



# GEF-6 PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

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## PART I: PROJECT INFORMATION

Project Title:	Environmentally sound management and disposal of PCBs		
Country(ies):	Nigeria	GEF Project ID: <sup>1</sup>	9236
GEF Agency(ies):	UNDP (select) (select)	GEF Agency Project ID:	5720
Other Executing Partner(s):		Submission Date:	2015-07-30
GEF Focal Area(s):	Chemicals and Wastes	Project Duration (Months)	60
Integrated Approach Pilot	IAP-Cities <input type="checkbox"/> IAP-Commodities <input type="checkbox"/> IAP-Food Security <input type="checkbox"/>	Corporate Program: SGP	<input type="checkbox"/>
Name of parent program:	[if applicable]	Agency Fee (\$)	658,350

## A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES<sup>2</sup>

Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs)	Trust Fund	(in \$)	
		GEF Project Financing	Co-financing
(select) CW-2 Program 3 (select)	(select)	6,930,000	34,666,612
(select) (select) (select)	(select)		
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(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
Total Project Cost		6,930,000	34,666,612

## B. INDICATIVE PROJECT DESCRIPTION SUMMARY

Project Objective: Reducing Nigeria's population exposure to PCB effects and associated risks						
Project Components	Financing Type <sup>3</sup>	Project Outcomes	Project Outputs	Trust Fund	(in \$)	
					GEF Project Financing	Co-financing
1 Institutional capacity and training on PCBs	TA	1.1 Capacity of the local institutions and of operators on PCB management increased  1.2 Regulations on PCBs improved and	1.1.1 Strengthened capacity of local institutions on the implementation of PCB regulation and guidance  1.1.2 Training of operators on PCB identification, handling, transportation and disposal.  1.2.1 Regulations on PCBs drafted, enacted	GEFTF	300,000	2,779,635

<sup>1</sup> Project ID number will be assigned by GEFSEC and to be entered by Agency in subsequent document submissions.

<sup>2</sup> When completing Table A, refer to the excerpts on [GEF 6 Results Frameworks for GETF, LDCF and SCCF](#).

<sup>3</sup> Financing type can be either investment or technical assistance.

		enforced  1.3 Awareness raising and dissemination of project objectives and results	and enforced.  1.3.1. Access and participation of public and relevant stakeholders in workshops, media events, and publications related to the specific issues of PCBs ensured.			
2. Inventory of PCBs in 21 states of Nigeria not previously covered by other inventories	TA	2.1. Inventory of PCBs extended and demonstrated in 21 states not covered by previous inventories	2.1.1 Establishment of PCB analytical capacity, including upgrading of analytical equipment in one laboratory and training of technical staff  2.1.2 Sampling and analysis of at least 11,000 samples of oil from electrical equipment  2.1.3 Establishment of the PCB MIS for the 21 states covered by the inventory.	GEFTF	1,500,000	6,277,395

3. Establishment of PCB collection and treatment center	Inv	3.1 Technical infrastructures for the safe handling and disposal of PCBs established.	<p>3.1.1 Site selection for the PCB collection and treatment center</p> <p>3.1.2 Feasibility analysis, preliminary and final design of the treatment center, including logistic plan for transportation of PCB contaminated / containing equipment, storage facilities and disposal technologies</p> <p>3.1.3 Procurement and building of the PCB storage facility</p> <p>3.1.4 Procurement and testing of the PCB disposal/treatment technology</p> <p>3.1.5 Setting up the transportation and tracking system for PCB equipment and waste</p>	GEFTF	2,400,000	12,554,791
4. Environmentally sound disposal of identified PCBs	Inv	4.1 Disposal and treatment of PCBs and PCB contaminated equipment .	<p>4.1.1 Transport of PCB oil, PCB contaminated equipment, waste or contaminated oil to the treatment facility.</p> <p>4.1.2 Treatment of at least 1,500 tons of PCB contaminated equipment with BAT technologies, like chemical dehalogenation technologies</p> <p>4.1.3 Disposal of 200 tons of pure PCB equipment or PCB oil (i.e. arochlor or askarel transformers) through BAT / BEP thermal treatment and recycling of scrap metal</p>	GEFTF	2,200,000	12,554,791

5 Monitoring, Learning, Adaptive Feedback and Evaluation	TA	5.1 Project's results sustained and replicated	5.1.1. M&E and adaptive management applied to project in response to needs, mid-term evaluation findings with lessons learned extracted.  5.1.2. Lessons learned and best practices are disseminated at national level.	GEFTF	200,000	
.	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
Subtotal					6,600,000	34,166,612
Project Management Cost (PMC) <sup>4</sup>				GEFTF	330,000	500,000
<b>Total Project Cost</b>					<b>6,930,000</b>	<b>34,666,612</b>

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust funds here: ( )

#### C. INDICATIVE SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE, IF AVAILABLE

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount (\$)
Recipient Government	Federal Ministry of Environment	In-kind	500,000
Recipient Government	Federal Ministry of Power	In-kind	200,000
Recipient Government	Transmission Company of Nigeria (TCN)	In-kind	1,760,433
Recipient Government	Transmission Company of Nigeria (TCN)	Grants	350,890
Recipient Government	Nigeria Electricity Regulatory Commission (NERC)	In-kind	468,311
Private Sector	Afam Power Plc.	In-kind	418,000
Private Sector	Afam Power Plc.	Grants	5,456,112
Private Sector	Egbin Power Plc.	In-kind	678,977
Private Sector	Egbin Power Plc.	Grants	2,987,000
Private Sector	Kainji Hydro Electric Plc.	In-kind	222,806
Private Sector	Kainji Hydro Electric Plc.	Grants	4,343,098
Private Sector	Jebba Hydro Electric Plc.	In-kind	1,708,000
Private Sector	Jebba Hydro Electric Plc.	Grants	4,960,760
Private Sector	Sapele Power Plc.	In-kind	56,000
Private Sector	Sapele Power Plc.	Grants	2,978,662
Private Sector	Shiroro Hydro Electric Plc.	In-kind	2,112,000
Private Sector	Shiroro Hydro Electric Plc.	Grants	5,465,563
<b>Total Co-financing</b>			<b>34,666,612</b>

