



# GEF-6 REQUEST FOR PROJECT ENDORSEMENT/APPROVAL

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

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## PART I: PROJECT INFORMATION

|   |   |   |            |
|---|---|---|------------|
| Project Title: Strengthening the environmentally-sound management and final disposal of PCBs, in Paraguay |   |   |            |
| Country(ies):   | The Republic of Paraguay  | GEF Project ID: <sup>1</sup>                    | 9357       |
| GEF Agency(ies):  | UNIDO (select) (select)   | GEF Agency Project ID:                          | 150368     |
| Other Executing Partner(s):   | Ministry of Environment of Paraguay (SEAM), UNITAR  | Submission Date:                                | 12/07/2017 |
|   |   | Re-submission Date:                             | 01/30/2018 |
| 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 (\$)                                 | 375,559    |

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

| Focal Area Objectives/Programs         | Focal Area Outcomes  | Trust Fund | (in \$)               |               |
|--|--|------------|-----------------------|---------------|
|  |  |            | GEF Project Financing | Co-financing  |
| (select)<br>CW-2 Program 3<br>(select) | Outcome 3.1: Quantifiable and verifiable tonnes of POPs eliminated or reduced<br><i>Indicator 3.1: Amount and type of POPs eliminated or reduced</i> | GEFTF      | 3,953,250             | 24,319,721.56 |
| (select) (select)<br>(select)          |  | (select)   |                       |               |
| (select) (select)<br>(select)          |  | (select)   |                       |               |
| (select) (select)<br>(select)          |  | (select)   |                       |               |
| (select) (select)<br>(select)          |  | (select)   |                       |               |
| (select) (select)<br>(select)          |  | (select)   |                       |               |
| (select) (select)<br>(select)          |  | (select)   |                       |               |
| (select) (select)<br>(select)          |  | (select)   |                       |               |
| <b>Total project costs</b>             |  |            | 3,953,250             | 24,319,721.56 |

### B. PROJECT DESCRIPTION SUMMARY

| <b>Project Objective: To protect human health and the environment through environmentally sound management and final disposal of PCB-containing equipment and wastes, in Paraguay</b> |                             |   |   |            |                       |                        |
|---|-----------------------------|---|---|------------|-----------------------|------------------------|
| Project Components/ Programs  | Financing Type <sup>3</sup> | Project Outcomes  | Project Outputs   | Trust Fund | (in \$)               |                        |
|   |                             |   |   |            | GEF Project Financing | Confirmed Co-financing |
| 1. Environmentally sound management and final disposal of   | TA                          | Outcome 1.1. National PCB policy improved, capacity built and | 1.1.1 National PCB regulations are in line with international | GEFTF      | 857,000               | 5,000,000              |

<sup>1</sup> Project ID number remains the same as the assigned PIF number.

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

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

|   |     |   |   |       |           |               |
|---|-----|---|---|-------|-----------|---------------|
| PCB-containing equipment, wastes and stockpiles |     | knowledge and awareness increased   | standards<br><br>1.1.2 National PCB management Center established to support PCBs owners to properly manage and dispose of PCBs and related wastes<br><br>1.1.3. National data system set and analytical services strengthened to fully support the inventory development and management of PCBs and related wastes, in line with international standards and best practices<br><br>1.1.4 Hazmat and risk management trainings conducted and awareness raised to reduced exposure of workers and the general public to PCB and related toxic wastes |       |           |               |
|   |     | Outcome 1.2. National PCB management plans ready for smooth ESM and disposal of PCB-containing equipment and wastes | 1.2.1 Inventory of at least 10,000 PCB-containing equipment units and PCB wastes carried out, including sampling in oil and soils and with sound analytical methodologies<br><br>1.2.2. ESM and disposal plan for PCBs developed, including cost-effective disposal options<br><br>1.2.3 Assessment of PCB/u-POPs pollution due to fire on ANDE PCB-storage facilities  |       |           |               |
|   | Inv | Outcome 1.3. ESM and disposal of PCB-   | 1.3.1 Current PCB   | GEFTF | 2,768,000 | 17,569,721.56 |

