contaminated with PCBs and/or Polychlorinated terphenyls (PCTs) and/or Polybrominated biphenyls (PBBs).
Annex VIII, List A A1. Metal and Metal-Bearing Waste	A1180	Electrical waste and electronic assemblies or scarp (e-waste) containing components such as accumulators and other batteries included on list A, mercury-switches, glass from cathode-ray tubes and other activated glass and PCBs capacitors, or contaminated with Annex I constituents (e.g. cadmium, mercury lead, polychlorinated biphenyl) to an extent that they possess any of the characteristics contained in Annex III (note the related entry on list B B1110)[2]
	A1190	Waste metal cables coated or insulated with plastics containing or contaminated with col tar, PCB [3], lead, cadmium, other organohalogen compounds or other Annex I constituents to an extent that they exhibit Annex III characteristics.
Annex VIII, List A	A3180	**Waste substances and articles containing, consisting of or contaminated with polychlorinated biphenyl (PCB),**

[1] Chemical Convention Handbook, http://www.ntn.org.au/cchandbook/basel/desc_sc3.html
[2] PCBs are at a concentration level of 50 mg/kg or more
[3] Ibid

A3. Waste Containing Principally Organic Constituents, Which May Contain Metals and Inorganic Materials		polychlorinated terphenyl (PCT), polychlorinated naphthalene (PCN) or polybrominated biphenyl (PBB), or any other polybrominated analogues of these compounds, at a concentration level of 50 mg/kg or more[4].

The Basel Convention defines PCBs as any material or substance containing a PCB concentration more than 50 ppm. Furthermore, unidentified appliances must be alleged to be PCB-containing while awaiting their identification by screening or laboratory analysis[5]. This definition is important as it includes[6]:

- Transformers insulated with PCBs;
- Mineral oil transformers containing PCBs with a concentration of above 50 mg/kg;
- Capacitors;
- Power switches;
- Power distribution units;
- Insulators in very high voltage distribution stations;
- Used oils containing PCBs with a concentration of above 50 mg/kg;
- Magnetic circuit cleaning solvents;
- Contaminated solids such as rags, gloves, boots. A specific attention should be given to mineral oil transformers.

Indonesia has ratified the Convention through Presidential Decree No. 61/1993 on Basel Convention Ratification and the Presidential Regulation No. 47/2005 on the Ratification of the Amendment of Basel Convention.

1.2. Stockholm Convention

The Convention on Persistent Organic Pollutants (POPs), known as Stockholm Convention, was adopted in 2001 and entered into force in 2004. The purpose of the convention is to restrict and eventually prohibit the production, use, emission, import and export of persistent organic pollutants (POPs)[7]. Twelve initial chemicals, known as the 'poison without passport' or dirty dozen were initially identified by the convention for eventual elimination. Different catrgories of POPs listed in the convention is as follows:

[4] The 50 mg/kg level is considered to be an internationally practical level for all wastes. However, many individual countries have established lower regulatory levels (e.g. 20 mg/kg) for specific wastes.
[5] Preparation of a National Environmentally Sound Management Plan for PCBs and PCB-Contaminated Equipment, UNEP, B.C, 2003
[6] Ibid
[7] http://cchandbook.ntn.org.au/pops/obli_sc2.html#go

Categories of POPs Based on Stockholm Convention[8]

Annex A Chemicals for Elimination	Annex B Chemicals for Restricted Use	Annex C Chemicals which are Unintentionally Produced[9]
Aldrin	Dichloro Diphenyl Trichloroethane (DDT)	Polychlorinated dibenzo-p-dioxins (PCDD)
Chlordane	Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonlyl fluoride	Dibenzofurans (PCDF)
Chlordecone	-	Hexachlorbenzene
Dieldrin	-	Hexachlorobutadiene (HCBD)
Decabromodiphenyl ether (commercial mixture, c-decaBDE)	-	Pentachlorobenzena
Endrin	-	Polychlorinated Biphenyls (PCBs)
Heptachlor	-	Polychlorinated dibenzo-p-dioxins (PCDD)
Hexabrombiphenyl	-	Polychlorinated dibenzofurans (PCDF)
Hexabromocyclododecane (HBCDD)	-	Polychlorinated napthalenes
Hexabromodiphenyl ether and heptabromodiphenyl ether (commercial octabromodiphenyl ether)	-	-
Hexachlorobenzene (HCB)	-	-
Hexachlorobutadiene	-	-
Alpha hexachlorocyclohexane	-	-
Beta hexachlorocyclohexane	-	-
Lindane	-	-
Mirex	-	-
Pentachlorobenzene	-	-
Pentachlorophenol and its salts and esters	-	-
Polychlorinated Biphenyls (PCB)	-	-
Polychlorinated napthalenes	-	-
Short-chain chlorinated parffins (SCCPs)	-	-
Technical endosulfan and its related isomers	-	-

[8] Based on the recent list of POPs in the Convention, see: http://chm.pops.int/TheConvention/ThePOPs/TheNewPOPs/tabid/2511/Default.aspx

[9] Actions should be taken to reduce and eventually eliminate releases the chemicals under this Annex

Tetrabromoduphenyl ether and pentabromodiphenyl ether	-	-
Toxaphene	-	-

In terms of PCBs the Convention mandates the parties to take action as follows:

Annex A, Part II

The parties shall take action by 2015, with priorities:

- make determined efforts to identify, label and remove from use equipment containing greater than 10 % polychlorinated biphenyls and volumes greater than 5 litres
- make determined efforts to identify, label and remove from use equipment containing greater than 0.05% polychlorinated and volumes greater than 5 litres;
- ***endeavour*** to identify and remove from use equipment containing greater than 0.005 per cent polychlorinated biphenyls and volumes greater than 0.05 litres;
- promote the following measures to reduce exposures and risk to control the use of PCBs by using only intact, non-leaking equipment, not use around food or feed areas, and when it is used in populated areas, all reasonable measures to protect from electrical failure which could result in a fire and regular inspection of equipment for leaks[10];
- Equipment containing PCBs shall not be exported or imported except for the purpose of environmentally sound waste management[11];
- Except for maintenance and servicing operations, not allow recovery for the purpose of reuse in other equipment of liquids with polychlorinated biphenyls content above 0.005 per cent[12];
- make determined efforts designated to lead environmentally sound waste management of liquids containing PCBs and equipment contaminated with PCBs having a PCBs content above 0.005%, in accordance with paragraph 1 Article 6 as soon as possible but no later than 2028[13];
- endeavour to identify other articles containing more than 0.005 per cent polychlorinated biphenyls (e.g. cable-sheaths, cured caulk and painted objects) and manage them in accordance with paragraph 1 of Article 6[14];
- provide reports every five years on efforts to eliminate PCB use to the Conference of Parties (COP)[15]

Article 5: Measure to reduce/eliminate releases from unintentional production and Annex C: Unintentional Production:

Each Party shall take measures to reduce the release of chemicals listed in Annex C (unintentionally produced) and where action should be taken to reduce and eventually

[10] Annex A, Part II (b)
[11] Annex A, Part II (c)
[12] Annex A, Part II (d)
[13] Annex A, Part II (e)
[14] Annex A, Part II (f)
[15] Annex A, Part II (g)

eliminate releases, which includes: Polychlorinated dibenzo-p-dioxins (PCDD), Dibenzofurans (PCDF), hexachlorbenzene, ***Polychlorinated Biphenyls (PCBs)***

In general, the Stockholm convention sets the deadline of 2025 (for the use of PCB in equipment) and 2028 (for final elimination of PCBs). However, it is acknowledged in the COP 8th meeting that these deadlines are not realistic since the parties are far from achieving the two key goals[16]. Nevertheless, since there have been no new deadlines being stipulated, it means that the formal deadlines (2025 and 2028) remains although they are unlikely to be met.

Indonesia has ratified the Convention through Law No. 19 of 2009.

1.3. Rotterdam Convention

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998), known as the Rotterdam or PIC Convention. The convention entered into force on the 25 February 2004.

The convention aims to promote shared responsibility and cooperation in the international trade in certain hazardous chemicals. The convention facilitates the information sharing and prior informed consent (PIC) among Parties and contributes to the environmental sound management of specific hazardous chemicals.

Prior Informed Procedure applies to the chemicals that are listed in the Annex III of the convention. It means that before they are being exported, the exporting country must ensure that the importing country has consented to its import. A table below shows several examples of chemical subject to PIC procedures, including PCB.[17]

Several Chemicals Subject to the Prior Informed Consent Procedure

Category	Chemical	Relevant CAS number
PESTICIDES	Aldrin	309-00-2
	Chlordane	57-74-9
	Dieldrin	60-57-1
	DDT	50-29-3
	Endosulfan	115-29-7
	Heptachlor	76-44-8
	Hexachlorobenzene	118-74-1
	Lindane	58-89-9
	Mercury compounds, including inorganic mercury compounds, alkyl mercury	-

[16]Report of the Conference of the Parties to the Stockholm Convention on Persistent Organic Pollutants on the work of its eighth meeting, http://chm.pops.int/TheConvention/ConferenceoftheParties/Meetings/COP8/tabid/5309/Default.aspx

[17] Annex III, Chemicals Subject to the Prior Informed Consent Procedure, As amended by the COP by its decision,http://www.pic.int/TheConvention/Overview/TextoftheConvention/tabid/1048/language/en-US/Default.aspx

	compounds and alkyloxyalkyl and aryl mercury compounds	
	Toxaphene	80001-35-2
Severely hazardous pesticide formulation	Methyl-parathion (emulsifiable concentrates (EC) at or above 19.5% active ingredient and dusts at or above 1.5% active ingredient)	298-00-0
Industrial	Polychlorinated biphenyls (PCB)	1336-36-3
	Polybrominated biphenyls (PBB)	36355-01-8 (hexa-) 27858-07-7 (octa-) 13654-09-6 (deca-
	Polychlorinated terphenyls (PCT)	61788-33-8
	Tetraethyl lead	78-00-2

Obligations of the parties are as follows:

- Designating a national authority and notify the secretariat[18];
- Banning or severely restricting chemicals and notify the secretariat[19];
- Developing country Party may propose to the Secretariat a listing of a severely hazardous pesticide for inclusion in Annex III[20];
- Implementing appropriate legislative or administrative measures to ensure timely decisions with respect to the import of chemicals listed in Annex III[21];
- Ensuring that the chemicals listed in Annex III are not exported from its territory to an importing Party contrary to the import decision notified by the Party[22];
- Provide an export notification to the importing Party unless the chemical is already listed on Annex III and acknowledging receipt of the export notification received[23];
- Requiring chemicals listed in Annex III and chemicals banned or severely restricted in its territory are subject to labelling requirements that ensure adequate availability of information with regard to risks and/or hazards to human health or the environment [24];
- Exchanging scientific technical, economic and legal information concerning the chemicals within the scope of this Convention including toxicology, ecotoxicology and safety information[25];

[18] Article 4
[19] Article 5
[20] Article 6
[21] Article 10
[22] Article 11
[23] Article 12
[24] Article 13
[25] Article 14

- Providing information to other Parties on domestic regulatory actions they have taken that substantially restricts one or more uses of chemicals[26];
- Conducting measures to establish and strengthen its national infrastructures and institutions for the effective implementation of this Convention[27];
- Ensuring that the public has appropriate access to information on chemical handling and accident management and on alternatives that are safer for human health or the environment.[28]

1.4. Ratification of the Basel, Rotterdam and Stockholm Conventions

The Basel Convention was ratified through a Presidential Decree in 1993.[29] Its amendment was ratified in 2005.[30] The Basel Convention Regional Centre in Indonesia was formalised by a Presidential Regulation in 2005.[31] Meanwhile, the Rotterdam Convention was ratified through Law No. 10/2013.[32] Several measures taken by Indonesia in order to implement the mandate of the convention were:

- Formulating Final Regulatory Action (FRA) document to be submitted to the international secretariat. FRA contains information regarding the decision of the parties to ban and/or restrict certain chemicals in order to protect human and environment[33];
- Formulating Import Response (IR) document. IR contains information pertaining to the decision of the party related to the future import possibilities of chemicals listed in Annex III[34];
- Developing information system related to B3 (hazardous and toxic substances) and POPs at the http://sib3pop.menlhk.go.id

[26] Article 14
[27] Article 15
[28] Article 15
[29] Keputusan Presiden Republik Indonesia Nomor 61 Tahun 1993 Tentang Pengesahan Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal.
[30] Peraturan Presiden Republik Indonesia Nomor 47 Tahun 2005 Tentang Pengesahan Amendment to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Amendemen Atas Konvensi Basel Tentang Pengawasan Perpindahan Lintas Batas Limbah Berbahaya Dan Pembuangannya).
[31] Peraturan Presiden Republik Indonesia Nomor 60 Tahun 2005 Tentang Pengesahan Framework Agreement Between the Government of the Republic of Indonesia and the Secretariat of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal on the Establishment of a Basel Convention Regional Centre for Training and Technology Transfer for Southeast Asia (persetujuan Kerangka Kerja Antara Pemerintah Republik Indonesia Dan Sekretariat Konvensi Basel Mengenai Pengawasan Perpindahan Lintas Batas Limbah Bahan Berbahaya Dan Beracun Serta Pembuangannya Tentang Pembentukan Pusat Regional Konvensi Basel Untuk Pelatihan Dan Alih Teknologi Bagi Asia Tenggara).
[32] Undang-Undang Republik Indonesia Nomor 10 Tahun 2013 Tentang Pengesahan Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (konvensi Rotterdam Tentang Prosedur Persetujuan Atas Dasar Informasi Awal Untuk Bahan Kimia Dan Pestisida Berbahaya Tertentu Dalam Perdagangan Internasional).
[33] Annual Report 2015, p. 44, Direktorat Jenderal Pengelolaan Sampah, Limbah dan Bahan Beracun Berbahaya, KLHK
[34] Ibid

The Stockholm Convention was signed in 2001 and ratified through Law 19 Year 2009.[35] Elucidation of Law 19/2009 outlines that one of the purpose of the ratification is to develop national regulation and technical guidance for managing persistent organic pollutants. However, to date, Law 19 has not been enumerated into implementing regulations.

1.5. Existing Regulations Relevant to Persistent Organic Pollutants

Indonesian regulatory framework distinguishes between "hazardous and toxic substances" (*bahan berbahaya dan beracun or "B3")* and *the waste* of hazardous and toxic substances (*limbah bahan berbahaya dan beracun or "Limbah B3"*). This distinction is also reflected in the division of units (and its regulatory competences) at the Ministry of Environment and Forestry. The B3 leading legislation is Government Regulation 74 Year 2001 on Hazardous and Toxic Substance Management ("GR 74") and the leading legislation for Limbah B3 is the Government Regulation No. 101 of 2014 on the Management of Hazardous and Toxic Waste ("GR 101"). Both Government Regulations directly implements the primary environmental legislation, the Law Number 32 Year 2009 on Environmental Protection and Management ("Law 32/2009").

1.5.1. Regulation on hazardous and toxic substances (B3)

GR No. 74 defines B3 as substances that, due to their characteristic, concentration and/or amount, either directly or indirectly, can pollute and/or damage the environment, and/or harm the environment, health and the life of humans and other living beings[36]. Government Regulation No. 74 of 2001 regulates *several* pollutants addressed in the Stockholm Convention. The pollutants listed in the attachment of the GR No. 74 are as follows:

[35] Undang-Undang Republik Indonesia Nomor 19 Tahun 2009 Tentang Pengesahan Stockholm Convention on Persistent Organic Pollutants (konvensi Stockholm Tentang Bahan Pencemar Organik Yang Persisten).
[36] Article 1 No. 1 GR No. 74/2001

List of POPs Based on GR No. 74/2001

Substances	Category Under GR No. 74/2001	Category Under Stockholm Convention
Aldrin	B3 that is forbidden to be used Chemical Abstract Service (CAS)[37]: 309-00-2 Synonym: HHDN Molecule formula: $C_{12}H_8Cl_6$	Annex A
Chlordane	B3 that is forbidden to be used CAS: 57-74-9 Synonym: CD68; Velsicol 1068; Toxichlor; Niran; Octachlor; Orthoclor; Synclor; Belt; Corodane. Molecule formula: C10H6Cl8	Annex A
Dieldrin	B3 that is forbidden to be used CAS: 60-57-1 Synonym: Compound 497; ENT 16225; HEOD; Insectiside No.497; Octalox	Annex A
DDT	B3 that is forbidden to be used CAS: 50-29-3 Synonym: Dichlorodiphenyltrichloroethane; D-58; Chlorophenothane; Clofenotane; Dicophane; pentachlorin; p,p-DDT; Agritan; Gesapon; Gesarex; Gesarol; Guesapon; Neocid. Molecule formula: C14H9Cl5	Annex B
Endrin	B3 that is forbidden to be used	Annex A
Mirex	B3 that is forbidden to be used	Annex A
Heptachlor	B3 that is forbidden to be used	Annex A
PCBs	B3 that is forbidden to be used CAS: 1336-36-3 Synonym: Polychlorinated Biphenyls; Chlorobiphenyls; Aroclor; Clophen; Fenclor; Kenachlor; Phenochlor; Pyralene; Santotherm. Molecule formula: C12X X=H or C	Annex A and C
Hexaclorbenzene	B3 that is forbidden to be used	-
Toxaphene	B3 that is forbidden to be used	-
Lindane	B3 that is restricted to be used	-

From the previous table in section 1.5.1 , it is shown that GR No. 74/2001 does not include chemicals under Annex C of the Stockholm Convention (chemicals which are unintentionally

[37] Chemical Abstract Service Registry Number, it is universally used to provide a unique, unmistakable identifier for chemical substances. A CAS Registry Number itself has no inherent chemical significance but provides an unambiguous way to identify a chemical substance or molecular structure when there are many possible systematic, generic, proprietary or trivial names. CAS Registry Numbers are used in many other public and private databases as well as chemical inventory listings and, of course, are included in all CAS-produced databases. https://www.cas.org/faqs

produced). This is because GR No. 74/2001 focuses on the chemicals as a raw material for activities rather than chemicals, which is resulted (unintentionally) from certain activities.