#### D. INDICATIVE TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS <sup>a)</sup>

GEF	Trust	Country/	Focal Area	Programming	(in \$)
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<sup>4</sup> For GEF Project Financing up to \$2 million, PMC could be up to 10% of the subtotal; above \$2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

Agency	Fund	Regional/ Global		of Funds	GEF Project Financing (a)	Agency Fee (b) <sup>b)</sup>	Total (c)=a+b
UNDP	GEFTF	Nigeria	Chemicals and Wastes	POPS	6,930,000	658,350	7,588,350
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
<b>Total GEF Resources</b>					6,930,000	658,350	7,588,350

a) Refer to the [Fee Policy for GEF Partner Agencies](#).

#### E. PROJECT PREPARATION GRANT (PPG)<sup>5</sup>

Is Project Preparation Grant requested? Yes ☒ No ☐ If no, skip item E.

#### PPG AMOUNT REQUESTED BY AGENCY(IES), TRUST FUND, COUNTRY(IES) AND THE PROGRAMMING OF FUNDS

Project Preparation Grant amount requested: \$					PPG Agency Fee:		
GEF Agency	Trust Fund	Country/ Regional/Global	Focal Area	Programming of Funds	(in \$)		
					PPG (a)	Agency Fee <sup>6</sup> (b)	Total c = a + b
UNDP	GEF TF	Nigeria	Chemicals and Wastes	POPS	150,000	14,250	164,250
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
<b>Total PPG Amount</b>					<b>150,000</b>	<b>14,250</b>	<b>164,250</b>

<sup>5</sup> PPG requested amount is determined by the size of the GEF Project Financing (PF) as follows: Up to \$50k for PF up to \$2m (for MSP); up to \$100k for PF up to \$3m; \$150k for PF up to \$6m; \$200k for PF up to \$10m; and \$300k for PF above \$10m. On an exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

<sup>6</sup> PPG fee percentage follows the percentage of the Agency fee over the GEF Project Financing amount requested.

## F. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS<sup>7</sup>

Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society	Improved management of landscapes and seascapes covering 300 million hectares	<i>Hectares</i>
2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)	120 million hectares under sustainable land management	<i>Hectares</i>
3. Promotion of collective management of transboundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services	Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins;	<i>Number of freshwater basins</i>
	20% of globally over-exploited fisheries (by volume) moved to more sustainable levels	<i>Percent of fisheries, by volume</i>
4. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO <sub>2e</sub> mitigated (include both direct and indirect)	<i>metric tons</i>
5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern	Disposal of 80,000 tons of POPs (PCB, obsolete pesticides)	<i>200 tons of PCBs + 1500 tons of PCB contaminated equipment metric tons</i>
	Reduction of 1000 tons of Mercury	<i>metric tons</i>
	Phase-out of 303.44 tons of ODP (HCFC)	<i>ODP tons</i>
6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks	Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries	<i>Number of Countries:</i>
	Functional environmental information systems are established to support decision-making in at least 10 countries	<i>Number of Countries:</i>

## PART II: PROJECT JUSTIFICATION

1. *Project Description.* Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, GEF focal area<sup>8</sup> strategies, with a brief description of expected outcomes and components of the project, 4) [incremental/additional cost reasoning](#) and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and [co-financing](#); 5) [global environmental benefits](#) (GEFTF) and/or [adaptation benefits](#) (LDCF/SCCF); and 6) innovation, sustainability and potential for scaling up.

### Global environmental problems, root causes and barriers that need to be addressed.

It is well known that the exposure to Persistent Organic Pollutants (POPs) can lead to serious health effects including certain cancers, birth defects, dysfunctional immune and reproductive systems, greater susceptibility to disease and damages to the central and peripheral nervous systems. The Stockholm Convention on POPs has been established based on the consideration that, given the long range transportation of POPs, no one government acting alone can protect its citizens or its environment from POPs.

PCBs are among the most toxic and persistent POPs listed in the Stockholm Convention. The so-called dioxin-like PCBs are characterized by a toxicity and environmental persistence which is very similar to the one of dioxin. PCBs

<sup>7</sup> Provide those indicator values in this table to the extent applicable to your proposed project. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the [GEF-6 Programming Directions](#), will be aggregated and reported during mid-term and at the conclusion of the replenishment period. There is no need to complete this table for climate adaptation projects financed solely through LDCF and/or SCCF.

<sup>8</sup> For biodiversity projects, in addition to explaining the project's consistency with the biodiversity focal area strategy, objectives and programs, please also describe which [Aichi Target\(s\)](#) the project will directly contribute to achieving.

have been recently re-classified as class 1 carcinogens by the International Agency for Research on Cancer (IARC). Although PCBs were mostly used in closed systems, like transformers and capacitors, very often these equipment are recycled at the end of their operational life and the PCB oil contained therein is either directly wasted in the environment, recycled, or even sold as fuel oil.