|  |          |                                      |   |          |           |               |
|--|----------|--------------------------------------|---|----------|-----------|---------------|
|  |          | containing equipment and wastes      | interim storage facilities upgraded and operational<br><br>1.3.2 At least 700 metric tonnes of PCB-containing equipment and waste disposed of and/ or decontaminated  |          |           |               |
| 2. Project Monitoring and Evaluation       | TA       | 2.1 Monitoring<br><br>2.2 Evaluation | 2.1.1 Monitoring system is set and operational<br><br>2.1.2 Progress reports are delivered and required decisions/actions are taken<br><br>2.2.1 Mid-term review and final independent evaluation are conducted<br><br>2.2.2 Lessons learned are shared with all relevant stakeholders for future project improvement | GEFTF    | 140,000   | 750,000       |
|  | (select) |                                      |   | (select) |           |               |
|  | (select) |                                      |   | (select) |           |               |
|  | (select) |                                      |   | (select) |           |               |
|  | (select) |                                      |   | (select) |           |               |
|  | (select) |                                      |   | (select) |           |               |
| Subtotal                                   |          |                                      |   |          | 3,765,000 | 23,319,721.56 |
| Project Management Cost (PMC) <sup>4</sup> |          |                                      |   | GEFTF    | 188,250   | 1,000,000     |
| <b>Total project costs</b>                 |          |                                      |   |          | 3,953,250 | 24,319,721.56 |

### C. CONFIRMED SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE

Please include evidence for co-financing for the project with this form.

| Sources of Co-financing | Name of Co-financier       | Type of Cofinancing | Amount (\$) |
|-------------------------|----------------------------|---------------------|-------------|
| Recipient Government    | SEAM                       | In-kind             | 507,000     |
| Beneficiaries           | ANDE (Electrical facility) | Equity              | 17,548,214  |
| Others                  | UNITAR                     | In-kind             | 40,000      |
| GEF Agency              | UNIDO                      | Grants              | 83,000      |
| GEF Agency              | UNIDO                      | In-kind             | 167,000     |

<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.

|                           |                        |          |               |
|---------------------------|------------------------|----------|---------------|
| Private Sector            | Analitica SA           | In-kind  | 628,100       |
| Private Sector            | Laboratorios Diaz-Gill | In-kind  | 3,580,375.65  |
| Private Sector            | ITAIPU                 | In-kind  | 666,473       |
| Private Sector            | Grupo Multilab         | In-kind  | 1,099,558.91  |
|                           |                        |          |               |
| (select)                  |                        | (select) |               |
| (select)                  |                        | (select) |               |
| (select)                  |                        | (select) |               |
| <b>Total Co-financing</b> |                        |          | 24,319,721.56 |

**D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES), FOCAL AREA AND THE PROGRAMMING OF FUNDS**

| GEF Agency                   | Trust Fund | Country Name/Global      | Focal Area           | Programming of Funds   | (in \$)                   |   |               |
|------------------------------|------------|--------------------------|----------------------|------------------------|---------------------------|---|---------------|
|                              |            |                          |                      |                        | GEF Project Financing (a) | Agency Fee <sup>a)</sup> (b) <sup>2</sup> | Total (c)=a+b |
| UNIDO                        | GEF TF     | The Republic of Paraguay | Chemicals and Wastes | POPS                   | 3,953,250                 | 375,559                                   | 4,328,809     |
| (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             |
| (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 Grant Resources</b> |            |                          |                      |                        | 3,953,250                 | 375,559                                   | 4,328,809     |

a ) Refer to the Fee Policy for GEF Partner Agencies

## E. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS<sup>5</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 tonnes of CO <sub>2e</sub> mitigated (include both direct and indirect)                                    | <i>metric tonnes</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 tonnes of POPs (PCB, obsolete pesticides)   | <i>700 metric tonnes of PCBs</i>       |
|   | Reduction of 1000 tonnes of Mercury  | <i>metric tonnes</i>                   |
|   | Phase-out of 303.44 tonnes of ODP (HCFC)   | <i>ODP tonnes</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>             |

## F. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT? No

(If non-grant instruments are used, provide an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/CBIT Trust Fund) in Annex D.

<sup>5</sup> Update the applicable indicators provided at PIF stage. 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.