In addition, as explained above, currently, there are another chemicals being assessed by the POP Review Committee. In the future, the list of POPs to be eliminated and restricted will continue to grow. This is a very crucial issue for Indonesia, especially on the technicalities of how GR 74 can cope with the evolving list of POPs. Should the attachment be amended whenever there is a new list of POPs or should the Ministry of Environment formulate specific regulation regarding new POPs list?

1.5.2. Regulation on *the waste* of hazardous and toxic substances (*Limbah B3*)

The Leading regulation on Limbah B3, GR 101, is relatively new. GR 101 was enacted in 2014. The GR reflects the Basel Convention, as it not only regulates the management of Limbah B3 but also the transboundary movement of Limbah B3. PCB is categorized as hazardous and toxic waste. It is listed under the attachment of the GR, Table 1 (Limbah B3 from an unspecific source), coded as A101d and classified as hazard category 1. However, the GR still have not comprehensively adopted several Annexes of the Convention, which classify articles containing or contaminated with PCBs, and categorise them as hazardous and toxic waste.

2. PCB Regulation in Other Countries

2.1. United States of America

In the United States and Europe, beginning from 1929, the beginning of commercial use of PCBs until the beginning of the 1970s, PCBs was used both in open and closed systems (Commission, 2001). Nevertheless, in the United States (US), the use of PCB has been banned since 1979 under Toxic Substances Control Act (TSCA). It prohibits the manufacture, processing, use and distribution of PCBs.[38]

In June 1998, US EPA amended the PCBs and PCBs contaminated equipment regulations. The amended regulation, 40 CFR (Code of Federal Registration) Parts 750 and 761 is known as the PCB Mega Rule. The Mega Rule has detailed specification regarding PCBs (concentration) and PCBs contaminated equipment. The examples are as follows[39]:

- Contaminated transformers is a transformer that contains more than 50 ppm of PCB but less than 500 ppm of PCB (50 ppm > PCB < 500 ppm)
- Electrical equipment manufactured after July 2, 1979, is non-PCB (i.e., < 50 ppm PCBs).
- If the electrical equipment manufacture is unknown, it should be assumed that it is PCB-contaminated equipment;

[38] PCB Mega Rule Sec.761.2
[39] PCB Mega Rule Sec.761.2

- Mineral oil-filled electrical equipment that was manufactured before July 2, 1979, and whose PCB concentration is not established is categorized as PCB-Contaminated Electrical Equipment (i.e., contains ≥50 ppm PCB, but < 500 ppm PCB).

Retrofilling

Retrofilling of transformer is allowed in the US.

Registration

All owners of PCB transformers including transformers in the storage for reuse purpose are obliged to register to the Environmental Protection Agency (EPA) no later than 28 December 1998[40]. The registration includes the submission of information regarding: company name and address, contact name, telephone number, address where the transformers are located (if it is a mobile source such as ship, the owner should provide the name of the ship), number of PCB transformers and total weight (in kg) of PCBs contained in the transformers and whether the transformers contains flammable dielectric or not.

In addition, by 1 December 1985 the PCB Mega Rule also imposed the registration of PCB transformer used in commercial building (located in or near the building) to the building owners/ all building owners that are located within 30 meters of PCB transformers[41]. The information should be provided by the building owners are: location of the PCB transformer(s), type of dielectric fluid in the transformer(s) e.g. PCBs, mineral oil, silicone oil etc., type of transformer installation e.g. 208/120 volt network, 208/120 volt radial, etc.[42]

2.2. Philippines

The Philippines has several regulations regarding PCBs as follows:

- Department of Environment and Natural Resources (DENR) Administrative Order (DAO) 2004-01 regarding Chemical Control Order (CCO) for Polychlorinated Biphenyls.
- Environment Management Bureau (EMB) Circular No. 2015-004 regarding Clarifications to the CCO for Polychlorinated Biphenyls
- Environment Management Bureau (EMB) Circular No. 2015-007 on Technical Guideline Document on PCBs Management

One of the aims of CCO 2004-01 is to reduce and eventually eliminate the importation, production/manufacture, sale, transfer, distribution and use of PCBs, PCB equipment, PCB-contaminated equipment, non-PCB equipment, PCB articles and PCB packaging. The EMB Circular No. 2015-007 defines PCB wastes as "*any equipment or materials containing PCBs or have been in contact with PCBs* ***that are without any safe commercial, industrial, agricultural,***

[40] PCB Mega Rule Sec.761.30 (vi)(A)
[41] PCB Mega Rule Sec.761.30 (vii)
[42] PCB Mega Rule Sec.761.30 (vii)

or economic usage *as defined in the implementing rules and regulations for hazardous waste management (DAO 2013-22)".* This definition also includes liquid PCB waste, porous PCB wastes, and non-porous PCB wastes with specific conditions. The EMB defines that in the case of dielectric oil or porous materials contains less than 2 ppm of PCB, it is categorized as PCBs-free. Furthermore, a non-porous materials are classified as PCB-free if based on a wipe test, the level of PCB is less than or equal to 10 $\mu_g/100cm^2$.

The Philippines Government may amend the chemical control order into the following (whether this is finalized is not yet confirmed):

Phase Out Time Line

Activities	PCB Oil	PCB Contami-nated Oil	PCB Equi p-ment	PCB Contami-nated Equip-ment	PCB Contami-nated Porous Materials	PCB Contami-nated Non-Porous Materials	PCB Wastes	Non PCBs Equipment
Importation	BANNED							
Distribution								
Reuse								
Use	BANNED By March 19, 2014							Banned by December 30, 2018
Storage	BANNED By March 19, 2016							Banned by October 30, 2019
Disposal	Allowed within one (1) year of its generation but no longer than December 31, 2020							

Source: **Draft** Revised Chemical Control Order for Polychlorinated Biphenyls as of February 10, 2014

The classification of PCBs based on the EMB Circular No. 2015-007 is as follows:

PCB Classifications

Type of PCBs	Description	PCB Concentration
PCB Oil	Oil with PCB concentration greater than or equal to 500 ppm	PCB $\geq$ 500 ppm
PCB-Contaminated Oil	Oil with PCB concentration from 2 to less than 500 ppm	2 ppm $\leq$ PCB < 500 ppm
PCB Equipment	Any equipment containing dielectric oil with PCB concentration equal to or greater than 500 ppm	PCB $\geq$500 ppm
PCB -Contaminated Equipment	Any equipment containing dielecteric oil with PCB concentration from 50 ppm and higher but less than 500 ppm PCB	50 ppm $\leq$ PCB < 500 ppm
Non-PCB Equipment	Any equipment containing dielectric oil with PCB concentration from 2 to less than 2 ppm (PCB < 50 ppm)	2 ppm $\leq$PCB < 50 ppm

PCB –Contaminated Porous Material	Any porous material with PCB concentration greater than or equal to 2 ppm	PCB $\geq$ 2 ppm
PCB-Contaminated Non-Porous Material	Any non-porous material withPCB concentration greater than 10 micrograms per 100 square centimeter (μ_g/100 cm^2) based on a wipe test of the non-porous surface (10 x 10 cm^2)that have been in direct contact with PCBs	PCB>10 μ_g/100cm^2

Source: EMB Circular No. 2015-007

The public is guaranteed to have access to records or information obtained by the DENR. In the event a person(s) contravene with the CCO's requirement, applicable administrative and criminal sanctions based on RA 6969 will be imposed.

Retrofilling

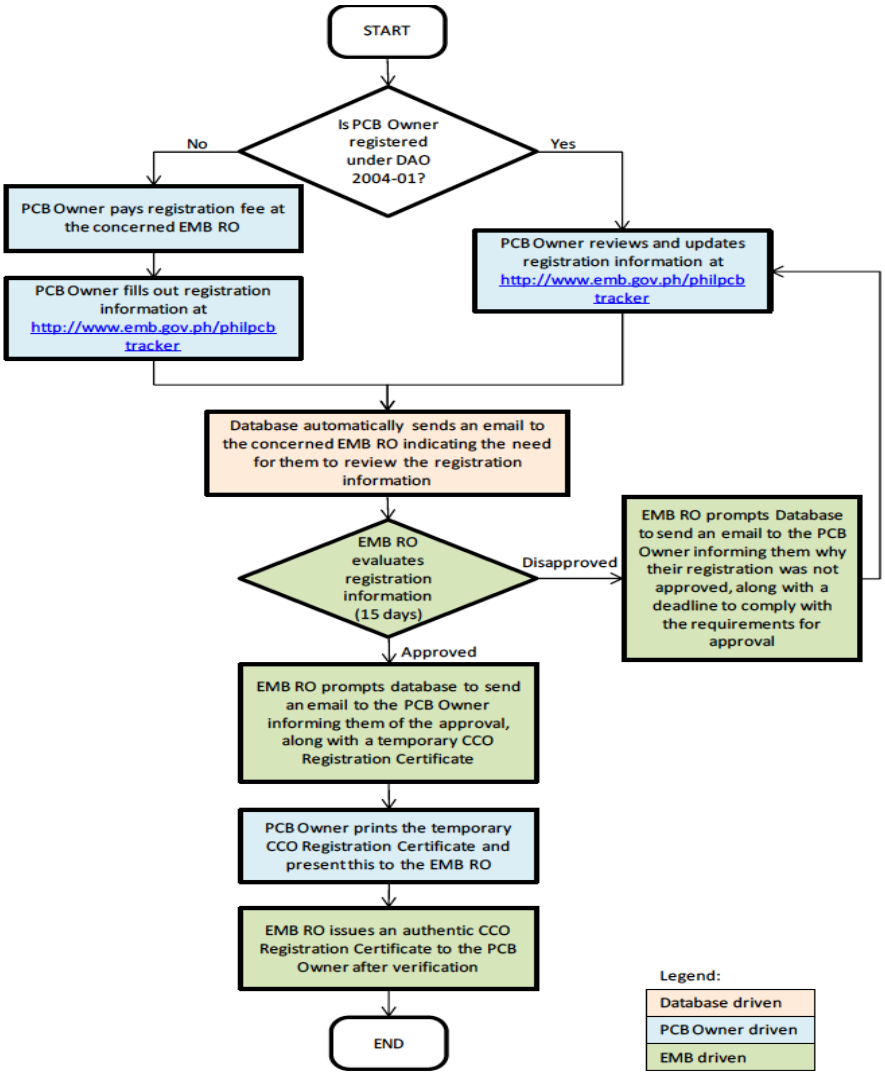
Based on CCO 2004-01, retroifilling means "*the replacement or substitution of PCB fluids in transformers with mineral oils or any other suitable dielectric fluid*"[43]. It is considered as re-use of the decontaminated equipment. Retrofilling of the PCB equipment and PCB contaminated equipment is prohibited[44].

Registration of PCBs

Registration is an obligation of PCBs Owners[45] that have materials and equipment as follows: transformers (oil filled), capacitors (oil filled), voltage regulators (oil filled), oil circuit breakers, hydraulic fluids, and heat transfer fluids[46].The Department of Environment and Natural Resources, Environmental Management Bureau (DENR EMB) has launched the online system to register the PCBs[47]. The registration mechanism is as follows:

Figure 1 Online Registration Process of PCBs Owners

[43] CCO 2004-01 Section II number 19
[44] EMB 2015-004 Section 10.2
[45] Based on the EMB Circular No. 2015-007, PCB Owner is defined as a person, organization, or establishment that owns, distributes, uses, operates, recycles, reprocess, stores, treats, or disposes any equipment, materials, or wastes that are contaminated with, in direct contact with, or containing PCB oil, PCB-contaminated oil, PCB equipment, PCB-contaminated equipment, non-PCB equipment, PCB-contaminated porous materials, PCB-contaminated non-porous materials, and PCB wastes.
[46] Environment Management Bureau (EMB) Circular No. 2015-007, Section 2.2 Qualification of Registration
[47] The system can be accessed at http://philpcbtracker.com/v3/index.php



Source: EMB Circular No. 2015-007

2.3. South Africa

The South Africa enacted a regulation under the National Environmental Management Act to phase out the use of PCBs Materials and PCBs Contaminated Material. The regulation aims to regulates phasing out stages and the use of PCB materials and PCB contaminated materials and sets a timeline regarding the process.[48]

[48] Chapter 1, 2(a) (b) National Environmental Management Act (107/1998) Notice 849 of 2013: Regulations to phase-out the use of Polychlorinated Biphenyls (PCBs) materials and Polychlorinated Biphenyl (PCB) contaminated materials.

Phase Out Time Line

Activities	PCB Materials	PCB Contaminated Materials	PCB Waste
Import and Export	Banned by 2014		
Produce	Banned by 2014		
Process			
Use	Prohibited in 2014 and should follow phase out requirements. Total Ban by 2023		
Sell	Banned by 2014		
Posses	Prohibited in 2014 should follow phase out requirements. Total Ban by 2026		
Disposal	N/A		

Source: National Environmental Management Act (107/1998) Notice 849 of 2013

Classification of PCBs

Type of PCBs	Description	PCB Concentration
PCB contaminated material	Articles or oil with PCB concentration greater than 51 mg/kg but less than 500 mg/kg	500 mg/kg <PCB >51 mg/kg
PCB material	Articles or oils with PCBs concentration less than 500 mg/kg.	PCB > 500 mg/kg
Non-PCB material	Articles or oils with PCBs concentration less than 50 mg/kg	PCB < 50 mg/kg
PCB free material	Article or oils with PCB concentration < 1 mg/kg	PCB < 1 mg/kg
PCB waste	Waste as defined in the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), which contains PCB materials or PCB contaminated materials; and "SANS 290" means the latest edition of the South African National Standards for Mineral insulating oils Management of polychlorinated biphenyls (PCBs).	

A person is guilty of an offence in the event that the person contravenes with the provision regarding the prohibition of the use, process, produce, import, export and sell PCB materials of PCN contaminated materials; phase out time frames; registration; notification; phase out plan submission and implementation; testing and labelling; classification, retro filling and reclassification of equipment; reporting. The penalties for the offence is a fine not more than R10 million or imprisonment for a period not more than 10 years or both.

Retrofilling

Retrofilling is allowed in South Africa. However, it has to be tested by an accredited laboratory before the transformer can be put back to service/operation. The concentration of PCBs in the

tested equipment must not exceed 50 mg/kg. The result from the laboratory research must be submitted to the Director General[49].

Registration of PCBs

The process of the registration is as follows[50]:

- Obligation to register is imposed to anyone who uses, dispose, treat, process or produce PCB materials or contaminated materials.
- The PCB registration form is provided and its covers information regarding the applicant's details and description of activities involving the use of PCB;
- The registration is submitted to the Director General in which issue a receipt and registration number to the registrant;
- Any changes regarding the PCB material details must be notified to the Director General within 30 days of the changes occurred.

2.4. European Union

In the European Union, the use of PCB in open applications (e.g. printing inks, adhesives) has been banned since 1976, based on Directive 76/403/EEC. In addition, the use of PCBs as a chemical intermediate or as a raw material has been banned since 1985, under the Directive 85/467/EEC 6th amendment to Directive 76/769/EEC. The EU has long history in regulating PCBs as follows (Enno Christian, 2005):

- Directive 76/769/EEC, July 1976 restricts the marketing and use of certain dangerous substances and preparations (including PCBs). This Directive was amended several times (e.g. Directive 85/467/EEC, October 1985 regarding the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations e.g. PCBs/PCTs). The use of the PCBs and PCTs is prohibited in closed system;
- Directive 89/677/EEC, December 1989 is the 8th amendment of the Directive 76/769/EEC. The use and re-use of PCBs and PCTs and any mixture containing both chemicals in more than 0.005% by weight (=50ppm) are prohibited based on the Directive 89/677/EEC;
- Directive 96/59/EC, September 1996 on the disposal of PCBs and PCTs replaces Directive 76/403/EEC (ban of use of PCBs in open applications, 1976). Directive 96/59/EC aims to approximate the laws of the member states on the controlled disposal of PCBs, the decontamination or disposal of equipment containing PCBs and/or the disposal of used PCBs in order to completely eliminate them. The year of 2010 was a deadline for complete disposal or decontamination of equipment containing PCBs).

Almost all of EU member states use the EU Directive limit (50ppm) to determine whether a material is contaminated with PCB or not in which this limit is relevant to the Stockholm Convention. However, some countries have more stricter limit such as the Netherland (0,5

[49]National Environmental Management Act (107/1998) Notice 849 of 2013, Chapter 3, Section 7 (1), (3), (4)
[50] Section 5 National Environmental Management Act (107/1998), Notice 849 of 2013

ppm per 7 congeners), Austria (30 ppm) and Norway (zero limit but in practice 50 ppm limit is acceptable) (Enno Christian, 2005).

Since the Stockholm Convention has been in force since 2004, most of the Member States have initiated necessary measures to implement the convention and promote environmentally sound management of PCBs. With regards to EU, it was stated that although the EU community has already had legal instruments that is relevant to the Stockholm Convention, it is responsible to perform obligations imposed by the convention[51].

Retrofilling

Transformer can be retrofilled to the level that us is allowed by the Directive 96/59/EC. For transformers in service with less than 5000 ppm (less than 500 KVA), retrofilling is considered as cost effective[52]. In addition, in service transformers with less than 50 ppm can be left in service and left alone[53].