Based on the fact finding mission undertaken by UNDP experts during the PIF preparation, as well as on the review of the grey and academic literature, several barriers, which the project intends to address, hinder the effective management of PCBs in Nigeria and their removal from the Nigerian environment:

- There is still a lack of knowledge on how to manage PCB containing equipment in a way which prevents cross contamination and the spreading of PCBs in the environment
- The sampling of dielectric oil from electric equipment requires a strong involvement of the owners of these equipment, as it involves controlling the risk to operate on high voltage equipment, hidden costs deriving to power-off time, and coordination with electrical equipment maintenance plans.
- The regulation related to PCBs is not only related to waste, as PCB containing equipment should not be considered a waste if still in use, under maintenance or temporarily off-line. Therefore there is the need for a specific regulation covering both the status of PCBs as waste and as equipment, including obligations for PCB inventory.
- Owners of electric equipment would not be motivated to collaborate on inventory efforts in the absence of a clear regulatory framework and enforcement by the government.
- There is still a lack of knowledge on the technologies for the disposal of hazardous chemicals and waste. In Nigeria to date there are not yet incineration plants or other disposal facilities capable to fulfil the Stockholm Convention BAT/BEP criteria. A potential capacity for destroying hazardous chemicals through co-incineration in modern cement kilns is still unexplored.
- In Nigeria there is a complete lack of experience on the chemical technologies available for the removal and destruction of PCBs for low contaminated equipment, like dehalogenation technologies, which may result in environmental and economic advantages for the owners of PCB electrical equipment.

### **Baseline Scenario - PCBs**

***Regulation on PCBs in Nigeria.*** The National Policy framework on PCB management in Nigeria has been developed with the support of the GEF/WB project “PCB Management and Disposal Project (GEF ID 4100)” and adopted by the Federal Executive Council (FEC) during its meeting of 4th March 2015. However, a regulation on PCB inventory and disposal in Nigeria, with the necessary associated provisions for the industry and potential PCB owners to manage their PCB contained equipment, is still missing.

***PCB inventory in Nigeria.*** The NIP listed as a priority the need to undertake a serious effort to quantify the amount of PCBs in the country, as reliable information on the matter at the time of NIP preparation was missing. In 2009, a preliminary inventory of PCBs was undertaken with the bilateral support of Canada and implemented by the World Bank in 10 Nigerian states. During this inventory, the dielectric oil from 281 transformers was sampled and tested with screening test kits. Of these, 27 transformers resulted positive at the screening test. The chlorinated transformers were not labeled.

Under the GEF/WB “PCB management and disposal project”, 1746 pieces of equipment have been investigated for their content of PCBs in 15 states (Lagos, Oyo, Ogun, Delta, Rivers, Enugu, Anambra, Abia, Sokoto, Kaduna, Kano, Bauchi, Benue, Niger, Abuja) by means of expeditive semi-quantitative analysis (chlor-n-oil50). Out of these, 387 have been found contaminated, for an overall weight of 6,398 tons. In term of mass, the majority of the contaminated equipment (170, for an overall weight of 5,690 tons) were large power transformers, whilst only 708 tons of contaminated equipment were found in the remaining 217 pieces of equipment sampled. Therefore, the ratio of PCB contaminated mass / sampled mass was around 18% for power transformers and only 6.6% for all the other types of electrical equipment (distribution transformers, capacitors, circuit breakers, etc.). In terms of number of contaminated equipment, the ratio of PCB contaminated equipment / number of equipment sampled was instead around 23% for the power transformers and 21% for all the sampled equipment.

In term of PCB concentration, the samples found positive at the expeditive test were analyzed with a quantitative chlorine-based detector (Dexil Lx2000): out of the re-confirmed samples, only 6 samples were classified “high” or “pure PCB”, for an overall weight of around 85 tons; 7 were found contaminated at a concentration ranging from 1000 to 2500 ppm, for an overall weight of around 81 tons, and 79 were found contaminated at a concentration higher than 50 ppm, for an overall weight of around 1,720 tons. All the contaminated equipment have been labeled and can be therefore easily identified and tracked. All the remaining samples resulted within the Stockholm Convention limit of 50 ppm. This outcome also demonstrated the low reliability of qualitative expeditive tests like the Chlor-n-oil, which should be preferably replaced by quantitative tests, or by laboratory analysis.

***Availability of POPs disposal facilities in Nigeria.*** To date, in Nigeria there are no large incinerators or BAT/BEP compliant disposal facilities available for the safe disposal of hazardous chemical waste. The Gas-Phase Chemical Reduction plant in Minna is still under construction and its suitability for the disposal of POPs waste, once completed, will need to be properly assessed by design and conduction of proof of performance tests. There is a potential (still unexplored) disposal capability in terms of use of cement kilns. One large international operator owns an installed capacity of around 8,5 million t/yr of clinker, distributed over 4 Nigerian states. It has to be noted that cement kilns, due to their very high temperature and the long residence time of waste in the kilns, may be considered BAT/BEP compliant disposal technologies provided that the same are equipped with proper pre-treatment and storage facilities for hazardous waste. Cement kilns have been successfully used worldwide (for instance, by Holcim - Geocycle in Sri Lanka) for the disposal of PCB oil, and in Vietnam for the disposal of obsolete pesticides and POPs contaminated soil, under the GEF/ UNDP project "Building Capacity to Eliminate POPs Pesticides Stockpiles" - GEF ID 3105.