## **PART II: PROJECT JUSTIFICATION**

### **A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN WITH THE ORIGINAL PIF<sup>6</sup>**

1. The information presented in this CEO endorsement document builds on the situation described in the Project Identification Form (PIF). During the Project Preparation Grant (PPG) phase the project framework and implementation arrangements have been discussed with the government and relevant stakeholders to be involved in project implementation. The components and outcomes of the PIF have been kept, however, clarifications to the ESM disposal strategy have been discussed and agreed upon as below.
2. PPG findings: During the PPG phase two international and two national consultants were recruited to verify the baseline situation, especially related to the fire at the Administración Nacional de Electricidad (ANDE), the main stakeholder of this project, PCB storage facility in October 2015, and to propose potential environmentally sound management approaches. In addition, UNIDO entered into contractual arrangements with the United Nations Institute for Training and Research (UNITAR) to collect baseline information and to support drafting of this CEO endorsement document.
3. This consultancy team together with UNIDO's project manager travelled to Asunción, Paraguay, in late November/ December 2016 for project planning and baseline finding purposes.
4. During the course of the PPG efforts were made to strengthen the PCB inventory and find ways towards an environmentally sound management system, including final disposal of PCB-containing oil and PCB-containing equipment. After consultations and agreements made between the Ministry of Environment (SEAM) and ANDE, the following observations were proposed by SEAM to UNIDO:
  - a) PCB equipment and inventory: A PCB analyzer and testing reagents were purchased early during the PPG phase; however, customs procedures could not be finalized on time. Thus, the planned PCB analysis of equipment stored at ANDE's Laurely (San Lorenzo) storage place could not be carried out. Now ANDE's existing PCB laboratory results for this site will be used for this project, but the sampling and analyses with the purchased equipment will be conducted during project implementation under Output 1.2.1.
  - b) To achieve synergies and to avoid overlapping of activities between this proposed UNIDO-GEF project and ongoing initiatives developed by ANDE, the following agreements were set:
    - b1) All PCB equipment and PCB-containing wastes stored in ANDE's special closed warehouse N° 1 in Laurely, San Lorenzo, which total approximately 100 tonnes, will be eliminated solely through an international decentralized tender under the IDB Loan 2891/OC-PR;
    - b2) All distribution transformers stored in ANDE's open depot in Laurely, San Lorenzo, including those affected by the fire in 2015, will be characterized and subject to PCB chromatographic analyses. After that process, and depending on the PCB concentrations in oil, the management and final disposal of the PCB-containing oil and PCB-containing equipment will be carried out in the following way:
      - Transformers not affected by the fire, with PCB concentrations in oil over 2000 ppm will be stored / conditioned / exported and treated / eliminated overseas through an international decentralized tender. The technology or combination of technologies to be used (dechlorination, thermal treatment and incineration) will depend on the lowest cost that ensures ESM of PCBs and PCB-wastes.
      - Transformers not affected by the fire and contaminated with PCB concentration levels in oil between 500 ppm and 2000 ppm will be subject to further technical-financial analyses before a decision is made on whether they should be treated in-situ until the PCB-concentration in oil is

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<sup>6</sup> For questions A.1 –A.7 in Part II, if there are no changes since PIF , no need to respond, please enter “NA” after the respective question.

less than 50 ppm (and then proceed as below) or whether they should be set aside, conditioned and safely stored for final disposal through this UNIDO-GEF project.

- Transformers not affected by the fire, with PCB concentrations in oil between 50-500 ppm will be treated by dechlorination in-situ, in Paraguay (until PCB concentration in oil is less than 50 ppm); then, these transformers can be either retrofilled with non-PCB oils and reused, or further treated to get PCB concentrations in oil less than 2 ppm, to proceed as below.
- Transformers not affected by the fire with PCB concentrations in oil less than 2 ppm will not be treated and will be ready for ANDE's commercialization (in accordance with Paraguayan regulations);
- Transformers affected by the fire, with PCB in oil concentrations above 50 ppm will be considered contaminated equipment. They will be stored / conditioned / exported and treated / eliminated overseas by this GEF project through an international decentralized tender. The technology or combination of technologies to be used (dechlorination, thermal treatment and incineration) will depend on the lowest cost that ensures ESM of PCBs and PCB-wastes.
- Therefore, the total amount of PCB-containing oil and PCB-containing equipment to be managed under this UNIDO-GEF project will continue to be at least 700 tonnes of PCBs, out of which at least 300 tonnes of PCBs are due to the fire and the rest will be identified through this project in other ANDE facilities in Paraguay.

c) Project consultants have identified that ANDE has a total of 27 storage locations around the country, which will be included in this project, and visited a few of them in July 2017. From these locations, only one site named Boggiani is used to develop maintenance and repair activities of distribution transformers. In general, when a transformer arrives at a storage place, it is left outdoors on the exposed ground, without a previous classification. No tests are performed to detect presence of PCBs, and transformers wait in such way until personnel from Boggiani come to the site and decide which of them should be taken to the repair shop. In past years, transformers that were not going to be repaired were sent to the Laurety, San Lorenzo site but after the 2015 fire, those transformers remain in a storage site and for this reason, the storage places have being increased. Boggiani and the two other largest deposits (after Laurety), were visited by an international consultant in July 2017 to assess the management process currently in place in Paraguay.