2.5. England and Wales

The Environmental Protection (Disposal of Polychlorinated Biphenyls and other Dangerous Substances)(England and Wales) Regulation 2000, defines PCBs as any mixture containing any of the substances below totaling more than 0.005% by weight:

- Polychlorinated biphenyls (PCBs)
- Polychlorinared terphenyls (PCT)
- Monomethyl-dibromo-diphenyl methane
- Monomethyl-dichloro-diphenyl methane
- Monomethyl-tetrachlorodiphenyl methane

Registration

PCBs holders is required to register based on the following conditions[54]:

- The existing of containers containing residual stocks which contains PCBs or having contained PCBs that has not been decontaminated in which the total PCBs content is more than 5 litres (dm^3);
- Items of equipment contaminated (including any transformer, capacitor, with PCBs where the total PCBs content is more than 5 litres (dm^3).
- The registration form is provided and covers information regarding the applicant's details, description of the contaminated equipment and the location/intended

[51] Stockholm Convention on Persistent Organic Pollutant (POPs) http://www.pops.int/documents/signature/signstatus.htm

[52] Destruction and Decontamination Technologies For PCBs and Other POPs Wastes Under the Basel Convention, http://www.basel.int/Portals/4/Basel%20Convention/docs/meetings/sbc/workdoc/TM-A.pdf, p. 23

[53] Ibid

[54] Annual Registration of PCBs Holders, Guidance Notes, https://www.aber.ac.uk/en/media/departmental/healthsafetyenvironment/pcb_env_agency_guidance.pdf

location, description of PCB in the equipment, and the date regarding replacement or treatment/disposal.

- The PCB regulation is effective since 4 May 2000. Thus, all PCBs-contaminated equipment holders have to complete the registration process by 31 July 2000. It is a criminal offence to keep unregistered PCBs or contaminated equipment after 31 July 2000.

3. Definitions and concepts in the management of hazardous chemicals

3.1. Chemicals vs Articles

In EU, there is a distinction in the rules between chemicals and articles. Based on the Swedish Environmental Code[55] and EU REACH (Registration Evaluation, Authorization and Restriction of Chemicals) regulation[56], an article is defined as "*an object which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition"(*KEMI, 2014). The manufactured goods such as electronic chips, toys, and kitchen equipment are sample of article. In this case, a plastic granular material that is used as a raw material in the manufacturing industry is a chemical. However, if the granular is made into an object made of plastic (e.g a plastic toy), the object is an article, thus the rules of chemicals are no longer applicable for the article (KEMI, 2014). A certain article such as an ink cartridge is considered to be a packaging of a chemical. In other cases, a chemical is not considered as part of the article/packaging but as a separate chemical product in which the rules of chemicals apply (KEMI, 2014).

3.2. Chemical Substances vs Chemical Mixture

There are also different definitions regarding chemical substances and chemical mixtures. A chemical mixture means a mixture or solution composed of two or more substances. A chemical mixture consists of substances that do not chemically react with each other. An example is the substances contained in a can of paint which comprises of different substances,

[55] Chapter 14 Section 2 (3)
[56] Article 3 (3)

such as pigments, solvents, preservatives, etc.[57] Some examples of the mixture under REACH among others are paints, varnishes and inks[58].

REACH defines substance as "a chemical element and its compounds"[59]. The term substance includes "*substance obtained by a manufacturing process (e.g. formaldhyde or methanol) and substance in their natural state*". Based on REACH, "*the term substance is also incorporate its additives and impurities where these are part of manufacturing process but it excludes any solvent that can be separated without affecting the substance's stability or changing its composition"*.[60]

The EU Regulation on Classification, Labeling and Packaging of Substance defines the term substance as a "chemical element and its compounds in the natural state or obtained by any manufacturing process, including any additive necessary to preserve its stability and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition"[61]. In this regard, the definition of substance refers to the chemicals that are used in practice and occur in the market.[62] These may include synthesized chemicals, substances of natural origin (e.g crude oil, minerals or plant material), and pure metals. Basically, the starting point is an element or chemical compound. Nevertheless, the substance may contain various additives that are necessary for the substance to remain stable. According to the Swedish Chemicals Agency (KEMI) impurities are not considered as separate substances within the meaning of chemical legislation but form part of the chemical substance.[63] KEMI notes that since the definition are relatively open, it may cause problems in their applications, especially when the rules are formulated so that it is necessary to determine whether two chemicals are – under the legal definition – "identical", i.e. considered as the same substance in the legislation.

3.3. Hazardous Substances and Substances of Very High Concern

In the EU, the term "hazardous substances" refers to substances that can be characterized as hazardous based on the criteria under the CLP (Classification, Labeling and Packaging of

[57] 'Rules on Chemicals in the Life-Cycle of Articles – a Legal Analysis' (KEMI (Swedish Chemicals Agency) 2014) Report 314 <https://www.kemi.se/global/rapporter/2014/rapport-3-14.pdf>.

[58] ECHA, Guidance on Registration, November 2016, Version. 3.0, p. 13 https://echa.europa.eu/documents/10162/23036412/registration_en.pdf/de54853d-e19e-4528-9b34-8680944372f2

[59] Ibid

[60] 'Rules on Chemicals in the Life-Cycle of Articles – a Legal Analysis' (n 38).

[61] Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures, Amending and Repealing Directives 67/548/EEC and 1999/45/EC, and Amending Regulation (EC) No 1907/2006 (OJ L 353, 31.12.2008, p. 1).

[62] 'Rules on Chemicals in the Life-Cycle of Articles – a Legal Analysis' (n 38).

[63] ibid.

substances and mixtures) Regulation.[64] The hazard may include a health hazard, an environmental hazard, or a hazard due to physic-chemical properties e.g. flammability, etc.[65]

On the other hand, substances of very high concern are a smaller group of substances that have been defined in various ways and contexts. For example, based on REACH (Article 57), the term "substances of very high concern" refers to substances that are CMR (carcinogenic and mutagenic or toxic to reproduction), or is environmentally hazardous PBT substances (persistent, bio accumulative and toxic), or vPvB (very persistent and very bio accumulative).[66] According to REACH, in certain individual cases, substances can be considered as very high concern, even if they do not entirely meet the criteria for these hazardous properties. One example is the endocrine disrupting substance. Although it has hazardous properties (i.e. CMR, PBT, etc) it is separately mentioned in REACH and has separate definitions.[67] Certain substances that are fulfilling the criteria of PBT/vPvB might be eligible to be included in the Stockholm Convention or the UNECE Protocol on POPs. Even if the criteria to identify POPs are not exactly the same as the criteria of PBT/vPvB, they do partly overlap[68].

In general, chemicals in the market are often mixtures consisting of several substances. Some of these substances may have hazardous properties, others not. In general, the toxicity of the mixture is determined through conventional methods, based on the mixture and quantities contained in the hazardous properties. The hazardous properties of the mixture can be measured and can be tested.[69]

3.4. Substance, Mixture and Articles under Indonesian Regulations

The hazardous and toxic substances in Indonesia are managed under different regulations and institutions such as the Ministry of Environment and Forestry, the Ministry of Industry, the Ministry of Trade, the Ministry of Transportation, etc. However, there is no specific regulation regarding PCBs. The regulations regarding B3 can be found in the attachment I of this report.

At the basic level, the Ministry of Industry and Trade, the Ministry of Environment, and Ministry of Transportation have different terms regarding hazardous substances. In general, in the EU, the term "hazardous substance" means a substance that can be characterized as hazardous and may include a health hazard, an environmental hazard, or a hazard due to physic-chemical

[64] Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures, Amending and Repealing Directives 67/548/EEC and 1999/45/EC, and Amending Regulation (EC) No 1907/2006 (OJ L 353, 31.12.2008, p. 1) (n 42).
[65] 'Rules on Chemicals in the Life-Cycle of Articles – a Legal Analysis' (n 38).
[66] Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals, OJ L 396, 30.12.2006, p. 1.
[67] Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures, Amending and Repealing Directives 67/548/EEC and 1999/45/EC, and Amending Regulation (EC) No 1907/2006 (OJ L 353, 31.12.2008, p. 1) (n 42).
[68] ECHA, Guidance on Information Requirements and Chemical Safety Assessment, June 2017, p. 11, http://echa.europa.eu/documents/10162/13632/information_requirements_r11_en.pdf
[69] Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures, Amending and Repealing Directives 67/548/EEC and 1999/45/EC, and Amending Regulation (EC) No 1907/2006 (OJ L 353, 31.12.2008, p. 1) (n 42).

properties. However, in Indonesia, the ministries have different references to define the hazard.

The Ministry of Industry and Trade uses the term hazardous substance or *bahan berbahaya* (B2) to define "matters, chemical and biology substances, in the form of single and mixture that can be directly or indirectly harmful to the environment, and the substances have the toxicity, carcinogenic, teratogenic, mutagenic, corrosive and irritation characteristic"[70]. This definition includes chemical substances and mixtures.

With regards to hazardous and toxic substances (B3) the Ministry of Industry and Trade defines it as "substances include in one or more categories as follows: (1) toxic substances, (2) explosive substances, (3) flammable substances, (4) oxidator and redactor substances, (5) explosive and flammable substances, (6) pressured gas, (7) corrosive/irritant substances, (8) radioactive substances, (9) other hazardous and toxic substances stipulated by the Minister of Industry[71]".

The Ministry of Transportation, under the GR No. 74/2014 on Road Transportation uses the term dangerous goods or *barang berbahaya*. Elucidation of Article 63(c) states that what is meant by "dangerous goods" includes hazardous and toxic substance (B3). However, the decree does not provide more detail information regarding this matter.

On the other hand, Ministry of Transportation Decree No. KM 69/1993 uses the term hazardous substance (*bahan berbahaya*) to define "any substance or material due to its characteristics and condition, harmful for the health and public order and soul or human health and other living creatures"[72]. The categories of hazardous substance based on the Decree of the Ministry of Transportation are: (1) explosives (*mudah meledak*), (2) compressed gas, liquefied gas, dissolved gas at a certain pressure or cooling (*gas mampat, gas cair, gas terlarut pada tekanan atau pendingin tertentu*), (3) flammable liquid (*cairan mudah menyala*), (4) flammable solid (*padatan mudah menyala*), (5) oxidator, organic peroxide (*oksidator, peroksida organik*), (6) toxic and infectious substances (*racun dan bahan yang mudah menular),* (7) radioactive (*radioaktif*), (8) corrosive *(korosif),* (9) other dangers (*berbahaya lain*)[73]".

The Ministry of Manpower based on the Decree No. 187/Men/1999 regarding the Management of Hazardous Chemicals in the Workplace, uses the term hazardous chemical. The term of hazardous chemicals is defined as "*chemicals in the form of single or mixtures that based on the chemical and physic characteristics and/or toxicology are harmful to manpower, equipment and environment*[74]".

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[70] Ministry of Trade Regulation No. 75/M-DAG/PER/10/2014, Article 1(1). The definition in Indonesian is "*zat, bahan kimia dan biologi, baik dalam bentuk tunggal maupun campuran yang dapat*

[71] Minister of Industry and Trade No.148/M/SK/1985 on Safety of Hazardous and Toxic Substance in Industrial Companies, Article 1 (a). The Indonesian definition is "*"bahan yang termasuk dalam salah satu golongan atau lebih dari bahan-bahan berikut: (1) Bahan beracun, (2) Bahan peledak. (3) Bahan mudah terbakar/menyala, (4) Bahan oksidator dan reduktor, (5) Bahan yang mudah meledak dan terbakar, (6) Gas bertekanan, (7) Bahan korosi/iritasi, (8) Bahan radiooaktif, (9) Bahan beracun dan berbahaya lainnya yang ditetapkan oleh Menteri Perindustrian."*

[72] Minister of Transportation Decree No. KM 69/1993, Article 1 number 7. The definition in Indonesian is "*setiap bahan atau benda yang oleh karena sifat dan ciri khas serta keadaannya, merupakan bahaya terhadap keselamatan dan ketertiban umum serta terhadap jiwa atau kesehatan manusia dan makhluk hidup lainnya".*

[73] Minister of Transportation Decree No. KM 69/1993, Article 11 (2)

[74] Decree No. 187/Men/1999, Article 1 a

GR No. 74/2001 uses the term "hazardous and toxic substance" to define substances that, due to their characteristic, concentration and/or amount, either directly or indirectly, can pollute and/or damage the environment, and/or harm the environment, health and the life of humans and other living beings[75]. Furthermore, GR No. 74/2001, classifies the B3 to 15 characteristics such as[76]: (1) explosives (*mudah meledak)*, (2) oxidizing (*pengoksidasi)* (3) extremely flammable (*sangat mudah sekali menyala)*, (4) highly flammable (*sangat mudah menyala)*, (5) flammable (*mudah menyala)*, (6) *extremely toxic* (*amat sangat beracun)*, (7) highly toxic (*sangat beracun)*, (8) moderately toxic (*beracun)*, (9) harmful (*berbahaya)*, (10) corrocive (*korosif)*, (11) irritant (*bersifat iritasi)*, (12) dangerous to the environment (*berbahaya bagi lingkungan*), (13) carcinogenic (*karsinogenik*), (14) teratogenic (*teratogenik*), (15) mutagenic (*mutagenik*). The attachment II of the GR lists numbers of B3 that are forbidden to be used. **It needs to be clarified whether the list refers to a single substance or can be interpreted as a part of mixtures.**

From the discussion above, we can conclude that Indonesian legislation does not specifically differentiate between substance, mixture and article. From several discussions with Ministry officials, sometimes the term substance (*bahan*) are in practice interpreted extensively so as to include articles and mixtures. In this respect Transformers (which is actually an article containing a mixture of dielectric oil which may contain PCB) are treated as substance by the Ministry of Environment and Forestry. Nevertheless, they may not be treated as substance in other Ministries.

Furthermore, as discussed, sectoral decrees are also different in terms of naming it as B2 (*bahan berbahaya* or hazardous substances) and B3 (*bahan berbahaya dan beracun* or hazardous and toxic materials). This follows that sectoral regulations (industry, transport and environment) has different hazard statement and hazard categories. Thus, what is considered a B2 in one sector may not necessarily a B3 in other sectors?

3.5. Globally Harmonised System in Indonesia

Indonesia has adopted the Globally Harmonised System of Classification and Labeling of Chemicals, also known as the GHS system. It aims to globally unify the rules to classify hazards and provide same format and content for labels and safety data sheets (SDs). GHS defines and classifies the hazard of chemical products and communicates information regarding health and safety information through labels and SDs[77]. For the classification, **GHS applies to pure substance, as well as their diluted solutions and mixtures**. GHS is a non-binding rule but since it is important to unify the system, most of the countries have implemented it, including Indonesia.

The two main features of GHS are:

[75] Article 1 No. 1 GR No. 74/2001
[76] Article 5 (1) GR No. 74/2001
[77] Canadian Centre for Occupational Health and Safety, http://www.ccohs.ca/oshanswers/chemicals/ghs.html

- Classification of the hazard of chemicals is based on the GHS rules. In this case, the GHS system provides guidance to classify pure chemicals and mixtures according to its criteria or rules.
- Communication of the hazards and precautionary information using SDs and labels.

There are three major hazard groups based on the system as follows[78]:

- Physical hazards. The classes within the physical hazards are: explosives, flammable gases, aerosols, oxidizing gases, gases under pressure, flammable liquids, flammable solids, self-reactive substances and mixtures, pyrophoric liquids, pyrophoric solids, self-heating substances and mixtures, substances and mixtures that emit flammable gasses **when in contact with water**, oxidizing liquids, oxidizing solids, organic peroxides, and metal corrosives**.**
- Health hazards. The classes within the health hazard groups are: acute toxicity, skin corrosion/irritation, serious eye damage/eye irritation, respiratory or skin sensitization, germ cell mutagenicity, carcinogenicity, reproductive toxicity, specific target organ toxicity (singe exposure), specific target organ toxicity (repeated exposure) and aspiration hazards.
- Environmental hazards. The classes within the environmental hazards are: hazardous to the aquatic environment (acute and chronic), hazardous to ozone layer.

GHS is a non-binding rule but since it is important to unify the system, most of the countries have implemented it, including Indonesia. To implement the GHS system, the Indonesian government has enacted some regulations as follows:

- Minister of Industry Regulation No. 87/M-IND/PER/9/2009 on Globally Harmonized System of Classification and Labeling of Chemicals;
- Minister of Industry Regulation No. 23/M-IND/PER/4/2013 on the amendment of Minister of Industry Regulation No. 87/M-IND/PER/9/2009;
- Director General Industry Agro and Chemical Regulation No. 21/IAK/PER/4/2010 on the Technical Guideline on the Implementation of GHS;
- Director General of Industry and Manufacture Based Regulation No. 04/BIM/PER/1/2014 on the Technical Guideline and Implementation of GHS.

3.6. Chemical Substances under the Indonesian Chemical Bill

Indonesia does not have a comprehensive chemical law. However, there is a chemical bill that aims to develop harmony in the classification system and hazard communication, to optimize the use of chemical substances, and to eliminate the risk of chemical substances.