### **Baseline project - PCBs**

The preliminary inventory carried out under the Canadian-Nigerian cooperation investigated 10 states. That inventory provided a first evidence of the presence of PCBs in the electrical sector, however had a very limited scope and carried out the sampling of a small number of pieces of equipment, which were not labeled for future management. Subsequently, the GEF/World Bank project set up and demonstrated a more comprehensive – though still limited - inventory in 15 Nigerian states. The amount of samples taken in each state is obviously not exhaustive, as only around 115 pieces of equipment were sampled in each state as an average. A sound inventory for the identification and labeling of PCB contaminated equipment has therefore to be continued in the states where the GEF/WB project initiated the inventory, and carried out in the remaining 21 states, which include some highly industrialized states.

The main purpose of the GEF/WB project was to identify and safeguard PCB contaminated equipment for future treatment and disposal. However, disposal of PCBs is not envisaged by that project. To date, there are no ongoing decontamination or disposal activities of PCB contaminated equipment in Nigeria.

### **The proposed alternative scenario with a brief explanation of expected outcomes and components.**

The alternative scenario proposed has been designed to reinforce and integrate the country baseline project with the general purpose to ensure the fulfilment of the Stockholm Convention on POPs and contribute to the phasing out of obsolete PCB contaminated / containing equipment and treatment of PCB contaminated equipment which is still in use or which still has a significant residual life.

The alternative scenario envisages 4 components, which are outlined below, and which will be designed with more details during the project preparation stage:

#### **Component 1. Institutional capacity and training for PCBs.**

Under this component, the following three outcomes will be achieved:

- Outcome 1.1 Capacity of the local institution and of operators on PCB management increased
- Outcome 1.2 Regulation on PCBs drafted, enacted and enforced



- Outcome 1.3 Awareness raising and dissemination of project objectives and results

On training and capacity building (Outcome 1.1), considering that drafting of guidance and training have been already carried out during the PCB management GEF project implemented by the World Bank, guidance documents and training delivered during that project will be updated and replicated for the local institutions in the 21 provinces where the PCB inventory is planned.

The document “National Policy Framework on PCB Management in Nigeria, September 2014”, endorsed by the Ministry of Environment, will be adopted as the main regulatory document for PCBs and used as the starting point for training of the local institutions and operators (Output 1.1.1 Capacity of local institutions on the implementation of PCB regulation and guidance).

On guidance and training on technical issues (Output 1.1.2 Training of operators on PCB identification, handling, transportation and disposal) the project will build on successes and lessons learned during the implementation of the GEF/WB project. As far as **Training and guidance on sampling** is concerned : due to the large number of samples envisaged for the proposed project (around 11,000 samples which significantly will expand the 1,800 sample inventory carried out during the GEF/WB project) a change of strategy would however be necessary. More specifically, the training for sampling operators will not include training on qualitative PCB analysis to be carried out on site. Indeed, to speed up operations and increase reliability of testing, instead of on site quick tests to be performed during sampling operations, the testing of samples will be centralized. The training will therefore focus on equipment sampling and will be delivered to a large number of potential owners of PCB equipment that will act under the coordination of the project. As to **Training and guidance on PCB analysis**: In addition, as the PCB analysis will be centralized in one or two laboratories, training will be carried out on the use of quantitative screening methodologies integrated by confirmative detailed analysis by Gas Chromatograph (GC)/Electron Capture Detector (ECD). This will result in a greater accuracy of the results and in cost savings.

Guidance and training will be also provided for handling, storage and transportation in compliance with the Basel Convention and ADR rules (on transportation of dangerous goods by road) and for the the selection of the Stockholm Convention compliant disposal technologies (dehalogenation, dismantling and disposal) taking into account a cost/benefit analysis based on the residual life of the PCB contaminated equipment.

On the regulatory issue (Outcome 1.2), the project will also build on the work undertaken by the GEF/WB project. More specifically, the policy developed under the GEF/WB project will be used as a basis for drafting the Nigerian regulation on PCBs, after the necessary revisions and updates. The proposed regulation will include PCB definition, obligation for the industrial sector on reporting on PCB contaminated equipment, reciprocal obligations of state administrations and federal administration, rules on analytical methodologies, rules on PCB equipment maintenance and phasing out. The project will also ensure proper communication with relevant stakeholders (Outcome 1.3), by arranging communication events and preparing documents aimed at raising awareness on the Stockholm Convention, the POPs, and more specifically the PCB issue. The access and participation of public and relevant stakeholders in workshops, media events, and publications related the specific issues of PCBs will be ensured (output 1.3.1).

This component will be co-financed by institutions of the government of Nigeria, for an overall amount of USD 3,279,635, as per following:

Federal Ministry of Environment. In Kind: USD 500,000

Federal Ministry of Power. In Kind: USD 200,000

Transmission Company of Nigeria (TCN). In Kind: USD 1,760,434

Transmission Company of Nigeria (TCN). Grants: USD 350,890

Nigeria Electricity Regulatory Commission (NERC). In kind: USD 468,311

**Component 2. Inventory of PCBs in 21 states of Nigeria not previously covered by other inventories.** To carry out the PCB inventory there will be the need to establish the proper PCB analytical capacity, including upgrading of analytical equipment in one laboratory and training of technical staff (output 2.1.2) Based on recent statistics provided by the Nigerian Electric Distribution company (personal communication during the fact finding mission of UNDP in Nigeria, July 2015), in Nigeria the overall number of distribution transformers is 126,313, whilst in the transmission sector there are 7 transformers in the size of 330/132 KV, 285 transformers in the size of 132/33 KV, 456 circuit breakers of 330 KV, 732 circuit breakers of 132 KV, and 953 circuit breakers of 33KV. The project