d) Boggiani has been now included in the project due to its specific role and situation. Due to its infrastructure and management, it exposes ANDE and its surroundings to serious risks since no tests are performed to detect the presence of PCBs, and no segregated management of the hazardous waste generated in the process is in place. Even worse, no infrastructure or control elements to manage potential spills of dielectric oil are available and the access for firefighters to the area of the tanks containing oil is difficult.

e) Likewise, all other deposits, particularly the second largest one located in Ciudad del Este, have been included in the project because the Laurety site is almost full. In addition, when equipment is discarded, it remains in those deposits spread among different locations, adding complexity to an already difficult and complex situation.

5. During August 2017, consultation activities and a national stakeholder workshop have been organized in Asunción, Paraguay, to discuss, polish and endorse this CEO endorsement document, including the confirmation of co-financing commitments.

A.1. *Project Description*. Elaborate on: 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>7</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, CBIT and [co-financing](#); 5) [global environmental benefits](#) (GEFTF) and/or [adaptation benefits](#) (LDCF/SCCF); and 6) innovativeness, sustainability and potential for scaling up.

#### 1) Global environmental and/or adaptation problems, root causes and barriers that need to be addressed

##### a) **Global environmental problems**

6. The management of persistent organic pollutants (POPs) listed under the Stockholm Convention (SC) remains a global challenge. While success of the global efforts to rid the world of POPs has been demonstrated, developing countries still need additional resources to address existing and emerging chemicals-issues including the 'old' and 'new' POPs listed under the Convention.
7. Due to their broad use, their often inappropriate disposal practices and their long persistence in the environment, polychlorinated biphenyls (PCBs) are now ubiquitous environmental contaminants, which bio-accumulate due to their lipophilicity. PCBs tend to concentrate in sediments, especially in the marine environment, as the water layer above protects them against the ultra-violet part of solar radiation that would otherwise photodegrade them. The impacts of PCBs on human health and the environment are very well documented. Evidence of PCB toxicity was found in animals used for experimental purposes: the toxic effects include skin disorders, weight loss, endocrine and reproductive disorders, carcinogenesis (liver carcinoma), etc. Based on a March 2013 review of scientific evidences, IARC (International Agency on the Research on Cancer) has classified PCBs as class 1 carcinogenic compound. Thus, according to Annex A Part II of the Stockholm Convention, Parties to the Convention are obliged to eliminate equipment and oils containing PCBs from use by 2025 and bring these under environmentally sound waste management by 2028. As a Party to the SC on POPs, Paraguay is obliged to comply with the targets designed to reduce or eliminate releases from intentional and unintentional production of POPs.
8. Environmentally sound management of PCBs is also relevant to the 2030 SDGs, especially to SDG 1 (“End poverty in all its forms everywhere”) because PCB management within the electricity sector involves lots of disassembling, repairation and even recycling activities of the (cleaned) scrap metals of transformers providing many job opportunities to the general public. Additionally, proper PCB management which relates environmental and health aspects as well as socio-economic benefits is relevant for the following SDGs:
  - **SDG 3 (Ensure healthy lives and promote well-being for all at all ages)**, target 3.9 (By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.)
  - **SDG 5 (Achieve gender equality and empower all women and girls)**, target 5.5 (Ensure women’s full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life)
  - **SDG 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation)**, targets 9.2 (Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry’s share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries); and 9.4 (By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities).
  - **SDG 11 (Make cities and human settlements inclusive, safe, resilient and sustainable)**, target 11.6 (By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management), and

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<sup>7</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..