The bill (dated 23 February 2013) provides definitions for the basic terms as follows:

- A chemical substance is "all materials in the form of elements, a single compound and/or mixtures that are solid, liquid or gas.[79]"

[78] Ibid

[79] Chemical Bill, Article 1 number 1 The Indonesian definitions is "*semua materi berupa unsur, senyawa tunggal, dan/atau campuran yang berwujud padat, cair, atau gas."*

- A hazard is defined as ”the natural ability of the chemicals that can have a negative impact.[80]”
- A package of chemical substances is defined as “containers to trammel and/or wrap the chemicals.[81]”
- Chemical substance disposal is defined as “to process and dispose of chemicals that do not met specifications, expired chemicals, and/or discarded packaging of chemicals and chemical waste generated from the production or use of chemicals as remnants of bussiness/activity, or the results of the production process that cannot be used further and/or intended to be disposed of [82]
- Chemical substance extermination is defined as ”destruction attempts or decomposition/decomposition of chemicals as remnants of the production process that cannot be reused, expired chemicals, chemicals that do not meet specifications, and/or used chemical packaging, either technologically or naturally transform to a simple form.[83]”

Chemical substances that are regulated in the bill include all chemical substances in the form of raw materials (*bahan baku)*, intermediate materials (*bahan antara*), and/or finished goods (*bahan jadi*)[84]. The bill regulates: a) classification, hazard and risk communication and labelling of chemical substances, b) chemical substance management, c) value-added optimization, d) chemical safety and security, e) the authority of central government and local government, f) research and development[85].

The bill focuses on GHS system implementation rather than the establishment of a comprehensive chemical management such as the REACH regulation in the EU. The bill is more similar to CLP Regulation rather than REACH. The bill also relies on implementing regulations (e.g. government regulation) to further regulate and implement important aspects such as substance identification, reportage and chemical registration.

3.7. Waste

3.7.1. Waste under Conventions and EU Law

EU Directive

[80] Chemical Bill, Article 1 number 2. The Indonesian definition is “sifat kemampuan alamiah bahan kimia yang dapat memberi dampak negatif”.
[81] Chemical Bill, Article 1 number 6. The Indonesian definition is “wadah untuk mengungkung dan/atau membungkus bahan kimia”.
[82] “Chemical Bill, Article 1 number 12 The Indonesian definition is “memproses dan membuang bahan kimia yang tidak memenuhi spesifikasi, bahan kimia kadaluarsa, dan/atau bekas kemasan bahan kimia, dan limbah bahan kimia yang dihasilkan dari produksi atau penggunaan bahan kimia yang berupa sisa hasil usaha atau hasil proses produksi yang tidak dapat dimanfaatkan lebih lanjut dan/atau dimaksudkan untuk dibuang”.
[83] Chemical Bill, Article 1 number 13. The Indonesian definition is “upaya destruksi atau dekomposisi/penguraian bahan kimia yang berupa sisa hasil proses produksi yang tidak dapat dimanfaatkan kembali, bahan kimia kadaluarsa, bahan kimia yang tidak memenuhi spesifikasi dan/atau bekas kemasan bahan kimia, baik secara teknologi atau secara alamiah menjadi bentuk lebih sederhana”
[84] Chemical Bill, Article 4 (1)
[85] Chemical Bill, Article 5

Based on Directive 2006/12/EC on Waste**,** the term "waste" is defined as a "substance or object, which the holder discards, intends to discard, or is required to discard.[86]" In this regard, 'waste' includes any substance or object in the categories in Annex I of the Directive, which the holder discards, intends to discard, or is required to discard. Contaminated materials (e.g. oil contaminated with PCBs, etc) are included in the Annex I. In addition, disposal means that the content of the waste is not utilized but that the waste is incinerated, landfilled or disposed of some other way (KEMI, 2014).

The Basel Convention

The Basel Convention defines waste as "substances or objects, which are disposed of or are intended to be disposed of or are required to be disposed of by the provision of national law". Furthermore, hazardous wastes that shall be subject to the transboundary movement for the purpose of the Basel Convention are:

- Wastes that belong to any category contained in Annex I, unless they do not possess any of the characteristics contained in Annex III[87]; and
- Wastes that are not covered under paragraph (a) but are defined as, or are considered to be, hazardous wastes by the domestic legislation of the Party of export, import, or transit[88].

The Convention does not cover the following:

- Wastes that belong to any category contained in Annex II that are subject to transboundary movement[89].
- Wastes, which, as a result of being radioactive, are subject to other international control systems, including international instruments, applying specifically to radioactive[90].
- Wastes, which derive from the normal operations of a ship, the discharge of which is covered by another international instrument[91].

3.7.2. Waste under Indonesian Law

GR 101 – the leading regulation on B3 waste – covers the the stipulation of B3 waste, elimination of B3 waste, storage of B3 waste, collection of B3 waste, transportation of B3 waste, utilisation of B3 waste, management of B3 waste, stockpilling of B3 waste, dumping of B3 waste, exception of B3 waste, transboundary movement of B3 waste, environmental pollution control and/or environmental damage and environmental function rehabilitation, emergency response and B3 waste management, guidance, supervision, financing and administrative sanctions.

Waste is defined by GR 101 as: *remnants of business and/or activities that contain B3*[92]. A "remnant" means a quantity or a part that is left after the greater part has been used, removed

[86] Article 1 (a) Directive 2006/12/EC on Waste
[87] Article 1 a Basel Convention
[88] Article 1 b Basel Convention
[89] Article 2 Basel Convention
[90] Article 3 Basel Convention
[91] Article 4 Basel Convention
[92] Article 1 No. 3 GR No. 101/2014, Limbah Berbahaya dan Beracun adalah sisa suatu usaha dan/atau kegiatan yang mengandung B3.

or destroyed[93]. Remnant/residue is associated with leftover materials. The definition of B3 waste as a remnant of business and or activities that contain B3 reflects the end of pipe approach or proactive environmental reaction since the focus is on the remnant/residue.

Furthermore, the GR defines B3 as: "…substances, energy, and/or other components that, due to their characteristics, concentration and/or amount, either directly or indirectly, can pollute and/or damage the environment, and/or harm the environment, health and the life of humans and other living beings."[94]. Thus there is a slightly different definition regarding the term "hazardous and toxic" (B3) within GR 101 and GR 74. Based on GR No. 74/2001, B3 is "…substances that, due to their characteristics and or concentration and/or amount, either directly or indirectly, can pollute and/or damage the environment, and/or harm the environment, health and the life of humans and other living beings[95].

Stipulation of B3 Waste

Chapter II, of GR 101, especially Article 3 and 5 includes procedure regarding the stipulation of B3 waste.

Article 3(2) states that B3 waste based on its **hazard category** consists of:

a. B3 waste category 1;
b. B3 waste category 2.

Article 3(3) the B3 waste aforementioned in article (2) based on the sources are consists of:

a. B3 waste from non-specific source.

Table 1. List of B3 waste from non-specific sources. Waste from specific sources means B3 waste that is not generated from the main process but from activities such as equipment maintenance, washing, corrosion prevention, corrosion inhibition, crust dissolution and packaging[96]. The waste includes:

- Waste code A101d: waste containing the compounds of POPs and UPOPs such as PCBs, DDT, PCDD, and PCDF. In this case the waste is categorized as B3 waste category 1.
- Waste code A108d: waste contaminated with B3. It is categorized as B3 waste category 1.

[93] Definition based on *Kamus Besar Bahasa Indonesia*
[94] Article 1 No. 1 GR No. 101/2014, zat, energi, dan/atau komponen lain yang karena sifat, konsentrasi, dan/atau jumlahnya, baik secara langsung maupun tidak langsung, dapat mencemarkan dan/atau merusak lingkungan hidup, dan/atau membahayakan lingkungan hidup, kesehatan, serta kelangsungan hidup manusia dan makhluk hidup lain.
[95] GR No. 74/2001 "bahan yang karena sifat dan atau konsentrasinya dan atau jumlahnya, baik secara langsung maupun tidak langsung, dapat mencemarkan dan atau merusak lingkungan hidup, dan atau dapat membahayakan lingkungan hidup, kesehatan, kelangsungan hidup manusia serta makhluk hidup lainnya."
[96] Elucidation Article 3(3) GR No. 101/2014 "*Limbah B3 dari sumber tidak spesifik merupakan Limbah B3 yang pada umumnya bukan berasal dari proses utamanya, tetapi berasal dari kegiatan antara lain pemeliharaan alat, pencucian, pencegahan korosi atau inhibitor korosi, pelarutan kerak, dan pengemasan".*

Further consultation with experts is needed to determine whether a transformer (regardless its condition) that contains PCBs or is contaminated with PCBs, can be categorized as B3 waste from the non-specific source.

b. B3 waste from expired B3, spilled B3, B3 that does not fulfill the specification regarding product that is intended to be discharged, and used B3 packaging; and
c. B3 waste from specific source

In addition, list of B3 waste from Common Specific Source – Table 3, attachment of the GR, as follows:

Industry /Activity Code	Type of Industry/Activity	Waste Source	Waste Code	Waste Description	Hazard Category
32	All types of industry that produce or use electricity	Energy distribution facility Replacement refilling, reconditioning, retrofitting process from the transformer and capacitor Gas treatment facility Oil treatment and/or storage facility Air pollution control facility	A332-1	Sludge from the oil treatment or storage facility	1
			B332-1	Sludge and filter cakes from the gas treatment	2
			B332-2	Dust from the air pollution control facility	2

The table does not specifically include a PCB contaminated transformer or a transformer containing PCBs – although PCB can still be covered under A101d as above.

The process of replacement, refilling, reconditioning, retrofitting from the transformer and capacitor is identified as a source of waste. The waste that is described as a result of this process only cover sludge and dust.

Article 5(1) states in the event that there is waste which fall outside the B3 waste listed in the Attachment I that is indicated to have B3 waste characteristics, the Minister shall conduct characteristic test[97] to identify the waste as either category 1, category 2 or non-B3 waste.

In terms of PCBs, GR No.101/2014 Article 107 (5) states the treatment must comply with the efficiency standard of at least a 99.9999% destruction and removal of the polychlorinated biphenyl compounds. The emission standards related to the treatment will be further stipulated in the Ministerial Regulation[98]. Law 32/2009 regulates that if there is an expired B3 then it should be treated as B3 waste[99]. The same is stipulated in GR No. 101 Article 3(3) b mentioned above and GR No. 74/2001 which states that the expired B3 and/or B3 that does not fulfill the specification and/or used packaging must be managed under provision regarding hazardous and toxic waste (B3) management[100]**.** In this case, expired PCBs should be treated as B3 waste. Nevertheless, there is yet a specific regulation to manage articles/equipment

[97] GR 101/2014, Article 8, and 9 states that the characteristic test is conducted by a B3 waste expert tim appointed by the Minister. The decision regarding the category of waste will be stipulated by The Minister.
[98] GR No. 101/2014 Article 107(8)
[99] Article 59 Law No.32/2009
[100] Article 20 GR No. 74/2001

contaminated with PCBs. As yet, there are no technical guidelines regarding the management of equipment/products, such as transformers, capacitors and other electronic and electrical equipment containing PCBs, nor is there a technical code of practice or incentive mechanism for the extermination of PCBs.

Related regulations regarding the management of B3 waste can be found in the Attachment II of the report. Several legal issues that may arise are as follows:

- The definition of B3 "waste"
- Whether PCBs which are contained in articles and/or equipment (e.g transformer, capacitor) can be categorized as B3 waste regardless of their condition (e.g new, used) based on domestic (Indonesian) regulation.

As previously mentioned, GR No. 101/2014 defines "*limbah*" (waste) as remnants/residue. In this case, this definition cannot be applied for transformer. If the Ministry of Environment extends the term residue extensively, the application to the transformer would be as follows:

- In the case of transformer is a brand new one; it cannot be considered as a remnant/residue. If the transformer has already been used and is still in good condition, it is categorized as used rather than as a remnant/residue. The contextual definition of "remnant/residue" is not suitable to describe the aforementioned conditions of the transformers. The KLHK may interpret that a waste is not limited to the remnants/residue of the business and/or activities but also any object that it is not being used anymore.
- Nevertheless, if the "broad" definition above is used, the synthesis interpretation regarding a transformer containing PCBs as B3 waste is as follows: "A transformer is a remnant of business and/or activity that contains substances, energy, and/or other components (in this case PCBs) due to its characteristic, concentration (the level of the concentration will refer to the Stockholm Convention, e.g. 50-500 ppm) and/or amount, either directly or indirectly, that can pollute and/or damage the environment, and/or harm the environment, health and the life of humans and other living beings.

There is a gap between GR No. 101/2014 and the Basel Convention. The Basel Convention regulates PCB contaminated materials as shown in the table below, but the GR does not explicitly regulate it.

The Annexes of The Basel Convention

Annex I: Categories of Waste to Be Controlled (Waste Streams)	Y10	Waste substance and articles containing or contaminated with PCBs and/or Polychlorinated terphenyls (PCTs) and/or Polybrominated biphenyls (PBBs).
Annex VIII, List A A1. Metal and Metal-Bearing Wastes	A1180	Electrical waste and electronic assemblies or scarp (e-waste) containing components such as accumulators and other batteries included on list A, mercury-switches, glass from cathode-ray tubes and other activated glass and PCBs capacitors, or contaminated with Annex I constituents (e.g. cadmium, mercury lead, polychlorinated biphenyl) to an extent that they possess any of the characteristics contained in Annex III (note the related entry on list B B1110)[101]

[101] PCBs are at a concentration level of 50 mg/kg or more

	A1190	Waste metal cables coated or insulated with plastics containing or contaminated with col tar, PCB[102], lead, cadmium, other organohalogen compounds or other Annex I constituents to an extent that they exhibit Annex III characteristics.
Annex VIII, List A A3. Waste Containing Principally Organic Constituents, Which May Contain Metals and Inorganic Materials	A3180	Waste substances and articles containing, consisting of or contaminated with polychlorinated biphenyl (PCB), polychlorinated terphenyl (PCT), polychlorinated naphthalene (PCN) or polybrominated biphenyl (PBB), or any other polybrominated analogues of these compounds, at a concentration level of 50 mg/kg or more[103].

The Basel Convention defines PCBs as any material or substance containing a PCB concentration more than 50 ppm.

PCB and e-wastes

Some PCBs are used chemicals in electrical products (chemical-in-products). It is therefore important to mention some regulation on e-waste, which is also listed in Annex VIII of the Basel Convention. There is no a specific definition or specific regulation on e-waste management yet. However, GR No. 101/2014 includes several types of e-waste (e.g printed circuit board, cathod ray tube, etc) as shown in the table below:

List of B3 Waste from Common Specific Source

Industry/ Activity Code	Type of Industry/ Activity	Waste Source	Waste Code	Waste Description	Hazard Category
28	The assembly of electronic components or electronic equipment	Electronic components or electronic equipment manufacture and assembly Waste water treatment facility which treats the effluent	A327-5	Sludge from waste water treatment facility	2
			A328-1	Mercury contactor/switch	1
			A328-2	Fluorescent lamp (hg)	1
			A328-3	Solution for printed circuit	1
			A328-4	Caustic strapping (photoresist)	1
			A328-5	Sludge from the assembly production process	1
			B328-1	Cathode Ray Tube (CRT)	2
			B328-2	Coated glass	2

[102] Ibid

[103] The 50 mg/kg level is considered to be an internationally practical level for all wastes. However, many individual countries have established lower regulatory levels (e.g. 20 mg/kg) for specific wastes.

			B328-3	Solder residue and its flux	2
			B328-4	Printed circuit board (PCB)	2
			B328-5	Metal cable waste & its insulation	2
			B328-6	Sludge from waste treatment facility	2
29	Recondition or remanufac-turing electronic goods	Electronic component and equipment remanufacture, recondition and assembly Waste water treatment facility which treats the effluent	A329-1	Mercury contactor/switch	1
			A329-2	Fluorescent lamp (hg)	1
			A329-3	Caustic strapping (photoresist)	1
			A329-4	Cathode Ray Tube (CRT)	2
			A329-5	Solution for printed circuit	1
			A329-6	Sludge from production process	1
			A329-1	Coated glass	2
			A329-2	Solder residue and its flux	2
			B329-3	Printed circuit board (PCB)	2
			B329-4	Metal cable waste & its insulation	2

Relevant Regulations Regarding E-waste Management

No	**Regulations Title**
1	Environmental Protection and Management Act No. 32/2009
2	Law No. 18/2009 on the Waste Management
3	Presidential Decree No. 61/1993 on Basel Convention Ratification
4	Presidential Regulation No. 47/2005 on the Ratification of the Amendment of Basel Convention
5	Government Regulation No. 101/2014.
6	Minister of Public Work Regulation No. 03/PRT/M/2013 on the Waste's infrastructure and facilities in order to handle the domestic waste and similar type of waste
7	Minister of Trade and industry Decree No. 39/2005 regarding Imported Used Machinery and Equipment (transportation equipment)
8	Minister of Industry and Trade Decree No. 520/MPP/Kep/8/2003 regarding the Prohibition of Hazardous and Toxic Waste Import

E-waste is unusable and/or nonfunctioning electronic or electric appliances since it becomes obsolete and needs to be disposed of either in whole form or as parts[104]. E-waste that is categorised as toxic and hazardous waste should be any e-waste containing components or parts made of or containing toxic and hazardous substance[105]. According to one official, after

[104] Haruki Agustiana, Indonesian Ministry of Environment, Identification of E-Waste and Secondhand e-products in Indonesia, Beijing, 28-29 March 2007
[105] Ibid

the e-waste is dismantled, it is only the components containing or contaminated by hazardous and toxic substance/materials that would be categorised as hazardous and toxic waste[106].

4. Regulatory Framework for PCB Life Cycle in Indonesia

4.1. Import, Export and Production

Based on GR 74, PCBs is categorized as B3 that is forbidden to be used. GR 74 added that a B3 that is forbidden to be used means the type of B3 that is forbidden to be used, produced, distributed or imported[107]. The transition article of the GR No. 74/2001 states that at the time when the GR is enacted and the B3 that is forbidden to be used still exists in Indonesia, such B3 can be exported to the country that is in need of that B3, based on the existing export mechanism[108]. The GR does not provide sanctions for those who use and/or possess such B3.