cannot obviously sample and analyze all the equipment to assess for their PCB content. However, oil from a large fraction of these equipment summing up to at least 11,000 will be sampled and analyzed. This will require a very sound inventory organization. During the first 6 months of project implementation the PCB inventory team in each state will be therefore trained on all the technical aspects related to inventory like sampling, labeling, quality assurance and checking, chain of custody procedures, data management, analysis. The conduction of the inventory will span for at least 2 project years and will overlap with the activities related to the upgrading of storage and PCB disposal which will start at the end of the 1<sup>st</sup> year of project implementation (output 2.1.2). The inventory data will be entered in a PCB Management information system (MIS), which will be designed during the first 6 months of project implementation and made operational before the start of the sampling and analysis activities (output 2.1.3).

It is planned that this component will be co-financed by private companies in the electric power sector for an overall amount of USD 6,277,395, as per the following:

Afam Power Plc. In kind: USD 83,600  
Afam Power Plc. Grants: USD 1,091,222  
Egbin Power Plc. In kind: USD 135,795  
Egbin Power Plc. Grants: USD 597,400  
Kainji Hydro Electric Plc. In kind: USD 44,561  
Kainji Hydro Electric Plc. Grants: USD 868,619  
Jebba Hydro Electric Plc. In kind: USD 341,600  
Jebba Hydro Electric Plc. Grants: USD 992,152  
Sapele Power Plc. In kind: USD 11,200  
Sapele Power Plc. Grants: USD 595,732  
Shiroro Hydro Electric Plc. In kind: USD 422,400  
Shiroro Hydro Electric Plc. Grants: USD 1,093,112

**Component 3. Establishment of PCB collection and treatment center.** Under this component, a safe storage site (either developed from the upgrading of an existing storage site, or erected as a completely new structure) will be established for the collection and treatment of the PCBs identified during the implementation of Component 2.

The GEF/WB project which, during the drafting of this proposal, is in its last months of implementation, included an activity related to the upgrading of storage facilities for the temporary storage of PCB contaminated material pending their disposal.

The proposed project instead does not envisage the upgrading or creation of temporary storage facilities to be used only for accumulation and transportation purposes in each state. The collection and treatment center is intended as the final stop for the handling and treatment of high and low contaminated PCB equipment before either their treatment or their shipment to destruction facilities.

This strategy is based on the consideration that: 1) on line contaminated equipment must be kept under control by their owner which are liable for the integrity of these equipment; it is easier and more effective to provide technical assistance to PCB owners so that they can take the necessary measures to prevent contamination; 2) small intermediate storage facilities require surveillance, investments and are “per se” a source of risk which has to be avoided, 3) the throughput capacity of the disposal centre will guide the rate with which contaminated equipment stored or on line will be mobilized and transported, and 4) a sound transportation plan, with planned and well arranged “stop” areas along the journey, will ensure that risks due to domestic road transportation of PCBs until their final destination are kept under control.

The selection of the site for the collection and treatment center (output 3.1.1) will be based on environmental, logistical and social considerations. In principle, areas located within / in the vicinity of large electrical infrastructures (power distribution stations, power plants) will be considered. The collection and treatment center will have connection to the required utilities (electricity, water) and will be close to the main transportation network (highways and / or railways) to facilitate transportation of the PCB equipment and waste. The proper environmental permitting in compliance with the Nigerian law on the protection of the environment will be carried out.

Based on the results gained during the preceding inventories, as well as from the preliminary results of this project's inventory, feasibility analysis and preliminary design of the treatment center will be carried out (output 3.1.2: Feasibility analysis, preliminary and final design of the treatment center, including logistic plan for transportation of the transformers, storage facilities and disposal technologies). That will encompass identifying the required capacity for pre-treatment, treatment and storage, drafting a preliminary layout of the center, identifying suitable mobile or fixed decontamination technologies and their requirements in term of electricity, water and chemicals consumption, management of secondary waste, ancillary equipment. The feasibility analysis will generate the technical specifications for the procurement of ancillary technologies, infrastructures (output 3.1.3 ) and disposal technologies or services (output 3.1.4)

Concerning the selection of technologies or services for the disposal / treatment of low-contaminated PCB equipment, the project will pursue the following approach to minimize risks:

Option 1) low-contaminated transformers (PCB concentration < 5000 ppm) will be preferably de-contaminated by renting/purchasing a dehalogenation unit (whichever is the lowest cost). Dehalogenation technologies are a class of quite consolidated processes, commercially available both as large, fixed facilities or relatively small mobile units that could be rented. This process allows for the recovery of clean mineral oil after the PCB contained in that oil is extracted and destroyed and the mineral oil reprocessed, with a net saving in the order of US\$ 2,000 to 3,000 per ton of oil recovered. Therefore this option is the most attractive for the electric power and distribution industry wanting to preserve the capital asset of relatively new transformers, ensuring at the same time the destruction of PCBs. Old transformers at the end of their operational life, can still be treated by means of dehalogenation if the PCB concentration is not high. The decontaminated carcasses can be sold as steel scrap and the oil recovered after decontamination, whilst other solid waste (impregnated wood and cardboard) need to be thermally processed. Obviously, only technologies compliant with Basel and Stockholm guidance documents, and STAP guidance document on technology selection, will be selected for the disposal of the PCB waste identified in the project. More specifically, for PCB dehalogenation, it is herein meant the fully commercial PCB dehalogenation technologies falling in the family of "Alkali Metal/ Metal Hydroxide Reduction (Sodium Reduction, A-PEG)", classified by the STAP as *"Fully commercial and well established with multiple technology vendors and stable licensee arrangements capable of competitive tendering worldwide."* (please see the STAP guidance document "Selection of Persistent Organic Pollutant Disposal Technology for the Global Environmental Facility" available at: <https://www.thegef.org/gef/pubs/STAP/selection-persistent-organic-pollutant-disposal-technology-gef.>)