9. Global environmental problems such as long-range problems related to unsound use and disposal of hazardous PCB-oil or PCB-containing equipment are also associated with lack of inclusive and sustainable life-cycle management approaches. As such UNIDO's approach to Inclusive and Sustainable Industrial Development (ISID) and especially its mandate of promoting competitive and environmentally sustainable industries within a Circular Economy approach is beneficial for this PCB project.
- b) Besides the improper use and disposal of PCB-oil and PCB-containing equipment, recycling of PCB-contaminated scrap metals from transformers nationally or regionally is also a problem in Paraguay because of increased cross-contamination. However, if transformer equipments are properly cleaned, economic benefits from scrap metal recycling are visible and in line with a Circular Economy Approach. **Root causes**
10. The elimination of PCB-containing oil, equipment and waste become a top priority given by the President of Paraguay, through the Minister of the Secretariat of Environment (SEAM) and the President of the National Administration of Electric Energy (ANDE) of Paraguay after a fire on 14 October, 2015 happened in the deposit of ANDE's storage place named Laurely (in the municipality of San Lorenzo, Paraguay).
11. This facility is crucial for the electricity supply in the country and is located in a densely populated metropolitan area 11 kilometers from the capital city of Asunción. In the ANDE-owned warehouse, 20,000 out-of-service transformers, debris decks, burned low-energy bulbs, fluorescents, oils and debris from electrical and electronic devices were stored outdoors on open ground (27 hectares).
12. On the same site there is also a deposit where ANDE stored transformers and debris of a 2004 explosion of reactors containing PCBs of the Acaray hydroelectric plant.
13. The fire affected stored transformers, and other equipment containing PCBs; as a consequence dioxins and furans were released into the environment and oil spills from the transformers occurred. The fire was extinguished after about 4 hours, using foam and water to cool the adjacent areas.
14. Due to the fire at Laurely in 2015 (Annex I), it was estimated that the fire affected approximately 9,000 transformers. Some smoking spots were controlled and extinguished until the morning of October 15, 2015.
15. Since the fire occurred, no additional activities took place, despite many site visit missions and provision of reports. Also the ashes were not covered, and therefore spread uncontrollably by wind and the often heavy rainfalls. The outdoor storages of phased-out transformers on the San Lorenzo site can basically be divided in four categories:
  - a. PCB free, not involved in 2015 fire
  - b. PCB suspected, not involved in 2015 fire
  - c. PCB free, affected by 2015 fire
  - d. PCB suspected, affected by 2015 fire
16. Although the lead parameter for this GEF-project are the PCBs, it is important to mention that other contaminants such as PCDD/PCDF, but also Pb, Zn, Cr, Cr VI, Cd and even Hg (from paints on transformer casings) plus hydrocarbons (from mineral oil filled units) could have been formed and released during the fire. Thus, the site characterization and site assessment is of importance but will be funded by ANDE not through this GEF-project project.
17. Due to the above circumstances, i.e. the huge number of phased-out transformers and of course the expected severe contamination caused by the 2015 fire, the PCB problem on the San Lorenzo site must be addressed with utmost priority during the beginning of the project implementation phase.

18. In addition to emergency causes, the environmentally unsound management of PCBs in Paraguay is also triggered by the lack of appropriate PCB policies, regulations and environmental management plans, lack of national capacity (e.g. inventory, data and risk management) as well as lack of awareness and training.
19. For example, the majority of stakeholders in Paraguay have limited understanding of risks posed by PCBs. Despite the efforts and awareness raising activities conducted during the development of the National Implementation Plan (NIP), owners of PCB oils and PCB contaminated equipment and wastes are unaware of the potential threats that PCBs can pose to the environmental and human health. Thus, PCB-contaminated equipment is handled inappropriately (e.g. without protective equipment) due to lack of knowledge.
20. All this is reflected in the management carried out by both public and private companies, where cross-contamination and lack of control in the sale of used equipment and oils are the prevailing trends.

**c) Barriers**

21. Paraguay has a weak institutional capacity and regulatory framework for the environmentally sound life-cycle management of PCBs, which results in poor compliance of PCB-related obligations under the Stockholm Convention on POPs.
22. Paraguay has already made efforts to upgrade its existing PCB-related regulatory framework and in providing limited assistance to PCB owners to comply with the PCB obligation that Paraguay has as a Party to the Stockholm Convention. For example, Paraguay has drafted a bill to establish the environmentally sound management of PCBs and electrical equipment for environmental protection. However, because of the weak institutional and regulatory framework and the implementation and enforcement of the legislation these tasks remain challenging.
23. Lack of awareness of national stakeholders (community members, electrical sector companies, decision makers, informal sector) results in poor PCB management practices leading to negative impacts on the environmental and human health. The re-use of highly PCB-contaminated transformers, improper PCB maintenance and selling of transformers out of the country might result in cross-contamination and an increased PCB contamination in the environment.
24. Government officials and electrical utility companies have limited technical capacities to identify and manage PCBs. There are four private laboratories which have developed the necessary capacities and, at least one of them has the corresponding certification for PCB analysis in oil; however, there is still uncertainty regarding the use of these capacities, particularly by ANDE. A preliminary inventory was done with a Dexsil L2000 equipment and reactivities; however, confirmatory gas chromatography testing was not done due to lack of national resources and previous lack of analytical capacity. Thus, lack of knowledge whether a transformer and its oil is PCB-contaminated might result in cross-contamination.
25. Even when companies are aware of the risks associated with PCBs, lack of financial resources and incentives might lead them to delay the inventory activities and other required actions in compliance with the SC and inline with environmentally sound management of PCB-contaminated equipment.
26. The project is in line with the GEF-6 Chemicals and Waste Strategy, whose long term goal is to prevent the exposure of humans and the environment to harmful chemicals and waste of global importance, including POPs, mercury and ozone depleting substances, through a significant reduction in the production, use, consumption and emissions/releases of those chemicals and wastes.