The Law on Environment (Law 32/2009) [109]prohibits everyone to "insert" (*memasukkan*) B3 that is forbidden to be used based on the law and regulation, to the Indonesian territory. The elucidation of the articles states that B3 that is forbidden to be used among other are DDT, PCBs and Dieldrin. The Act No. 32/2009 imposes criminal sanctions of imprisonment (minimum 5 years and maximum 15 years), and fines of minimum Rp. 5,000,000,000 and maximum Rp. 15,000,000,000, for those who imports/inserts the B3 that is forbidden to be used. Nevertheless, similar to GR 74, the law does not have sanctions for those who use and/or possess such B3.

Furthermore, PCB is included in the Indonesian Negative List of Investment. Presidential Decree No. 39/2014 regarding Business Fields that are Closed and Opened to the Requirement of Investment lists the type of chemical industry that is potentially damaging to the environment (e.g the pesticide industry's active substances, namely DDT, Aldrin, Endrin, Dieldrin, Chlordane, Heptachlor, Mirex, Toxaphene) as well as the industrial chemical industry's substances, namely Polychlorinated biphenyl/PCB and Hexachlorobenzene, as the business fields that are closed for investment.

4.2. PCBs Import to Indonesia

The import of PCBs in various forms to Indonesia can be found in the report of Statistic Agency (*Badan Pusat Statistik*), as follows:

Imported PCBs as Commodity to Indonesia February 2015

Import By Harmonised System Commodity, FEBRUARY 2015[110]				
Commodity Description	Net Weight (Kg)		Value C.I.F (US$)	
	Current Month	Cumulative, January to date	Current Month	Cummulative, January to date

[106] Ibid
[107] Article 1 number 10 GR No. 74/2001
[108] Article 41 GR No. 74/2001
[109] Article 69 (1) b Environmental Protection and Management Act
[110] http://perpustakaan.bappenas.go.id/lontar/file?file=digital/155140-%5B_Konten_%5D-BULETIN_IMPOR_0215.p

2710910000 Waste oil, containing PCBs, PCTs or PBBs	7	654	1328	17197
3824820000 Mix and preparation containing pbbs, PCBs, PCTs	330	5121	132067	339681

From the table above, it can be seen that PCBs in the form of waste oil and mixture substances with HS Code 2710910000 and 3824820000 are imported to Indonesia. The Harmonised System (HS) code is a nomenclature for international product that is developed by the World Customs Organisation (WCO). There are at least 200 countries using the system as a reference for their customs tariff policy and to collect information regarding the international trade statistic[111].

In Indonesia, the importation of commodities and tariffs is regulated by the Minister of Finance Regulation No. 213/PMK.011/2011 regarding The Stipulation of Goods Classification System and Imposition of Import Duty for Imported Goods (*Penetapan Sistem Klasifikasi Barang dan Pembebanan Tarif Bea Masuk atas Barang Impor*). The HS Code 2710910000 is regulated in the Attachment II, Chapter 27 Article 3. The Article states:

For the purpose of heading 27.10 “waste oils” means waste containing mainly petroleum oils and oils obtained from bituminous minerals, whether or not mixed with water. These include:

(a) Such oil no longer fit for use as primary products (for example, used lubricating oils, used hydrolic oils **and used transformer oils**);
(b) Sludge oils from the storage tanks of petroleum oils, mainly containing such oils and high concentration of additive (for example, chemicals) used in the manufacture of the primary products; and
(c) Such oils in the form of emulsions in water or mixture with water, such as those resulting from oil spills, storage tank washing, or from the use of cutting oils for machining operations.

The import duty for the HS Code 2710910000 is 0%, based on the Attachment III of the regulation.

In addition, HS Code with the heading 3824 is a category for prepared binders for foundry moulds or cores, chemical products and preparations of the chemical industries (including those consisting of mixture of natural products), not elsewhere specified or included. The import duty for HS code 3824820000 is 5%.

There is a need to clarify the status of the PCBs with the HS Code 2710910000 and 3824820000 whether it should be categorized as B3 waste or B3. If it is considered as B3 waste, the relevant ministries should prohibit the importation immediately and revise the existing regulation.

[111] World Costums Organisation, What is the Harmonised System? http://www.wcoomd.org/en/topics/nomenclature/overview/what-is-the-harmonized-system.aspx

4.3. Distribution of POPs in Indonesia

There are at least two verdicts of the Indonesian court regarding the case on the distribution of pesticides containing endosulfan. Based on the verdict of Tegal Court No. 24/Pid.Sus/2015/PNTgl, Mr Tan Swat Hng the owner/manager of a agricultural supplies shop in Tegal City, faced 3 months imprisonment and fined Rp. 4,000,000 (four million Indonesian Rupiah) based on Article 60 (1) g and h, Article 60 (2) g and h Law No. 12/1992 regarding Plants Cultivation (*Budi Daya Tanaman*). It was proven that the shop sold unregistered pesticides namely Akodani, Indodan, and Akodan in which based on the examination of the Indonesian Police Forensic Laboratory Centre (Puslabfor) it was found that the Indondan contained endosulfan. Endosulfan is one of the types of pesticides that is prohibited to be used for rice plants based on Presidential Instruction No. 3/1986 regarding the Chocolate Planhopper Pest Control Improvement for the Plants (*Peningkatan Pengendalian Hama Wereng Coklat Pada Tanaman*). Mr Tan Swat Hng was convicted for: a) intentionally distributed unregistered pesticides or not in accordance with the label as it is stipulated in the Article 38 (1) Law No. No.12/1992, and b) intentionally do not dispose pesticides that are forbidden to be distributed, not qualified, damaged, or unregistered as it is stipulated in Article 41 Law No. No.12/1992.

A similar case happened in Malang City. Based on Malang Court verdict No. 505/Pid.Sus./2015/PN.Mlg, Mr Ivan Budianto, the owner of an agricultural supplies shop in Malang City faced 1 month imprisonment based on Article 60 (1) g Law No.12/1992, Article 60(2) g Law No.12/1992. It was proven that the shop sold unregistered pesticides namely Akodani and Indodan, in which they contained endosulfan, based on the examination of Agrochemical Residue Substances Laboratory, Bogor Institute of Agriculture. Mr Budianto was convicted for: a) intentionally distributed unregistered pesticides or not in accordance with the label as it is stipulated in the Article 38 (1) Law No. No.12/1992 and b) intentionally do not dispose pesticides that are forbidden to be distributed, not qualified, damaged, or unregistered as it is stipulated in Article 41 Law No.12/1992.

The two cases mainly refer to the Law No. 12/1992 as the case is relevant with the regulations specific to pesticides. In this case, the Law No. 74/2001 cannot be applied as the attachment II of Law focuses on endosulfan as a substance rather than as a mixture.

4.4. Registration

B3 registration means the registering and numbering B3 that exist in Indonesia[112]. GR 74 puts a one-time obligation to register on importer or producer of B3, especially for the B3 that is

[112] Registrasi B3 Online Terintegrasi INSW, Penerapan Registrasi B3 Online Dalam Mendukung Tata Kelola B3 Nasional, Direktorat Pengelolaan B3, Direktorat Pengelolaan Sampah, Limbah dan B3, KLHK, Jakarta 10 Juni 2016, http://www.menlhk.go.id/berita-106-launching-aplikasi-registrasi-b3-online-pada-pekan-lingkungan-hidup-dan-kehutanan-2016-jumat-10-juni.html

imported for the first time.[113] Nevertheless, under GR 74, there is no obligation for owners of B3 to register. In addition, the import of product containing B3 (PCBs) is not under the authority of KLHK and is not regulated under GR 74/2001.

In terms of B3 registration, the MoEF issues Ministry Regulation No. 2/2010 regarding The Utilisation of Hazardous and Toxic Substance (B3) Electronic System Registration within the Framework of INSW (Indonesia National Single Window) at the Ministry of Environment and Forestry.[114]INSW is a national system that enables single submission of data and information, single and synchronous processing of data and information, and single decision-making for custom release and clearance of cargoes[115]. The B3 electronic aims to handle customs documents, which relates to permitting and/or import and/or export of B3 within the framework of INSW[116]. The Deputy in the MoEF that is responsible for the B3 management implements the registration.[117]

For the purpose of comparison, the registration system for pesticide and halon is elaborated below.

Pesticide Registration

Based on the hazard, pesticides are categorized in two groups, forbidden pesticides and pesticides that can be registered. The forbidden pesticides are those which meet criteria as follows[118]:

- The formulation of the pesticide includes as class Ia (extremely dangerous) and Ib (very dangerous) based on World Health Organisation (WHO) classification;
- The active and/or additive ingredients on pesticides have carcinogenic effect (category I and IIa based on the classification of International Agency for Research on Cancer (IARC), mutagenic and teratogenic based on Food and Agriculture Organisation (FAO) and WHO;
- The active and/or additive ingredients of the pesticides caused drug resistantcy to human;
- The active and/or additive ingredients of the pesticides are included as POPs (Persistent Organic Pollutants) based on Stockholm Convention.

Pesticide registration is only applicable to pesticides that is not categorised as forbidden pesticides and/or does not contain prohibited substances as explained above. The pesticide should comply with the pure grade of active ingredients based on FAO and WHO specification[119]

There are two types of licenses for pesticides they are trial license and permanent license[120]. Trial license is given by the Director General to the applicant in order to prove its claim for the quality and the safety of pesticide being registered[121]. Under this license, the pesticide is

[113] Article 6(1),(2)GR No 74 Tahun 2001 Tentang Pengelolaan Bahan Berbahaya Dan Beracun
[114] The title of the regulation in Indonesian is *Penggunaan Sistem Elektronik Registrasi B3 dalam Kerangka Sistem INSW di KLHK.*
[115] Ministry of Environment and Forestry Regulation No. 2/2010, Article 1 number 6
[116] Ministry of Environment and Forestry Regulation No. 2/2010, Article 2
[117] Ministry of Environment and Forestry Regulation No. 2/2010, Article 6
[118] Ministry of Agriculture Regulation No. 39/Permentan/SR.330/7/2015, Article 6(1),(2)
[119] Ministry of Agriculture Regulation No. 39/Permentan/SR.330/7/2015, Article 22 (1),(2)
[120] Ministry of Agriculture Regulation No. 39/Permentan/SR.330/7/2015, Article 11
[121] Ministry of Agriculture Regulation No. 39/Permentan/SR.330/7/2015, Article 12(1),(2)

forbidden to be distributed or be used commercially.[122] In terms of permanent license, it consists of three types, they are: a) pesticide permanent license, b) pesticide technical material permanent license, and c) pesticide permanent license for export. Under the permanent license, the pesticide can be produced, distributed and used.[123] As pesticides are primarily regulated under agriculture legislation, the whole system of pesticide registration is administered by the Ministry of Agriculture.

Halon Registration

With respect to the phasing-out of the ozone-depleting substances, the Indonesian government enacted registration measures for Halon through the Minister of Environment Regulation No. 35/2009 regarding Halon Management**.** Halon is used in the refrigerant system/cooling system. In terms of the registration, the regulation obliged any parties possessing Halon to:

Store the Halon based on the attachment of the regulation;

- Keep the records of the storage balance sheet (*pencatatan neraca penyimpanan*) and the use of Halon in the log book;
- Report the amount of Halon in their posession to the environmental agency in the Regency/City at minimum once in a year and submit the copy to the Ministry of Environment and Forestry and responsible agency for environmental management in the province;
- Report the plan to eliminate the use of Halon to the Ministry of Environment and Forestry and responsible agency for environmental management in the province;
- Maintain the system and/or equipment that are using Halon which are installed or in the storage in order to prevent them leakage.

As it is already mentioned previously, there is no mechanism to register equipment/article containing/contaminated with PCBs. GR 101 is also absent on the registration of PCB Waste.

With regards to PCBs phasing out, additional measures can be imposed to companies having PCBs and/or equipment/transformers containing PCBs in their facility/storage (while they are waiting to be disposed). The Halon registration procedure can be used as precedent and practices in other countries can be used as a comparison.

4.5. Packaging and Labelling of B3

The labelling for B3 is regulated in general under Ministry of Environment Regulation 03 Year 2008 (Permen LH 03/2008) on The Symbol and Labelling of B3.[124] Under the Globally Harmonized System (GHS), PCB hazard is coded as H373, H400 and H410 and the Pictogram is coded under GHS08 and GHS09. The legal bases for GHS are:

[122] Ministry of Agriculture Regulation No. 39/Permentan/SR.330/7/2015, Article 12(3)
[123] Ministry of Agriculture Regulation No. 39/Permentan/SR.330/7/2015, Article 13(2),(4)
[124] Peraturan Menteri Negara Lingkungan Hidup Nomor 3 Tahun 2008 Tentang Tata Cara Pemberian Simbol Dan Label Bahan Berbahaya Dan Beracun.

- Minister of Industry Regulation No. 87/M-IND/PER/9/2009 on Globally Harmonized System of Classification and Labelling of Chemicals as amended by Minister of Industry Regulation No. 23/M-IND/PER/4/2013;
- Director General Industry Agro and Chemical Regulation No. 21/IAK/PER/4/2010 on the Technical Guideline on the Implementation of GHS;
- Director General of Industry and Manufacture Based Regulation No. 04/BIM/PER/1/2014 on the Technical Guideline and Implementation of GHS.

GHS09 GHS08

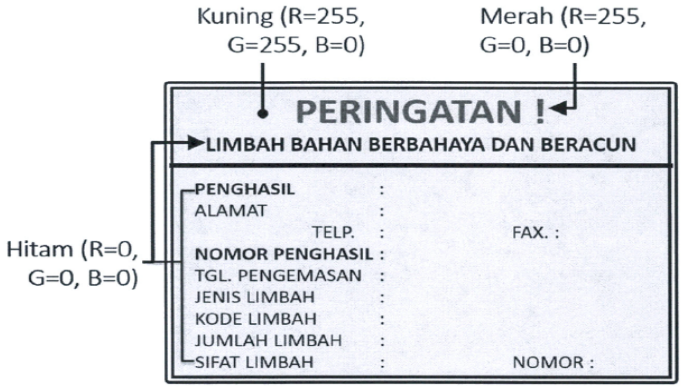
Under GHS, PCB is coded as GHS09 and GHS08. This corresponds to Picture 8 (dangerous to the environment) and Picture 9 (carcinogenic, tetragenic and mutagenic) substances of Attachment of Permen LH 03/2008. Any articles/equipment, mixtures or substances containing PCBs, which are in use or in the form of waste, must be labelled according to the above pictograms.

4.6. Packaging and Labelling of B3 Wastes

The labelling for B3 Waste is regulated in general under Ministry of Environment Regulation No. 14/2013 (Permen LH 14/2013) on Symbol and Labelling of B3 Waste. The symbol and labelling of the B3 waste should be done for: a) containers and/or packages of the B3 waste, b) site/location for the B3 storage, c) vehicle transporting B3 waste[125].

Figure 2 Label for B3 Waste Containers/Packages[126]

[125] Ministry of Environment Regulation No. 14/2013, Article 2 (2)
[126] Ministry of Environment Regulation No. 14/2013, Attachment



The symbol and labelling of the B3 waste should be based on the B3 waste hazard characteristic which includes a) explosive (*mudah meledak*), b) flammable (*mudah menyala*), c) reactive (*reaktif*), d) toxic (*beracun*), e) infectious (*infeksius*), f) korosif (*corrocive*), g) dangerous to the environment (*berbahaya terhadap lingkungan*)[127]. Thus, under Ministry Regulation 14/2013, in order to label PCBs waste, it is important to identify the hazard characteristic of the PCBs waste.

Figure 3 B3 Waste Symbol: Dangerous to the Environment[128]

However, there are differences in terms of the pictogram and hazard characteristic between B3/GHS and Limbah B3. The characteristic of carcinogenic, tetragenic and mutagenic are not present – presumably intended to be covered by "toxic" but this is also not precise.

4.7. B3 Waste Storage

[127] Ministry of Environment Regulation No. 14/2013, Article 2 (6)
[128] Ministry of Environment Regulation No. 14/2013, Attachment

B3 waste treatment license for storage activities[129] lasts for 5 years and can be extended[130]. The maximum durations for the B3 waste storage are [131]:

- 90 days since the B3 waste is produced in which the volume is 50 kg per day or more (B3 waste category 1) ;
- 180 days since the B3 waste is produced in which the volume is less than 50 kg per day (B3 waste category 1) ;
- 365 days since the B3 waste is produced in which the volume is less than 50 kg per days (B3 waste category 2 from non-specific sources or from common specific sources); or
- 365 days since the B3 waste is produced in which the volume is less than 50 kg per day (B3 waste category 2 from the specific sources) .

-

In the event the storage of the B3 waste beyond the time period, the license holder of B3 waste management for B3 waste storage activities shall utilize the B3 waste, treat/process the B3 waste and/or landfilled the B3 waste, and/or transfer the B3 waste to other parties which are[132]: B3 waste collector, B3 waste utilizer, and/or B3 waste land filler[133]. As explained above, PCB is considered as B3 waste category 1 from the non-specific source. It is important to note that, the period of the storage of the B3 waste is shortened as the risk of hazard increase with the increase of amount.

Administration sanctions applied for the violation of the above provisions. The administrative sanctions consist of: a) written notice, b) government coercion (*paksaan pemerintah*), c) the freezing of the B3 waste management license for the B3 waste storage activities[134].