Option 2) highly contaminated transformers (PCB concentration tentatively higher than 5000 ppm) will be either sent abroad for disposal, or disposed locally by identified thermal technologies (i.e. cement kilns) provided that the full chain of dismantling, draining and destroying of PCB oil can be established and tested for its environmental performance and compliance with the Stockholm Convention BAT/BEP criteria.

Option 3) as an alternative, also the low contaminated transformers (option 1) with a PCB concentration in their dielectric oil not higher than 5000 ppm - can be treated based on the procedure identified in option 2, if no vendor of dehalogenation technology can be identified through the bidding process.

Once the technologies have been identified and technology, service and infrastructures are being procured, the transportation plan and the tracking system for PCB equipment and waste will be designed and implemented (output 3.1.5).

In addition to the above, a logistic plan for either the transportation of PCB contaminated equipment to the treatment center, or mobilization of mobile decontamination plants to the transformer sites will be drafted (also part of output 3.1.5).

Tentatively, this component will be co-financed by private sector electric power companies for an overall amount of USD 12,554,791, as follows:

Afam Power Plc. In kind: USD 167,200  
Afam Power Plc. Grants: USD 2,182,445

Egbin Power Plc. In kind: USD 271,591  
 Egbin Power Plc. Grants: USD 1,194,800  
 Kainji Hydro Electric Plc. In kind: USD 89,122  
 Kainji Hydro Electric Plc. Grants: USD 1,737,239  
 Jebba Hydro Electric Plc. In kind: USD 683,200  
 Jebba Hydro Electric Plc. Grants: USD 1,984,304  
 Sapele Power Plc. In kind: USD 22,400  
 Sapele Power Plc. Grants: USD 1,191,465  
 Shiroro Hydro Electric Plc. In kind: USD 844,800  
 Shiroro Hydro Electric Plc. Grants: USD 2,186,225

**Component 4. Environmentally Sound Management (ESM) of PCBs** Once the needed infrastructures and technologies have been procured and tested, the treatment of low-contaminated PCB equipment and pure PCB will be undertaken ensuring that the activities of PCB disposal will be carried out in compliance with BAT/BEP and at the best cost/effectiveness ratio. It should be noted that under the GEF/WB project, already 1800 tons of PCB contaminated equipment and 85 tons of pure PCB equipment (containing Askarel or similar) have been identified and secured for future disposal. The presence of this equipment will need to be checked at PPG stage, so that the disposal activities can start in the early stage of project implementation, without waiting for the result of the extended PCB inventory. The PCB equipment and waste to be treated will be transported to the collection and treatment center (output 4.1.1). The disposal of at least 1,500 tons of PCB contaminated equipment (output 4.1.2) as well as 200 tons of pure PCB equipment (output 4.1.3) will be carried out.

Tentatively, this component will be co-financed by private sector electric power companies for an overall amount of USD 12,554,791, as follows:

Afam Power Plc. In kind: USD 167,200  
 Afam Power Plc. Grants: USD 2,182,445  
 Egbin Power Plc. In kind: USD 271,591  
 Egbin Power Plc. Grants: USD 1,194,800  
 Kainji Hydro Electric Plc. In kind: USD 89,122  
 Kainji Hydro Electric Plc. Grants: USD 1,737,239  
 Jebba Hydro Electric Plc. In kind: USD 683,200  
 Jebba Hydro Electric Plc. Grants: USD 1,984,304  
 Sapele Power Plc. In kind: USD 22,400  
 Sapele Power Plc. Grants: USD 1,191,465  
 Shiroro Hydro Electric Plc. In kind: USD 844,800  
 Shiroro Hydro Electric Plc. Grants: USD 2,186,225