## 2) Baseline scenario or any associated baseline projects

### 2.1. Background information

#### 2.1.1 Geography

27. The Paraguayan territory is located around 800 km from the Pacific Ocean and at 600 km from the Atlantic Ocean. It limits to the north with Brazil and Bolivia, to the east with Brazil and Argentina, to the South with Argentina and to the west with Argentina and Bolivia. The country is divided politically in 17 departments: 14 in the Eastern Region and 3 in the Western one which are Presidente Hayes, Alto Paraguay and Boquerón. Asunción, Capital of the country and the departments of Concepción, San Pedro, Cordillera, Guairá, Caaguazú, Caazapá, Itapúa, Misiones, Paraguari, Alto Paraná, Central, Ñeembucú, Amambay and Canindeyú are located in the Eastern Region. The department with the biggest surface is Boquerón, with an extension of 168.030 km<sup>2</sup>, meanwhile the smaller is Central, with 2.652 km<sup>2</sup>.

28. Paraguay has a scattered distribution of population, with a density of little more than 13 inhabitants per km<sup>2</sup>. The population distribution between the Eastern and the Western Regions or Chaco is unequal; thus in the first (with 159.827 km<sup>2</sup>) 31,5 inhabitants live for each km<sup>2</sup>, and in the second (with 246.925 km<sup>2</sup>) approximately one person per km<sup>2</sup>. The total population amounts to 6.009.143 inhabitants, noticing an almost equal distribution between males and females. Nevertheless, by area of living of the population it is observed a slight predominance of the urban one. The age structure reveals that it is a predominantly young country, where 62,6% of the population have less than 30 years old and the group of 65 year old and more represents 6% of the total population. The sector of the Paraguayan economy with the most important role is the one of services, that includes commerce, gastronomy, hotel industry, finance and insurances, social and real estate services and basic services (energy, water, transportation and communication) with a total of 52 % of the Gross Domestic Product.

#### 2.1.2 Industry Sector

29. Among the most important economic activities of the country, considering the goods production, the agriculture and livestock are the most outstanding sectors. In relation to the agricultural sector, in spite of the low productivity in the last years, cotton maintains its tradition in the country, since is the main profit cultivation for the small producers. The main national industrial farming is the sugarcane, raw material used for the production of sugar and alcohol that is cultivated principally in Guairá, Paraguari, Cordillera and Caaguazú.

30. A study prepared by the Ministry of Industry and Commerce reveals that, even though the participation of the industrial sector is not the most important yet in the national economy, its importance grows in a continuous way. According to the available data, it was maintained relatively stable in relation to its participation in the Gross Domestic Product (GDP) of the country in the last ten years, representing approximately 14,5% of the GDP in the year 2005.

#### 2.1.3 Energy Sector

31. The National Electricity Administration Entity (ANDE), is responsible for the generation, transmission and distribution of the electric energy throughout the national territory. It has more than 3,500 public employees and serves more than 1,200,000 clients, reaching a coverage of 98,5%. The national demand is covered by the electricity acquired from three Hydroelectric Central Plants: Central Acaray (Property of ANDE), Yacyretá (Property of Paraguay and Argentina) and mainly from Itaipú (Property of Paraguay and Brazil). In terms of distribution, medium voltage networks total more than 32,500 km and low voltage networks around 29,500 km throughout the country. The total number of transformers in the network is estimated at about 66,000 units. To date, no PCB inspections have been carried out on the equipment that is operational in the network, nor are PCB inspections carried out in the maintenance workshops. ANDE owns around 90% of the countries transformers and thus will be the main electricity stakeholder for this project.

32. The country has a production of 53,000 GWh/year, from which it consumes approximately 7,000 GWh/year; being the only country of the region that has exceeding of hydroelectric energy. Contradictorily, the consumption of hydroelectric energy represents only 10% of the national energy consumption. The biomass (wood, coal, fruits and grains peels, sugar cane remaining) represents the most important segment of energy consumption (59%), followed by petroleum (30%) and the bio fuels with 1%.