In one induction meeting[135], official from one region stated its concern that they do not have sufficient storage and B3 waste treatment facility available in the city. Therefore, the BLH may ask companies that have equipment (transformers) containing/contaminated with PCBs to keep/store them in their companies until the facility is available. However, the problem is that the 90-day limit for temporary storage is a regulatory limit, in which, upon the elapse of such limit all waste must be processed for disposal. Nevertheless, the absence of a PCB disposal facility in Indonesia meant that the 90-day limit would inevitably be surpassed. In addition, this may trigger administrative and legal actions towards the company if a contamination occurs. Indonesian regulation adheres to the strict liability principle in the event of B3/B3 waste contamination.

One of the options is to exercise discretion (of not enforcing) the lapse of time limit. However, such discretion may cause complicated legal problem as explained below.

In addition, such discretion could be problematic under The Law on Government Administration (Law 30 Year 2014, hereinafter the “GovAdmin Law”). The GovAdmin law

[129] Izin pengelolaan limbah B3 untuk kegiatan penyimpanan limbah B3
[130] GR No.101, Article 21
[131] GR No. 101, Article 28 (1)b
[132] GR No. 101, Article 29(1)
[133] GR No. 101, Article 29(2)
[134] GR No. 101, Article 243
[135] Induction Meeting, Serpong, 24 February 2016

defines discretion as decision or action which are taken when dealing with concrete matters.[136] This is further detailed in Chapter VI which is dedicated to regulating discretion. Article 23 of the GovAdmin Law limits discretion into four possibilities (i) when laws and regulation provide options for decision or action, (ii) when laws and regulations are silent, (iii) laws and regulations are incomplete are unclear and (iv) the decision or action needs to be taken stagnation in government, for the greater good. In this case, possibilities of (i), (ii) and (iii) are closed, since GR 101 does not provide option, is not silent and very clear about the time limit. Only (iv) becomes a possibility, nevertheless, the GovAdmin Law elucidation clarifies that government stagnation occurs, for example, in major events such as disaster or political turmoil, which renders the government to be dysfunctional. Evidently, this condition is not applicable to the case at hand. As such, laws and regulations does not seem to provide latitude for discretion in this case.

It needs to be mentioned that discretion could be rendered void or voidable for reasons listed in Articles 30 and 31. Article 32 mentioned that a discretion could be voidable if they are, among other, (i) not in accordance with the purpose of the authority or (ii) is against the good governance principles. Indeed, during the drafting of the GR 101 presumably, the condition where wastes are stockpiling due to the absence of treatment facilities (and therefore require more time to stockpile until the facilities are in place) was not anticipated. Thus the discretion was based on a good intention to facilitate compliance. **On the other hand**, the regulation provides option to export the B3 waste in the event that the B3 waste producer cannot process the waste or the facility to utilise/treat/process the waste is not exist in Indonesia[137] It could be argued in the Court that the strict liability principles and the polluters pays principles require the waste to be exported – at the company's cost. Thus, it can be argued, that the government should not facilitate further delays of such action – especially by extending the time limit through discretion – and as such, (it can be argued that) the discretion is considered to be against the good governance principles. This is of course a very subjective argument as it is also possible to counter-argue by suggesting that if this time limit is directly enforced, then the whole phasing-out process as required by the Stockholm Convention would not be possible – and thus a policy objective cannot be attained.

Finally, one of the most important legal risks in exercising such discretion is not administrative but liability. As previously mentioned, the treatment of B3 wastes is different given the polluters' pays principles and the strict liability principle. If a contamination occurs during the period that the time limit for storage is extended through discretion, then the government could also be held liable for issuing a policy, which contradicts a regulation. The motive for giving time limit for storage is to lessen the risk. If the government extends the time limit, it means that it has wilfully and knowingly, extend the risk of contamination in direct contradiction with the regulation, especially if formulated in a written policy, could expose the government to lawsuit, in case a contamination occurred. This is because the nature of hazardous substances, which entails strict liability, as previously mentioned

[136] Undang Undang Republik Indonesia Nomor 30 Tahun 2014 Tentang Administrasi Pemerintahan. See Article 1 (9)
[137] GR No. 101, Article 123 (1), (4)

4.8. B3 Waste Collection

The B3 waste producer is obliged to collect its waste.[138] In the event that the B3 waste producer cannot collect its own B3 waste, it is obligated to request the B3 waste collector to do it[139]. The permit for the B3 waste management for the B3 waste storage activities lasts for 5 years and is extendable.[140] However, the duration for the B3 waste storage in the B3 waste collection facility is 90 days since the PCBs waste is transferred to the B3 waste collector. In the event the B3 waste storage exceed 90 days, the B3 waste collector is required to transfer the collected B3 waste to other parties [141] such as: B3 waste user, B3 waste treatment/processor, and B3 waste land filler[142]. Administration sanctions applied for the violation of these provisions.

4.9. Transportation

Transportation of B3

Government Regulation No. 74 /2001 (GR 74) on the Management of B3 require transporters to be equipped with Materials Safety Data Sheet (MSDS).[143] Further, GR No. 74/2001 refer to prevailing transportation regulations in terms of the roadworthiness of each vehicle.

Transportation of B3 Waste

Government Regulation No.101/2014 Chapter VI contains provision regarding the transportation of B3 waste. The B3 transporter must have a recommendation letter to transport B3 waste from the Ministry of Environment and Forestry and a permit regarding B3 waste management to transport B3 waste from the Minister of Transportation.[144] In order to obtain the letter of recommendation, a written application should be submitted along with: a) the identity of the applicant, b) the deed of the establishment of the business entity, c) a proof of ownership pertaining to the environmental prevention and pollution funds and/or environmental damage and environmental rehabilitation assurance fund, d) a proof of ownership regarding the vehicle, e) B3 waste transport document[145] f) contract/agreement among the B3 waste producer and the B3 waste collector, B3 waste utilisator (*pemanfaat limbah* B3), B3 waste processor (pengolah limbah), and/or B3 waste land filler (*penimbun limbah B3*) whose have permit[146].

[138] GR 101 Article 31(1)
[139] GR 101, Article 32 (1)
[140] GR 101, Article 36 (1)
[141] GR 101, Article 45(1)
[142] GR 101, Article 45(2)
[143] Article 12 GR No. 74/2001
[144] Article 48(1) GR No.101/2014
[145] The document should covers information regarding the amount and type of vehicle, source, name and characteristic of B3 waste, B3 waste emergency respond procedure, equipment to handle B3 waste, loading and unloading of B3 waste procedure.
[146] Article 48(3) GR No.101/2014

4.9.1. Road Transportation

General provisions regarding road transportation of hazardous substance is regulated under GR No. 74/2014 on Road Transportation. The detailed requirements are further stipulated under the Ministry of Transportation Decree No. KM.69/1993 on Goods Transportation by Road and its amendment, Decree No. KM 30/2002.

Based on the Decree No. KM.69/1993, the transportation of hazardous substances should use vehicle that meets the technical requirements.[147] The vehicle should equipped with company's name, placard, driver's identity, first aid box, and radio communication. It is also required to be equipped by eyeglasses, mask, gloves, and safety clothes for the passengers[148]. Attachment IV of the Decree provides examples of the shape and size of the placard for the vehicle transporting hazardous substance.

Further requirements regarding the transport of hazardous substance is regulated under the Director General of Land Transportation Decree No. SK.725/AJ.302/DRJD/2004 regarding the Land Transportation of the Hazardous and Toxic Substance. Some of the provisions on the Decree regulates: a) Vehicle to transport B3; b) Driver and Driver's Helper; c) Hazardous and toxic substance trajectory; d) Operational procedure for vehicle transporting hazardous and toxic substance; e) Approval for the hazardous and toxic substance transportation; f) Obligation of the hazardous and toxic substance transporter; g) The responsibility of the owner and/or party responsible for the hazardous and toxic substance; h) Supervision; and i) Information system and management.

In addition, obtaining an approval from the Director General of Land Transportation prior to transporting B2 is a must[149]. For the purpose of the approval, the Director General of Land Transportation issued Decree No. SK.1280/AJ.302/DRJD/2004 on the Form, Color and Size of a Letter of Approval regarding the Transport of Heavy Equipment and Hazardous and Toxic Substances.

The hazardous substance transport services have specific characteristics that should be fulfilled such as: the road infrastructure traversed for transporting B2 should comply with the road classification; the availability of places, loading and unloading facilities; the hazardous substance is transported by the designated vehicle that meets criteria to transport hazardous substance; the availability of transportation document from relevant agency; the transportation should have special signs and labels as classified in the attachment III of the Decree No. 69/KM.1993[150].

There is a slight different definition regarding hazardous substance based on the Decree with other existing regulations such as Ministry of Trade Regulation and GR No. 74/2001.

The Minister of Transportation Decrees and the Director General Decree only mention transportation for hazardous substance/hazardous and toxic substance. **It does not specify the transportation for the hazardous waste and/or hazardous and toxic *waste*.**

[147] Article 11(1) Decree No. 69/KM.1993
[148] Article 14(1)(2) Decree No. 69/KM.1993
[149] Article 12 (1) Decree No. 69/KM.1993
[150] Article 13 Decree No. 69/KM.1993

4.9.2. Marine Transportation

Transporting B3 (Hazardous and Toxic Substances)

Minister of Transportation Decree No KM. 17/ 2000 regarding Guideline on Handling Substances/Dangerous Goods in Indonesia Navigation was issued to implement the International Maritime Dangerous Goods (IMDG) Code as a guide to handle hazardous substance/material in Indonesia's navigation. The guide consists of Book I, II, III, IV and its supplements as the attachment of the Decree.

Minister of Transportation Regulation No. KM 02/ 2010 on the amendment of Minister of Transportation Decree No. KM 17 of 2000, states that the Director General of Marine Transportation is appointed as the competent authority for the implementation of International Maritime Dangerous Goods/IMDG Code 2008 within Indonesia's water territory [151] . The authorities of the Director General are: a) organizing and stipulating requirements for hazardous substance handling training; b) stipulating the classifications of hazardous substances; c) authorize the hazardous substance packing; d) authorizing certain requirements from IMDG Code 2008; e) exempting IMDG Code 2008[152].

Based on the IMDG Code, dangerous goods mean the substances, materials and articles covered by the IMDG Code[153]. Substances (which include mixtures and solution) and articles that are regulated under the Code are assigned to one of the classes 1-9 based on the hazard or the highest threat of the hazard they present. The hazard classes can be found in the attachment.[154]Several substances from classes 1 to 9 are considered as marine pollutants. Specific marine pollutants with extreme pollution potential are identified as severe marine pollutants.

Transporting B3 Waste (Hazardous and Toxic Waste)

In terms of terms of wastes, they should be transported based on the provisions of the appropriate class, considering their hazards and criteria in the Code. IMDG Chapter 7.8 Provide Provisions regarding Transport of Wastes. Based on the Preamble of the chapter, it is states that " *wastes, which are dangerous goods, shall be transported in accordance with the relevant international recommendations and conventions and, in particular, where it concerns transport by sea, with the provisions of this code".* Wastes that are not subject to this Code but covered under the Basel Convention may be transported under Class 9[155].

In 2014, the Minister of Transportation issued Regulation No. PM 29/2014 regarding Marine Pollution Prevention. Chapter V of the regulation specifically includes provisions regarding B3 Waste Transportation. The vessel that is used to transport B3 waste has to comply with the requirement [156] . Several requirements are: manifest document, marking, labelling and stowage, loading procedure (*tata cara pemuatan),* pollution control and safety equipment[157].

[151] Article 1A (1) Minister of Transportation Regulation No. KM 02/ 2010
[152] Article 1A (2) Minister of Transportation Regulation No. KM 02/ 2010
[153] Chapter VII Regulation 1 IMDG Code
[154] IMDG Code
[155] Section 7.8.4.6 IMDG Code
[156] Regulation No. PM 29/2014, Article 80 (1)
[157] Regulation No. PM 29/2014, Article 80 (3)

The applicant/transporter has to provide: sufficient data regarding the vessel, copy of pollution prevention certificate, copy of safety certificate, data and information regarding type of B3 waste being transported, standard operational procedure for transporting the B3 waste[158]. In the event that the requirements are fulfilled, the Director General of Marine Transportation (*Direktur Jenderal Perhubungan Laut*) issues the permit letter for transporting of hazardous and toxic waste, in which the format of the letter is provided by the regulation[159].

In 2015 the Director General of Marine Transportation issued Circular Letter No.003/I/2/DK-15 regarding B3 waste Transportation for the Indonesian Flag Vessels (*Pengangkutan Limbah Bahan Berbahaya dan Beracun Bagi Kapal-Kapal Berbendera Indonesia*). The circular letter requires a reporting obligation for the ship owner to report all the B3 waste transportation activities to the local harbormaster (*syahbandar*) and provides the copy of the report to the *Direktur Perkapalan dan Kepelautan, Ditjen Hubungan Laut (Hubla).*

4.9.3. Air Transportation

Air Transporation is regulated under Ministry of Transportation Regulation No.KM 16/2009 on Civil Aviation Safety Regulation (CASR) Part 92 on the Safe Transport of Dangerous Goods by Air. The Director General of Air Transportation is in charge to monitor the implementation of this regulation. The definition regarding dangerous goods is refer to the CASR that is "*Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the technical instructions or which are classifies according to those instructions[160]."* The technical instruction refers to the document entitled Technical Instruction for the Safe Transport of Dangerous Goods by Air, issues by the International Civil Aviation Organization.

Nevertheless, the Ministry of Transportation Regulation KM 16/2009 applies only for civil aviation and it is not assigned for specific aircrafts transporting dangerous goods.

4.10. B3 Waste Utilisation

Under GR 101, B3 waste utilization is defined as the activities of re-use, recycle and and or recovery (*perolehan kembali*) which aims to transform B3 waste into usable products that can be used to substitute raw materials, factory supplies (*bahan penolong)* and/or fuels that are save to the human health and environment[161].

B3 waste can be utilized for several purposes: a) as a substitute of raw material, b) as a source of energy, c) as a raw material, d) other purpose based on the development of science and technology[162]. The B3 waste management permit for the B3 waste utilization lasts for 5 years

[158] Regulation No. PM 29/2014, Article 80 (1)
[159] Regulation No. PM 29/2014, Article 80 (4)
[160] Subpart 92.010 CASR Part 92
[161] GR 101, Article 1 number 22
[162] GR 101, Article 54

and can be extended.[163]. Prior to the issuance of the permit, the utilisator has to obtain environmental permit and approval for the piloted B3 waste utilization.[164] The approval for the piloted B3 waste utilization lasts for maximum 1 year and cannot be extended. [165] The approval is given by the Minister of Environment in order to test the equipment, method, technologies, and/or B3 waste utilization technology. [166]

In the induction meeting[167], there was a question on the possibility of PCBs being utilized or recycled into other materials. However, based on the discussion in the induction meeting, if dielectric oils are intended to be recycled, it has to be purified.

Raw Material Substitution/Alternative Fuel

In 2010, the Minister of Environment issued a Decree No. 140/2010 regarding Permit to Utilise B3 Waste for PT Holcim Indonesia TBK, Cibinong Plant Unit. The Decree was valid until 2015. It stipulated several requirements for the company in order to utilize and to collect B3 waste as follows:

The type of B3 waste being collected and utilized by PT Holcim Indonesia should be:

- B3 waste that can substitute main raw material, auxiliary raw material, or alternative fuel;
- The type of B3 waste were utilized as a substitute of the raw material must have a total content of SiO2, Al2O3, Fe2O3, and CaO ≥ 50%;
- The type of B3 waste were utilized as a substitute of fuel must have a total content of calori equal to or more than 2500 kkal/kg and comply with the limits the total amount of organic halide (TOX) ≤ 2% wet weight and maximum content of PCBs maximal 30% of TOX;

The type of B3 waste were utilized as a substitute of main material and/or fuel must meet the limit of metal pollutants.

Under current permits, B3 waste liquid containing PCBs can be utilized to substitute fuel by PT Holcim Indonesia Tbk – Cibinong Plant Unit as long as it meets the requirement. The B3 waste liquid must be burnt in the main burner that has an interlock system[168]. The stored and collected B3 waste can be stored maximum 90 days prior to the utilization. The Decree[169] also provide requirement regarding emission monitoring and reporting, as well as general requirement pertaining to storage, symbol and transportation.

In addition to Decree No. 140/2010, the Ministry of Environment had issued other Decrees for PT Holcim Indonesia Tbk regarding the utilisation and/or management of the B3 waste. The Decrees are as follows:

[163] GR 101, Article 87(1)
[164] GR 101, Article 76(4)
[165] GR 101, Article 81
[166]GR 101, Article 76(7)
[167] Induction Meeting, Serpong, 24 Februari 2016
[168] Minister of Environment Decree No. 140/2010 regarding Permit to Utilise B3 Waste for PT Holcim Indonesia TBK, Cibinong Plant Unit.
[169] Minister of Environment Decree No. 140/2010 regarding Permit to Utilise B3 Waste for PT Holcim Indonesia TBK, Cibinong Plant Unit.

- Decree No. 187/2011 regarding Permit on the B3 Waste Management Through Thermal Method in the PT Holcim Indonesia Tbk. Cibinong Plant Unit. The attachment of the decree listed the emission standard for the PCDDs/PCDFs/PCBs (DRE maximum 99,9999 %) and POHCs (DRE maximum 99,99%). **The Permit was valid until 14 September 2016.**
- Decree No. 327/2010 regarding Permit to Utilise B3 Waste for PT Holcim Indonesia Tbk.
- Decree No. 697/2008 regarding Permit for the operation of the B3 waste processing equipment (kiln as an incinerator) for PT Holcim Indonesia Tbk, Cilacap Plant Unit.
- Decree No. 391/2008 regarding Permit to Utilise B3 Waste for PT Holcim Indonesia Tbk.
- Decree No. 506/2007 regarding Permit to Utilise B3 Waste as a substitute of fuel and raw material alternative for PT Holcim Indonesia Tbk, Cilacap Plant Unit.