### **Incremental/additional cost reasoning and co-financing**

<b>1 Institutional capacity and training on PCBs.</b>	
Baseline scenario and project	Alternative scenario with GEF support
The “National Policy Framework on PCB Management in Nigeria, September, 2014” developed under the WB project, has been endorsed by the Federal Ministry of the environment. A legislative framework on PCBs is still missing in Nigeria.	The national regulation on PCB management and disposal will be drafted and proposed for approval to the federal government. Standards for the treatment of PCB contaminated equipment and oil will be established;
Tentative Co-financing: USD 2,779,635	Requested GEF grant: USD 300,000
<b>2. Inventory of PCB in 21 states of Nigeria not previously covered by other inventories</b>	
Baseline scenario and project	Alternative scenario with GEF support
The preliminary inventory carried out under the Canadian-Nigerian cooperation investigated 10 states. That inventory provided a first evidence of the presence of PCBs in the electrical sector, however had a very limited scope and envisaged the sampling of a very limited number of pieces equipment, which were not labeled for future management. Subsequently, the GEF/World Bank project set up and demonstrated a more comprehensive – though still limited - inventory in 15 Nigerian states. The amount of samples taken in each state is obviously not exhaustive, as only around 100 pieces of equipment were sampled in each state	With the GEF support, PCB inventory will be carried out in the remaining 21 states of the country. 11,000 equipment will be sampled and analyzed for their PCB concentration. The government will continue to support the PCB inventory in the 15 states where the baseline inventory has been carried out under the World Bank project.
Tentative co-financing: USD 6,277,395	Requested GEF Grant: USD 1,500,000
<b>3. Establishment of PCB collection and treatment center.</b>	
Baseline scenario and project	Alternative scenario with GEF support
The main purpose of the GEF/WB project was to identify and safeguard PCB contaminated equipment for future treatment and disposal. However, the disposal of the identified PCBs was not among the objectives of that project. The identified PCB contaminated equipment already safeguarded, including the Askarel containing equipment and the equipment and oil cross-contaminated by PCBs will not be safely disposed or treated	One treatment center, including pre-treatment facilities and a technology for the chemical treatment of equipment or oil contaminated by PCBs, will be established with the target to treat at least 1500 tons of PCB contaminated equipment. At least 200 tons of equipment containing pure PCB oil will be disposed of.
Tentative co-financing: 12,554,791	Requested GEF grant: 2,400,000
<b>4. Environmentally sound management of identified PCBs and waste.</b>	
Baseline scenario and project	Alternative scenario with GEF support

<p>The main purpose of the GEF/WB project was to identify and safeguard PCB contaminated equipment for future treatment and disposal. However, disposal of PCBs is not envisaged by that project.</p> <p>Co-financing budget: 12,554,791</p>	<p>Without GEF support the identified PCB stockpiles will not be disposed of with national resources, and the country will not develop the capacity to dispose future POPs stockpiles in an environmentally sound way. The project envisages to dispose of at least 200 tons of pure PCB equipment stockpiles and to treat 1500 tons of contaminated PCB equipment.</p> <p>GEF Grant budget 2,200,000</p>
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2. *Stakeholders.* Will project design include the participation of relevant stakeholders from [civil society](#) and [indigenous people](#)? (yes ☒ /no ☐ ) If yes, identify key stakeholders and briefly describe how they will be engaged in project design/preparation.

Key stakeholders were involved at project identification stage. These are: representatives from the Ministry of Environment, representatives from the Federal Ministry of Power and the Nigeria Electricity Regulatory Commission. Representatives from the following electric industries have been involved in the consultation to explain project objectives and agree on a preliminary commitment in project activities: Transmission Company of Nigeria (TCN); Afam Power Plc.; Egbin Power Plc.; Kainji Hydro Electric Plc.; Jebba Hydro Electric Plc.; Sapele Power Plc.; Shiroro Hydro Electric Plc.

3. *Gender Considerations.* Are [gender considerations](#) taken into account? (yes ☒ /no ☐ ). If yes, briefly describe how gender considerations will be mainstreamed into project preparation, taken into account the differences, needs, roles and priorities of men and women.

It is fully acknowledged that particular attention ought to be given to the connections between gender concerns and chemicals. Namely, women, men and children differ in their physiological susceptibility to the effects of exposure to toxic chemicals. Furthermore, women are particularly influenced by the adverse impact of the hazardous chemicals due to the structure of their reproductive systems. POPs and particularly PCBs are particularly harmful due to their capacity to accumulate in body fats and in breast milk, therefore representing a significant risk for women and infants. Usually, risk-based environmental standards and risk-based corrective actions, following a precautionary approach, are designed taking into account the highest risk for the most sensitive and exposed population categories, therefore environmental and toxicological limits already take into account the specific issue of women and infants. Nevertheless, specific awareness raising initiatives will be adopted to further reduce the risk of exposure of women and infants given their specific sensitivity. A particular attention to the gender dimension will be given during the evaluations of the project.

In addition to that, in the course of project design and implementation, UN policies on equal opportunities will be considered with the purpose to ensure that the project supports women's capabilities and their enjoyment of rights, and women's equal and meaningful participation as actors, leaders and decision makers.

4 *Risks.* Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable).

Risk type / Description	Severity	Countermeasure
Management: Difficulties arising from the coordination among administrations of different level (federal, state levels)	M	Representatives of different levels will be involved in the steering committee; the tasks of the Project Management Unit (PMU) will

		include to ensure communication with all the project partners; roles and composition of each project institution will be clarified and agreed since the inception of the project. UNDP CO will take a role in coordinating stakeholders in case of conflicts using its representative function where needed.
Financial: fluctuation of disposal service costs	M	UNDP has an outstanding experience in carrying out bids related to disposal services / procurement of disposal technologies, and is constantly monitoring the global disposal services, through regular international bidding, in the course of the implementation of POPs disposal projects worldwide.
Technical: Technical knowledge of local authorities is low.	L	Training events, workshops and awareness raising will be carried out to ensure that the local authorities are fully aware and knowledgeable of the environmental issues and solutions related to PCBs.
Climate change: Effect of climate change on project activities / infrastructures	L	In the course of the PCB inventory, the identified PCB equipment will be mapped, so that they can be prioritized even with reference to areas with significant hydrological risk, including due to changes in flood patterns in the country.
Management. Difficulties related to the improvement of the regulatory system within project timeframe.	L	The project intends to assist the relevant institutions (i.e. NAFDAC, NESREA) in drafting technical annexes, or amendment of existing regulations, which will be therefore approved with a procedure which is faster compared to the approval of a new or amended legislation.
Management: Difficulties related to the procurement of equipment or services.	L	UNDP has a worldwide consolidated experience in assisting countries for the procurement of equipment and services through both national and international bidding. Specific task will be dedicated since project inception to the understanding of all the permits and documentation required for national and international procurement.
Social: Risk associated with the security situation in some of the states of the Federal Republic of Nigeria.	M	The implementation of the project in risky areas will strictly follow the UN system security rules and procedures. In case of hazard scaling up in some project areas, the project activities will be suspended in that areas, or re-allocated to different areas if feasible.