#### 2.1.4. PCB Situation

33. The SC on POPs is an international instrument, legally binding, directed to the reduction and further disposal of such substances by the signatory countries, with the objective of protecting the environment and the human health against the POPs such as PCBs. This Convention was signed by Paraguay in May 2001, ratified by Law 2333 on January 6th, 2004 and get into force on May 17th same year. With the purpose of fulfill with the SC SEAM has coordinated the formulation of the “National Implementation Plan for the Stockholm Convention about Persistent Organic Pollutants”, with the United Nations Environmental Program (UNEP) and the financial support of the Global Environment Funds (GEF).

34. The Paraguayan National Implementation Plan (NIP) highlighted the serious weaknesses of the current hazardous waste management practices and recommended institutional and regulatory development, capacity building, and public awareness in the area of PPOPs. In particular, the NIP contains the following national priorities: (i) strengthening national capacity for POPs management (ii) development of a comprehensive PCB national inventory and elimination of known stocks (iii) establishment of an adequate environmentally sound management system for obsolete POP pesticides and (iv) development and maintenance of an effective public awareness programmes for the Paraguayan population.

35. The NIP notes that PCB-containing equipment is still being used in Paraguay, and its main owner is ANDE. According to the preliminary inventory undertaken in the course of the NIP Enabling Activities project, the in-service and surplus PCB equipment in the country represents a significant threat to the environment because PCBs are neither properly identified nor properly managed. The number of estimated power and distribution transformers in the electrical power sector in Paraguay is about 120,000 according with the data provided by NIP in August 2017 (93,000 in service, and 18,000 out of service and 9,000 burned) and, as result of ANDE's policy of purchasing new equipment instead of repairing it, this number is currently increasing. It is also estimated the presence of about 360 transformers for transmission. During the NIP, 438 PCB-containing pieces of equipment in use were inventoried, from which 95.2% corresponds to electrical capacitors; 3.4% corresponds to transformers and reactors; and 1.4% to distribution transformers. Out of these 438 pieces of equipment, 421 were identified (not tested) as containing PCB and 17 as suspected. The transformers inventoried and identified as suspected were under repair and/or maintenance in Asuncion and San Lorenzo (Laurelty). The Laurelty site underwent a fire episode in October 2015 which resulted in destruction of about 9,000 obsolete distribution transformers which represents additional 300 tonnes of waste equipment contaminated with PCBs.

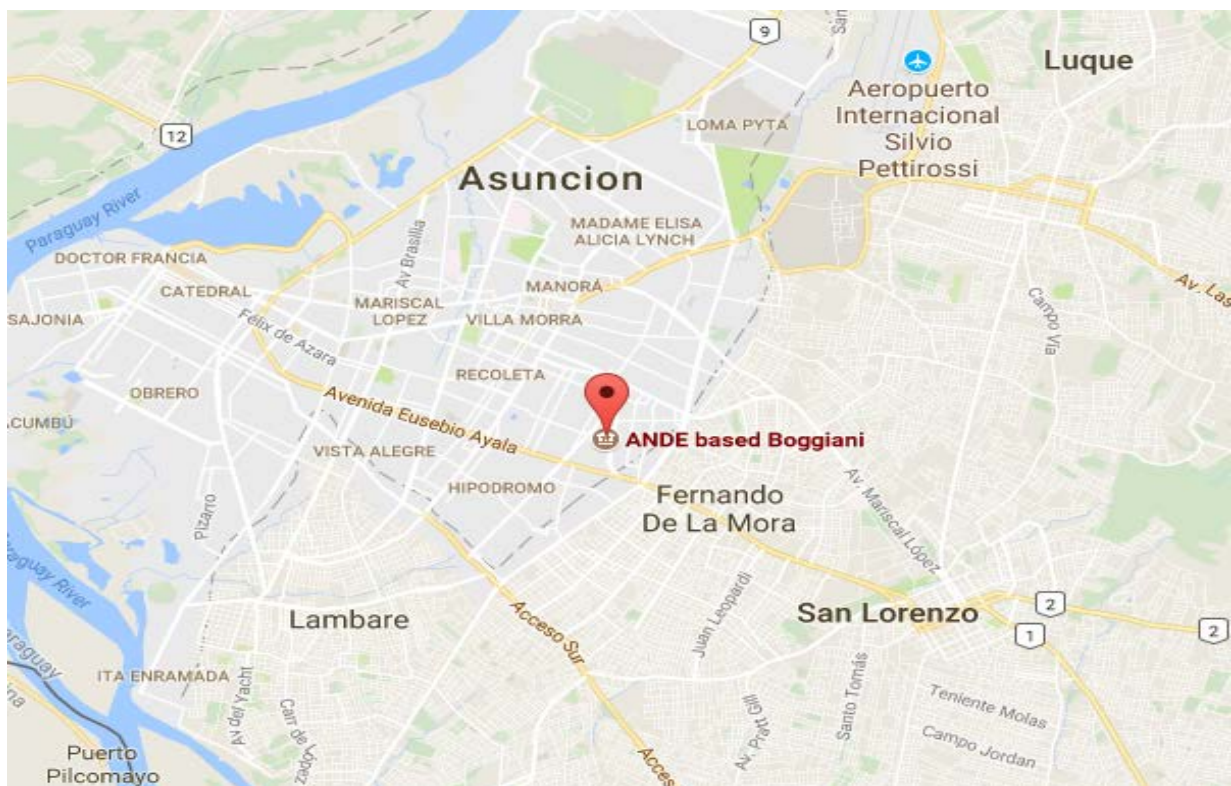
36. Thus, The NIP identified that a detailed, systematic and reliable PCB inventory has yet to be compiled in Paraguay. A comprehensive inventory of the different PCB applications will be the key tool for all future activities and strategies. It will be the basis for priority setting, appropriate allocation of resources and the selection of transport, interim storage and disposal methods for the identified PCBs.