Based on the explanation above it can be argued that at the time of writing Indonesia allows the re-utilization of B3 waste. In the case of PT Holcim Tbk, PCB oils can be use as a substitute for the fuel[170]. This policy needs to be reviewed—especially on whether PCBs waste (after treatment) can be reused or should be disposed. This also signifies that Indonesia still allows the practice of B3 waste (PCBs) disposal with thermal process. Also, it is important to review the thermal method to dispose B3 waste (especially POPs), as the Stockholm Convention does not recommend it.

4.11. B3 Waste Treatment/Processing (*Pengolahan Limbah B3*)

B3 waste treatment shall be treated by anyone who produces it. In the event that the person cannot treat the waste he/she has to transfer it to the party who treats the B3 waste or export the B3 waste that he/she had produced[171] Government Regulation 101 on B3 Waste outlines several treatment options of B3 wastes in general, which includes (i) Thermal Process, (ii) Solidification/Stabilisation and (iii) other means.

Thermal Process

GR No. 101 stipulates that the B3 waste treatment through thermal process has to meet several standards such as emission standard, combustion efficiency and the destruction and removal efficiency (DRE) for the principle organic hazardous constituents (POHCs) which includes PCBs, Polychlorinated dibenzofuran, and Polychlorinated dibenzo p-dioksin. The combustion efficiency minumun should be 99,99% and the DRE should be equal or more than 99,9999%[172]. The GR mandated the formulation of the emission standard through the Ministry regulation[173]. Nevertheless, this regulation is not yet issued when this report is being prepared.

[170] Minsitry of Environment Decree No. 140/2010
[171] GR 101/2014, Article 123(1)
[172] GR 101/2014, Article 107 (4), (5), (6),(7)
[173] GR 101/2014, Article 107 (8)

The residue and/or the combustion residue from the thermal process have to be kept[174]. Some standards that have to be meet are[175]:

- Air emission;
- Combustion efficiency at least 99,99% (however, this number does not relevant for the B3 waste treatment utilising kiln at the cement industry);
- Destruction and removal efficiency (DRE) of the POHCs (principle organic hazardous constituent) at least 99,99% (however this standard does not relevant for the B3 waste with infectious characteristic and/or polychlorinated biphenyl that is potentially releases polychlorinated dibenzofurans, and polychlorinated dibenzo-p-dioxins).
- The DRE of the PCB is 99,9999%
- The DRE of the polychlorinated dibenzofurans has to be 99,9999% as well as the DRE of polychlorinated dibenzo-p-dioxins.

Although permitted by existing regulations, B3 waste treatment especially POPs with combustion at the incinerator or kiln cement should be avoided due to the reasons below:

- The Stockholm convention, Article 6 (d) ii[176] implies that POPs (e.g. POPs waste or waste containing POPs) should be destroyed or irreversibly transformed into non-POPs and does not pose the characteristic of POPs. In this context, it is important that the destruction method/technology being used will not produce unintentional release of POPs.
- The convention, Article 6(d) iii[177] prohibits the disposal of POPs through recovery (*perolehan kembali*), recycling (*daur ulang),* reclamation, direct use *(penggunaan secara langsung*) atau *alternative uses* (*penggunaan alternative*) POPs.

Annex C, V. A (d) of the Stockholm Convention states:

"*Priority should be given to the consideration of approaches to prevent the formation and release of the chemicals listed in Part I (PCDD/PCDF, HBC, PCB): Replacement of feed materials which are persistent organic pollutants of where there is a direct link between the materials and releases of persistent organic pollutants from the source*".

In terms of *unintentional production* of POPs, the Stockholm Convention prioritize the use of technology which could form **PCDD/PCDF, HBC, PCBs** as listed under list I Annex C. **Annex C, V B (b)** of the Convention reads:

"*When considering proposals to construct new facilities or significantly modify existing facilities using processes that release chemicals listed in this Annex,* ***priority consideration*** *should be given to alternative processes, techniques or practices that have similar usefulness but which avoid the formation and release of such chemicals*."

[174] GR 101/2014 , Article 143 (1) h
[175] GR 101/2014 , Article 107 (1), (2), (3), (4), (6),(7), (8)
[176] The Articles states "Disposed of in such a way that the persistent organic pollutant content is destroyed or irreversibly transformed so that they do not exhibit the characteristics of persistent organic pollutants or otherwise disposed of in an environmentally sound manner when destruction or irreversible transformation does not represent the environmentally preferable option……."
[177] The Articles states "Not permitted to be subjected to disposal operations that may lead to recovery, recycling, reclamation, direct reuse or alternative uses of persistent organic pollutants"

Furthermore, several literatures suggest against using thermal processes: (i) the investment to control unintentional release of dioxin or other POPs is huge[178]; incineration may result in large amount of solid wastes (fly ash and residues), Dioxin, Furan and other POPs can be released[179]; the technology is controversial and opposed by environmental groups and communities[180]; for *Cement kiln air pollution controls* (APC) there are potentials for *products of incomplete combustion*/PIC[181]; the DRE *(Destruction and Removal Efficiency)* is generally applicable for gases/air emission but does not include liquid and solid toxic contaminants (bottom ash and liquid waste).[182]

Non Thermal Processes

Several non-thermal processes may include Dehalogenation processes: Base Catalyzed Decomposition (BCD) and metal based sodium. Similar to the above thermal processes, the by-product of such technology must become a factor for consideration. For example, BCD may produce soluble which contains Chlorin and further treatment for such materials may be required.

4.12. B3 Waste Landfilling (*Penimbunan Limbah B3*)

B3 waste landfilling may not be generally applicable to PCB. However, GR No. 101/2014 states that in the case that the B3 waste is processed through the stabilisation and solidification methods the result of the processed should be landfilled[183]**.** Thus, if PCBs if it is treated through stabilization and solidification methods, the result of the processed should be landfilled and comply with regulation.

Under GR 101, B3 waste landfilling shall be done by anyone who produces it. In the event that the person cannot landfill the waste, he/she has to transfer it to the B3 waste landfilling[184].

The landfilling can be done in the B3 waste landfill facility such as: a) final landfilling class I, class II and class III, b) injection wells, c) backfilling in the mined area (*penempatan kembali di area bekas tambang*),d) tailing dam and/or B3 waste landfill facility in accordance with the development of science and technology.[185]. In the event that B3 waste is landfilled in the final landfill (facility), the location has to meet several conditions such as: free from flood, meet the

[178] Allsop, Michelle, Costner, Pat, et.al, Incineration and Human Health, Greenpeace Research Laboratories, University of Exeter, UK, 2001, p.37, http://www.greenpeace.org/norway/Global/norway/p2/other/report/2001/incineration-and-human-health.pdf
[179] Reference Guide to Non Combustion Technologies for Remediation of Persistent Organic Pollutants in Soil, Second Edition 2010, US – EPA, p. vii, https://www.epa.gov/remedytech/reference-guide-non-combustion-technologies-remediation-persistent-organic-pollutants
[180] ibid
[181] Karstensen, K. H. (2008). Formation, release and control of dioxins in cement kilns. *Chemosphere*, *70*(4), 543-560. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.454.9778&rep=rep1&type=pdf
[182] Rahuman, Mujeebur, Pristone, Luigi, et.al, Destruction Technologies for Polychlorinated Biphenyls (PCBs), ICS-UNIDO Publications "Proceedings of Expert Group Meetings on POPs and Contamination: Remediation Technologies (April 2000) and on Clean Technologies for the Reduction and Elimination of POPs (May 2000), p. 8, https://clu-in.org/download/remed/destruct_tech.pdf
[183] GR 101/2014Article 143(3)
[184] GR 101/2014Article 145 (1),(2), Article 162 (1)
[185] GR 101/2014Article 146(2), (3), Article 163(2)

land permeability standards, geologically safe and stable, outside of the conservation area, and is not located in the water catchment areas (*daerah resapan air*) for drinking[186]. In addition, the facility has to: meet the design criteria, be equipped with coating system, have monitoring wells, have final overburden (*lapisan penutup akhir*) and other equipment[187]. Test on the total contaminant concentrations must be conducted prior to applying for B3 waste management permit for B3 waste landfilling.[188] The permit lasts for 10 years and can be extended. [189].

4.13. Accident and Emergency Response

In terms of B3, general measures for accident and emergency responses are regulated in GR 74. Under the GR , anyone in charge of managing B3 is under obligation to (i) isolate, (ii) mitigate, (iii) report the incident to local authorities, (iv) provision information to local communities.[190] Local government must undertake all necessary steps after receiving report of such incidents[191].

In terms of B3 waste, general measures for accident and emergency responses are regulated in GR 101 in the form of (i) provision of information to local communities through both printed and electronic media that a contamination has occurred within 24 hours after the incident or after it become known, (ii) isolation of affected areas (including evacuation, control, reporting to authorities as well as identification and determination of hazardous area), (iii) cessation of contamination on the source (production process must be stopped, all activities around the area must be suspended, mitigation measures reported to authorities) and/or (iv) other measures according to science and technology. Anyone producing or handling B3 waste are also required to enact an emergency preparedness and response system.[192] The system must provide adequate (i) infrastructure (which includes facilities, equipment, coordination, organisation, procedures and training) and functions (identification, reporting, activation, mitigation, emergency protection, information dissemination and protection of local communities).

[186] GR 101/2014Article 148(1)
[187] GR 101/2014Article 149(1)
[188] Article 147 (1)
[189] Article 153(1)
[190] Article 25 GR No. 74/2001
[191] Article 26 GR No. 74/2001
[192] GR No. 101/2014, Article 220

4.14. Occupational Health and Safety

General framework regarding occupational health and safety is regulated under Government Regulation No. 50/2012 on the Implementation of Work, Health and Safety System Management System. It obliges every company to implement the Work, Health and Safety

Notation	The name of chemical substances and CAS number	NAB (Treshold Limit Value)		PSD /KTD		Molecular Weight	Note
		BDS	Mg/m3	BDS	Mg/m3		
*	DDT (50-29-3)		1; A3			354,50	Liver damage
*	Dieldrin (60-57-1)		0,25;A4			380,93	Skin, Liver and Kidney Damage
*	Endosulfan, benzoepin 115-29-7		0,1;A4			406,95	Skin, Central nervous disorder, Headache
*	Endrin		72-20-8			380,93	Skin, Liver damage
	Heksaklorobenzen (118-74-1)		0,002			284,78	Porphyrin effect, Skin damage, damage to nervous system
	Heptaklor (76-44-8) and Heptaklorepoksida (1024-57-3)		0,05;A3			373,32 389,40	Skin
	Poliklorodipenil (42% chlorine) 53469-21-9		1			266.50	Liver damage, Upper respiratory tract irritation, Cloracne
	Poliklorodipenil (54% chlorine) 11097-69-1		0,5			328.40	Liver damage, Upper respiratory tract irritation, Cloracne
	Toxaphene						Skin, reproduction

System Management System or known as SMK3 (*Sistem Manajemen Keselamatan dan Kesehatan Kerja*)[193]. The obligation applies to companies that are employing minimum 100 workers or having high level of potential danger[194]. The SMK3 covers: a) Health, Safety, Environment (HSE) policy stipulation, b) HSE plan, c) HSE performance evaluation and monitor; d) HSE performance improvement and review[195].

One of the main regulations, which relates to the PCBs exposure and occupational health is the Minister of Manpower and Transmigration Regulation No. 13/MEN/X/2011 regarding Threshold Value of Physic and Chemical in the Work Place. The regulation requires the management (of the company) to control the threshold value of physic and chemical in the work place. The regulation provides detailed threshold value of the physical and chemical factors in the work place. Attachment II of the regulation covers the threshold value several POPs including PCBs as follows:

[193] Article 5(1)
[194] Article 5(2)
[195] Article 6 (1) GR No. 50/2012

Note:

- PSD (*Paparan Singkat Diperkenankan)* means Short Term Exposure Limit. It is the level of chemicals in the air in the workplace, which should not be exceeded. Therefore, the workers are exposed to a brief period, not more than 15 minutes, can accept such exposure without having irritation, tissue damage or sedated. This exposure cannot be done more than four times in one working day.
- *Bagian Dalam Sejuta* (BDS) means Part Per Million (ppm). It is concentration of gas or steam from contaminated air
- *Kadar Tertinggi Diperkenankan* (KTD) means Maximum Allowable Concentration. It means the highest chemical concentration in the workplace that cannot that cannot be surpassed. yang selanjutnya disingkat
- *Nilai Ambang Batas* (NAB) means Treshold Limit Value. It is a standard of hazard factor in the workplace as a level/time weighted average that a worker can be exposed without health effects in a daily working day not more than 8 hours a day or 40 hours in a week.
- Chemicals that has higher Threshold Limit Value than Permissible Exposure Limit from OSHA or limit suggested by NIOSH
- Identity of chemicals from other sources or proven to be carcinogenic for human

In addition, Minister of Manpower and Transmigration, Decree No. 187/Men/1999 regulates the Management of Hazardous Chemicals in the Workplace. The management (of the company) is responsible to manage the hazardous chemicals the workplace. The control of the chemicals can be done through: the provision of MSDS and labelling, and the assignation of safety and health officer and chemical expert. The decree provides detailed information regarding information should be available in MSDS and the label. Attachment III of the Decree provides the lists of threshold limit quantity (*Nilai Ambang Kuantitas*) of the hazardous chemical. It includes one of POPs but not PCBs as follows:

Name and Threshold Limit Quantity of Hazardous Chemicals

II. Very Hazardous		
No	Name	Threshold Limit Quantity
92	2,3,7,8 –tetrachloro dibenzo-p-dioxin (TCDD)	1 kilogram

PCB contaminated oil are flammable. Therefore, it is relevant to identify regulations that relate to the fire prevention at the workplace and urban areas. Some of the regulations are:

- **Minister of Manpower and Transmigration Regulation No. 186/MEN/1999 on Fire Fighting Units in the Workplace.** The regulation consists of 6 chapters, 17 articles and 2 attachments. The divisions of the chapters are as follows:

  - **Chapter I: General provision.** The chapter provides explanation regarding the general term and requirements that the employer shall prevent, reduce, extinguish fire and carry out fire prevention training at the workplace[196]. The duties to prevent, reduce

[196] Article 2 (1) Regulation No. 186/MEN/1999

and extinguish fire at the workplace constitutes among other: controlling every form of energy, controlling smoke, heat and gas at the workplaces, forming the fire protection units at the workplaces, performing training and rehearsals on fire prevention periodically, having a plan book regarding fire prevention for emergency situation for a workplace with more than 50 workers and/or workplaces with medium and high fire risk potencies[197].

- **Chapter II: Formation of fire prevention unit.** The fire prevention units in general consist of: fire role officials, fire prevention teams, coordination of fire prevention units; work safety and health experts as the technical underwriter[198]. The chapter is also classifies the fire hazard potency level which consist of: light fire hazard potency level, light medium I fire hazard potency level, light medium II fire hazard potency level, light medium III fire hazard potency level and heavy fire hazard potency level[199].
- **Chapter III: Duty and the requirement for fire prevention unit.** The chapter provides detail provisions regarding duties and requirements of fire role officials, fire prevention teams, coordination of fire prevention units; work safety and health experts[200].
- **Chapter IV: Supervision.** The manpower supervisor (at the company) supervises the implementation of the regulation[201].
- **Chapter V: Transitional provision.** The existing fire prevention unit must be adjusted to the requirements under this regulation maximum one year after the stipulation of Regulation No. 186/MEN/1999 (by the year of 2000)[202].
- **Chapter VI: Closing provision.** The regulation shall take effect on the stipulation date (29 September 1999)[203].
- Minister of Public Works Regulation 20/PRT/M/2009. This document regulates fire norm in urban areas ("Fire Regulation"). The Fire Regulation require appropriate documentation in ground plan and site-map, concerning areas where Hazardous Materials are stored.[204] Furthermore, Fire Regulation require Hazardous Materials Safety Plan to be invoked by building management.[205] Chambers or rooms which should not be suppressed by water following a fire incident must be properly documented and communicated to building inspectors and fire officers.[206] The Fire Regulation contained detail standard and conditions on the treatment of flammable materials, building design and fire management ("*Manajemen Proteksi Kebakaran"* or "MPK"). Fire Regulation, to the extent applicable, may also require fire drill to be exercised.

[197] Article 2 (2) Regulation No. 186/MEN/1999
[198] Article 5 Regulation No. 186/MEN/1999
[199] Article 4(1) Regulation No. 186/MEN/1999
[200] Article 7 to 10 Regulation No. 186/MEN/1999
[201] Article 15 Regulation No. 186/MEN/1999
[202] Article 16 Regulation No. 186/MEN/1999
[203] Article 17 Regulation No. 186/MEN/1999
[204] Peraturan Menteri Pekerjaan Umum Nomor. 20 Tahun 2009 Tentang Pedoman Teknis Manajemen Proteksi Kebakaran di Perkotaan. See Chapter III, para 1.2 also Chapter 3 Part 6b.
[205] ibid. See Chapter IV part 4.3
[206] ibid. See attachment 4

5. Environmental Standards and Product Standards

5.1. Air Quality

GR No. 41/1999 on Air Quality Control does not include PCB emission in the air quality standard. In addition, Minister of Environment Decree No. Kep-13/MENLH/3/1995 on the Emission Standard for Cement Industry does not include the PCBs parameter. The parameters used for the kilns are the total particle, NO_2, and SO_2.