5. *Coordination.* Outline the coordination with other relevant GEF-financed and other initiatives. The project will ensure coordination with the following GEF initiatives already under implementation:

- GEF 3804: Less Burnt for a Clean Earth: Minimization of Dioxin Emission from Open Burning Sources (UNDP, under implementation). The project will ensure cooperation with this project by building on its results and the good cooperation established, for example at the local government levels.

- GEF 4100: PCB Management and Disposal Project (WB, under implementation). The project will generate technical capacity related to the disposal of POPs which is a common objective with this PCB disposal project.
- GEF 5167: Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (POPs) (UNIDO, under implementation). The project will coordinate with the activities related to the inventory of PCBs, establishing mutual cooperation and exchange of information related to PCB containing equipment.

The project will build on the experience of GEF projects related to the same focal area already concluded. More specifically, meetings will be held with the experts and coordinators of the projects below, to understand success stories and lessons to be learned, and to gather any relevant information generated during these projects which may be helpful in the better implementation of the proposed project.

- GEF 1348, Regional, Africa Stockpiles Program P1 (World Bank);
- GEF 2720, Regional Project to Develop Appropriate Strategies for Identifying Sites Contaminated by Chemicals listed in Annexes A, B and/or C of the Stockholm Convention (UNIDO)
- GEF 3674, Supporting the Implementation of the Global Monitoring Plan of POPs in West Africa (UNEP)

*6. Consistency with National Priorities.* Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? (yes ☒ /no ☐ ). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.

The project is consistent with the priorities listed in the Nigeria National Implementation Plan of the Stockholm convention, which are:

- Reviewing pollution control related policies and regulations for effective implementation of the Stockholm Convention and other related conventions and international processes on chemicals management;
- Increasing institutional capacity of government departments/agencies and other institutions involved in implementation of the Rotterdam, Stockholm and other related Conventions and international processes on chemicals and wastes management;
- Strengthening enforcement of relevant legislation;
- Developing programmes and regulations on monitoring of POPs and relevant PIC chemicals;
- Strengthening the capacity of institutions responsible for POPs management
- Developing mechanisms to promote proper management of stockpiles of POPs.

The project is also completely compliant with the following key Nigerian regulations concerning environmental protection and chemical management, and indeed one of the purposes of this project is to further strengthen these regulations by properly integrating the provisions of the Stockholm Convention on POPs:

- The National Policy on Chemicals Management, developed and adopted by the the Federal Government in July 2010. With this policy document, the Federal Government is committed to the achievement of the goal of sound management of chemicals adopted by world governments in line with the Johannesburg Plan of Implementation of the 2002 World Summit on Sustainable Development. The goal of the National Policy on Chemicals Management is to integrate the management of chemicals for the protection of human and animal health and the environment.
- The 1989 National Policy on the Environment as revised in 1998, as well as a set of laws, regulations and guidelines to ensure the conservation of natural resources and the protection of the environment and human health.

*7. Knowledge Management.* Outline the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.



Under the project, a web portal for sharing relevant project information will be built. Users will be granted with access to data and document under the portal based on their profile of access. Public access will be granted to all the documents which are of public relevance, such as project performance, guidances documents, environmental impact assessment documents. User-friendly summaries and multi-media materials of the project activities will be uploaded in the portal periodically, and distributed as printed materials to facilitate the access of people who do not have easy access to the web.

Furthermore, under the project workshops and conferences will be held with the purpose to introduce previous experiences on POPs and PCBs management from other countries.

In addition to the above, the project will also establish an integrated Geographic Information System (GIS) which will be used for mapping the electrical equipment contaminated by PCBs or containing PCB oil.

### **PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)**


#### **A. RECORD OF ENDORSEMENT<sup>9</sup> OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):**

(Please attach the [Operational Focal Point endorsement letter\(s\)](#) with this template. For SGP, use this [SGP OFP endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Mr. Johnson Yomi LADAPO	Director, GEF Operational Focal Point	FEDERAL MINISTRY OF ENVIRONMENT	07/28/2015

#### **B. GEF AGENCY(IES) CERTIFICATION**

**This request has been prepared in accordance with GEF policies<sup>10</sup> and procedures and meets the GEF criteria for project identification and preparation under GEF-6.**

Agency Coordinator, Agency name	Signature	Date (MM/dd/yyyy)	Project Contact Person	Telephone	Email
Ms. Adriana Dinu Executive Coordinator UNDP - Global Environment Facility		07/30/2015	Mr. Jacques Van Engel	+1 (212) 906-5782	jacques.van.engel@undp.org

#### **C. ADDITIONAL GEF PROJECT AGENCY CERTIFICATION (APPLICABLE ONLY TO NEWLY ACCREDITED GEF PROJECT AGENCIES)**

<sup>9</sup> For regional and/or global projects in which participating countries are identified, OFP endorsement letters from these countries are required even though there may not be a STAR allocation associated with the project.

<sup>10</sup> GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, and SCCF

For newly accredited GEF Project Agencies, please download and fill up the required [\*\*GEF Project Agency Certification of Ceiling Information Template\*\*](#) to be attached as an annex to the PIF