5.2. Water Quality

In terms of water, GR No. 82/2001 on Water Quality and Pollution Control regulates the water quality standard for POPs (*aldrin, chlordane, dieldrin, endrin, heptachlor, toxaphene*, dan DDT). However, it does not cover PCBs.

Kep-03/BAPEDAL/09/1995 regarding Technical Requirements for Hazardous and Toxic Waste Treatment and Kep-04/BAPEDAL/09/1995 regarding Procedures and Requirements for Disposal of Treated Hazardous and Toxic Waste Treatment and ex-Landfill Sites regulate waste water quality standard for the industrial B3 waste treatment which includes POPs (PCBs, PCDFs and PCDDs) as follows[207]:

Parameter	Maximum Concentration	
	Value	Unit
Physics		
Temperature	38	^oC
Etc		
Chemical		
Aox	0,5	mg/l
PCBs	0,005	mg/l
PCDFs	10	mg/l
PCDDs	10	mg/l
Etc		

In addition, based on Kep-04/BAPEDAL/09/1995, one of the requirements for the B3 waste that can be disposed in the landfill is that it must not contain PCBs.

5.3. Limit Values for PCBs in Food and Human Bodies

At present we found no regulatory standard in Indonesia.

5.4. Standards to Determine Land Contamination

GR No. 101/2014 attachment V lists the standard value regarding toxicity characteristics through TCLP and total concentration to determine the management of land contaminated with hazardous and toxic waste. The standard includes the PCBs as follows:

[207] Tabel 4 Baku Mutu Limbah Cair Kegiatan Pengolahan Limbah Industri B3 (BMLCK-PPLIB3) Kep-03/BAPEDAL/09/1995, Tabel 5 Tabel 4 Baku Mutu Limbah Cair Kegiatan Pengolahan Limbah Industri B3 (BMLCK-PPLIB3) Kep-04/BAPEDAL/09/1995

Pollutants	TCLP-A	TK-A	TCLP-B	TK-B	TCLP-C	TK-C
Unit (dry weight)	mg/L	Mg/kg	mg/L	mg/kg	mg/L	mg/kg
Polychlorinated biphenyls	N/A	50	N/A	2	N/A	0,02

TCLP and Total Concentration to Determine the Management of Land Contaminated with B3 Waste

5.5. Product Standardisation

Indonesian National Standard (SNI) aims to increase the quality, production efficiency and business competition as well as to protect consumers and other stakeholders in relation to their health, environment, and safety[208]. At present, there is no standardization regarding PCBs in electrical and electronic equipment and/or products based on Indonesian National Standard (SNI).

SNI can be applied on voluntary and mandatory basis. In terms of voluntary scheme, various stakeholders such as business actors, ministries and/or agencies, and/or regional government can implement it[209]. In this case, the stakeholders can apply for a certification to the accredited LPK[210] and the LPK will grant the certificate to the applicant[211]. After the certification is granted, the business actors are obliged to attach SNI or conformity sign in the product and/or package[212]. It is forbidden to attach SNI number that is different from the number written in the certificate. It is also forbidden to attach the SNI or conformity sign in the product when the certificate is no longer valid, revoked or frozen.[213]

SNIs which becomes mandatory should be stipulated by the relevant minister regulation or agency (non-ministry) in the event that there is a necessity in relation to the safety, security, health and environmental protection[214]. Several regulations which relates to the mandatory SNI are:

- Law No. 20/2014 on Standardisation and Conformity Evaluation;
- GR No. 102/2000 regarding National Standardisation;
- Minister of Trade Regulation No. 14/M-DAG/PER/3/2007 regarding Trade Standardisation on Trade and SNI Mandatory Supervision for the Traded Goods and Services, and its amendments (Minister of Trade Regulation No. Minister of Trade No. 14/M-DAG/PER/3/2007 and No. 47/M-DAG/PER/8/2014);

The formulation of SNI in planned within National Program for Standard Formulation/ PNPS (*Program Nasional Perumusan Standar*). National Standardisation Agency/*Badan Standardisasi Nasional* (BSN) forms a technical committee. The committee consists of national

[208] Article 3 Law No. 20/2014
[209] Article 21 (1) Law No. 20/2014
[210] Article 21(2) Law No. 20/2014
[211] Article 21(3) Law No. 20/2014
[212] Article 22 (1) Law No. 20/2014
[213] Article 22 (2) (3) Law No. 20/2014
[214] Article 24 (1) Law No. 20/2014

government/regional government, business actors/relevant associations, consumers/relevant associations and experts/academicians[215]. After the committee formulates SNI draft, the BSN will conduct a pooling. In the SNI draft formulation process[216], the public can participate by providing recommendations and input in the SNI formulation process, seek information for the SNI implementation, developing a standard culture and reporting any misuse/fraud of SNI certificate to the relevant institutions[217]. The draft SNI will be stipulated based on the head of BSN decree[218].

It is possible for Indonesia to formulate SNI for electrical and electronic equipment and/or products that are not containing/contaminated with PCBs. Furthermore, in the induction meeting the business sector is willing to commit to purchase and/or import PCBs free transformers.

On one meeting, participant raised several issue. What if the transformers purchased are claimed to be PCBs free but it fact they contain PCBs, and/or what if the information declared in MSDS sheet is different from the specifications? Does Indonesia have sufficient laboratory and equipment to examine if such products comply with the standard or not? The laboratory test is important besides tracking the history of transformers whether they are new or not (as a result of retrofilling). Also, what is the standard limit of PCBs oil concentration allowed in the transformer? Should it be totally free (0% of PCBs) or referred to the Basel Convention (below 50 ppm considered as PCBs free)? [219].

6. Institutional Arrangements

6.1. Specific Institutions

In Indonesia, some institutions are formed in order to assist the relevant Ministries to manage the B3 and/or B3 waste such as: Chemical Committee, B3 Commission and Pesticide Commission

The Chemical bill (dated 26 April 2012) establishes a chemical committee[220]. Its duties are:

- establishing and developing a data centre and national chemical inventory;
- identifying and analysing benefit-risk in the chemical management;
- identifying, researching and also providing recommendation for chemical disaster, chemical accident, chemical poisoning, and or chemical pollution. It also coordinating with the Badan Nasional Penanggulangan Bencana (BNPB) and other relevant institutions;
- conducting study pertaining to the risk of potential abuse and misuse of chemicals that can harm the safety and security through cooperation with the relevant institutions or parties abroad;

[215] Article 14 (3)(4) Law No. 20/2014
[216] Article 15 (1) Law No. 20/2014
[217] Article 52 Law No. 20/2014
[218] Article 17 Law No. 20/2014
[219] Induction Meeting, Serpong, 24 Febaruary 2016
[220] Article 45 of the draft law

- conducting consultancy to develop chemical substance and its derivatives products in order to increase added value and competition;
- preparing preparatory program on human resources development and capacity through chemical management training.

The Ministry of Trade is responsible to regulate the Chemical Committee and its role, duties, coordination mechanisms and its relation to the relevant parties. Further provisions regarding the chemical committee will be regulated under the Government Regulation.

GR 74, on the other hand, mandates the establishment of B3 Commission. The B3 Commission is an independent body. The functions of the commission are providing recommendation and consideration to the Government regarding the management of B3 in Indonesia[221]. The commission may consist of several sub commissions, one of them can be the Pesticide Commission[222]. The members of commission are representatives from relevant authorities, responsible agencies, university, environmental organisations and associations. The structure of commission's membership, responsible and its role will be stipulated further thorough a Presidential Regulation[223]. In the event that a person wants to import new type of B3, the person is required to follow notification procedures[224]. The notification is submitted by the authority of the exporting country to the responsible agency in Indonesia (in this case the Ministry of Environment and Forestry/MoEF)[225]. The responsible agency informs the committee in order to obtain consideration or recommendation[226]. Based on the recommendation or the consideration from the committee, the responsible agency proposes changes to the (current) attachment of the GR No.74/2001 and approves the agency that has authority in trade affairs to issue or reject an import permit[227]. However, such commission is not yet functional.

The responsible agency (MoEF) and relevant authorities, based on their functions are responsible to supervise activities related to B3[228]. In a specific conditions the supervision of B3 management can be given to the government at the Provincial/ Regency or City level and it is stipulated by the responsible institutions and/or authorized institutions[229].

6.2. Ministry of Environment and Forestry

In general, the duties of the Central Government regarding B3 and B3 waste management are stipulating national policy, norms, standards, procedures and criteria; stipulating and implementing policy regarding B3, waste and B3 waste[230].

[221] Article 21 (1) GR No. 74/2001
[222] Article 21 (2) GR No. 74/2001
[223] Article 21 GR No. 74/2001
[224] Article 9(1) GR No. 74/2001
[225] Article 9 (2) GR No. 74/2001
[226] Article 9 (3) GR No. 74/2001
[227] Article 9 (5) GR No. 74/2001
[228] Article 28 (1) GR No. 74/2001
[229] Article 28 (2) GR No. 74/2001
[230] Article 63 Law No. 32/2009

The responsible and authorized agencies are responsible to supervise the B3 management based on their respective duties.[231] In a specific case, the supervisory authority can be transferred to the Province/Regency/City in the event that the Province/Regency/Cuty Government has the capacity to supervise B3 management[232].

The governance of MoEF is regulated under Minister Regulation No. P.18/MenLHK-II/2015 regarding Organisation and Governance of MoEF. The main structure of the MoEF and its relevant divisions regarding B3 and B3 waste management can be found in the Attachment IV.

6.3. Local Government

Some of the duties and authorities of the Provincial Government which relate to the B3 and B3 waste management based on Law No. 32/2009 are: stipulating policies at the provincial level, supervising and assisting the implementation and compliance of business actors and/or activities to the environmental permit provisions and environmental regulations.

In terms of B3 management, the supervision related to B3 management is conducted by relevant institution. In a specific case, the monitoring authority can be transferred to be the Provincial/Regency/City affairs[233].

With regards to regional autonomy, the Ministry of Home Affairs has released a circular letter No. 660.2/2176/SJ on 28 July 2008 ordering local governments to be in charge of hazardous and toxic waste management in their jurisdiction. Their duties include monitoring, issuing permits and provide recommendations, etc. [234] In 2009, Law No. 32/2009 provides detailed provisions regarding the roles and responsibilities of Central and Regional governments.

We collected and analyses regional regulations in DKI Jakarta[235], Banten, East Java[236], and Yogyakarta[237] regarding B3 and B3 waste management. The regions are chosen based on the location of the inventories. Most of the regions have not yet formulate new regulation regarding B3 waste and their regional regulations still referring to the old B3 waste Government Regulation (GR No. 18/1999 jo. GR No.85/1999) which has been revoked. The anachronistic regulatory framework regarding B3 waste management at the local level is a challenge. In addition, local environmental agency (BLHD) also has issue regarding the number/qualification of human resources to handle the management of B3 waste at the regency/city level.

7. Gap Analysis and Recommendations

[231] Article 28 GR No. 74/2001
[232] Article 28(2) and its elucidation No. 74/2001
[233] GR No.74/2001
[234] Indonesian text is available at http://b3.menlh.go.id/bulletin/article.php?article_id=82
[235] Peraturan Gubernur Provinsi Khusus Ibukota Jakarta No.76/2009 tentang Pengelolaan Limbah Bahaya dan Beracun
[236] Peraturan Walikota Surabaya No.26/2010 Tentang Tata Laksana Perizinan dan Pengelolaan Limbah Bahaya dan Beracun
[237] Peraturan Walikota Yogyakarta No. 57/2010 tentang Izin Penyimpanan Sementara dan Pengumpulan Limbah Bahan Berbahaya dan Beracun

This chapter will summarize existing gap in the regulatory framework and provide recommendation for the government in addressing the issue. In general, the gaps identified can be grouped into five categories: (a) definition and concepts, (b) mechanism for POP listing, (c) sanctioning mechanism, (d) ESM and (e) institutional issue. **The more detailed descriptions on regulatory gaps and recommendation is described in Annex 1**.

(a) Definition and Concepts. Existing regulatory framework in lacking on specific definitions for substance, articles and mixtures. The current regime is focused on "substance" and in practice extends the term "substance" into mixture and articles. This may cause impediment in the enforcement of existing regulation. The notion of transformer or electrical equipment containing PCB as "substance" can be legally challenged. This can also hamper sectoral coordination – i.e. whether the importation of transformer should be categorized as substance under the rules of trade and import. In order to address this issue, existing regulatory framework must be amended so as to incorporate the concept of mixture and articles. This would mean some changes in Law and Government Regulation will be required. However, since the level of legislation that needs amendment is quite high, this will not be feasible in short-term. In the meantime, the practice of extending the interpretation of substance into articles and mixture can continue, but in the form of at least a ministerial regulation, with direct reference to laws which ratifies the POPs (Basel, Stockholm, Rotterdam) conventions.

(b) The list of POPs to be prohibited under international practice will continue to grow. This will require flexibility in national regulation. Unfortunately, under the existing system, adding the list of prohibited chemicals would require amending a Government Regulation. Another alternative is through the process involving hazardous and toxic substances commission (*Komisi B3*) but the legal framework is less clear on the technicalities of amendments even after *Komisi B3* approves the new list. Furthermore, the system involving Komisi B3 is currently not operational. Since Indonesia is already a party to the Stockholm and other convention, there is actually no need to involve another process in adding new POPs. We recommend that new POPs which are banned should be automatically included in the list of prohibited B3. This could be done by a Ministerial Regulation but some empowerment to do so would be required, at least in the form of legislation (Law or Government Regulation).

(c) Sanctioning mechanism is lacking, especially in terms of B3 management. At the moment, there is no sanction whatsoever for those who use and/or possesses B3 that is forbidden to be used. This could jeopardize the phasing out process since there is no (negative) incentive to comply. The only negative incentive is *ex*-post, when a contamination already occurred then strict liability will be implemented. However, this is not particularly helpful in terms of the phasing out process (registration, monitoring).

(d) ESM. The are some regulatory gaps in each stages of the ESM. In terms of registration – as mentioned earlier – there is no sanction for those refusing to register or mislead information about their PCB Ownership. For import, there is yet a specific sectoral rules prohibiting import. HS Code 2710910000 and 3824820000 (both PCB containing) are still active. We recommend that MoEF send formal letter to the Ministry of Finance and the Ministry of Trade. The latter should issue a PCB import ban in accordance with the Convention.

The other problem on ESM is with respect to waste storage. The time limit for storage is at maximum 90 days (for those above 50kg), however, since there is at present, no designated PCB treatment facility, this time limit is in practice, exceeded. It is difficult to change the time limit since GR 101 has to be amended. The government could exercise its discretion to extend the time limit, but this may trigger legal complications as elaborated above. Another option is to export the PCB waste but the procedure could be complicated.

Quality standard is another issue. At present the air quality regulation does not include PCB emission. The water quality standard regulates some POPs but not PCB. Both needs to be regulated by way of Government Regulation or Ministerial Regulation.

PCB can take the form of chemicals-in-products (such as in cables, paints). There is at present, no standard that obligates products to be PCB free. We recommend that the MoEF coordinates with the National Standardization Board (*Badan Standardisasi Nasional*) to create a mandatory national standard (SNI) number for PCB free products. This could refer to standards in the Stockholm Convention.

(e) Institutional Issue. At the national level, there is a lack of clarity on which unit does what in PCB Phasing-Out. We have conducted an analysis of MoEF units in terms of PCB phasing out and come up with recommendation on **Annex 5: Analysis of Task, Role and Function of MoEF Units in PCB Phasing Out**. Other issue includes inter-institutional coordination, especially on importation rules (with the Ministry of Trade), economic incentive (with the Ministry of Finance), Transportation (with the Ministry of Transport) and product standard (with the National Standardization Board). This needs to be immediately resolved by amending relevant regulations at each ministries, in accordance with PCB Official Guidance and Code of Practice.

At the regional level, there is a lack of capacity for PCB ESM at BPLHD (Regional Environmental Management Unit). Most regional regulations on B3/B3 waste ESM still refers to old rules which are incomplete and can be challenged. This can be overcome through a Ministerial Regulation on PCB Phasing Out.

Follow up:

As elaborated above, some of the recommendations may require amendment of higher legislations (Law/*Undang-Undang* and Government Regulation/PP). This recommendation is valid, not only for PCB, but also the phasing out of Persistent Organic Pollutants in general. As such, this research can be used as the basis of future phasing out plan for other POPs.

The PCB Official Guidance and the Code of Practice (after they are adopted) needs to be disseminated. PCB Owners would need to understand the legal implications of PCB ESM practice. Trainings would be required to fully implement the Code of Practice. However, this should be commenced only after the Government accommodates our recommendations into formal policy.

Finally, the Government of Indonesia may require technical expertise to accommodate these recommendations into legal products. Since the amendment of *Undang-Undang* or PP will require some time, to develop and enact. We recommend a transitional regulation in the form of Ministerial Regulation/Permen for PCB Phasing out. Nevertheless, not all recommendation

(especially those with respect to criminal sanctioning) can be incorporated into the Permen. The government may require technical expertise in identifying which parts that can be incorporated into a Permen; which ones are not and in conducting the legal drafting of the Permen.

8. Annexes

- **Annex 1 Recommendation for Regulatory Reform**
- **Annex 2 Existing Regulatory Framework**
- **Annex 3 PCB Official Guidance**
- **Annex 4 PCB Code of Practice (by Dr. Carlo Lupi)**
- **Annex 5 Analysis of Task, Role and Function of MoEF Units in PCB Phasing Out**
- **Annex 6 Recommendation for Regulation of Economic Incentive**