37. As part of the original NIP, an inventory of PCBs in the country was undertaken. This inventory focused in closed systems applications (electric transformers and capacitors), and counted on an important participation of the energy sector, mainly on ANDE and the Bi-national Entity Itaipú. The industrial sector had a lower participation, even though at the end stage of the NIP a higher participation took place. The inventoried amounts correspond to preliminary figures, where the amount of oil with suspicious content of PCB reaches 115,000 liters and the contaminated material added to phased-out equipments amounted to 48 tonnes. Nevertheless, the evaluation that accompanied the preparation process of the inventory raises certain worries in reference to the previous and current management of this pollutant and actions on this respect have started to minimize the risks associate to it.

38. Potential Contaminated Sites with high presence of POPs were identified in Paraguay, namely: the IAN warehouse in Caacupé, the OFAT warehouse in Asunción, the Acaray Energy Plant in Hernandarias, the PCB interim warehouse of ANDE in San Lorenzo, the support station of Itaipú Binacional and the former PCB warehouse within the same facility, as well as the open air spillway and places where medical wastes are incinerated. Nonetheless, this project will focus only on contamination related to PCB and associated u-POPs.
39. There are specific national prioritisation criteria to be taken into account, such as the necessary immediate actions on the San Lorenzo site as well as the prevalence of hazardous behaviour such as the uncontrolled recycling or export of possibly PCB containing waste oil and scrap transformers (e.g. via the “green border” to Brazil).
40. Prevention at the source is an important point to be addressed in Paraguay. This is due to the fact that it is still likely that clean oils and soils are being contaminated by PCBs due to the lack of knowledge. Too often, there is no awareness of the dangers posed by PCBs, and there are no control systems in place to prevent cross-contamination. An environmentally sound handling of phased-out electrical equipment is often non-existent. A device which cannot be repaired and reused does not represent any commercial value, and therefore it is handled as scrap without any further precautions taken.
41. In addition, the process towards BAT and BEP in the handling of electrical equipment should certainly be improved. It may be possible that PCB-containing transformers were replaced in the past, and some of them may have been sent to unknown locations. In addition, PCB containing wastes may have been dumped or taken over the borders to foundries in neighbouring countries. This has to be tackled in depth during implementation.
42. Currently, phased-out transformers and capacitors are still commonly stored in the open air directly on the ground (no concrete or other kind of trip trays). Many of the devices are in bad condition and leaking, partly the carcasses are open and in case of rainfall the cooling fluid overflows and contaminates the soil. Large quantities of PCB transformers, capacitors and oils are still present on the San Lorenzo, Capiatá, Ciudad del Este and Boggiani sites. These wastes have been posing a sizeable risk for many years and, after the 2015 fire, they must be eliminated with priority. In addition, wastes of electric and electronic devices, mainly fluorescent lamps, were found on the sites, which add to the problem. In addition, drinking water is generally taken from the underground and pumps are located below contaminated areas; at least in one place, fruit trees grow among the equipment, and these fruits are consumed by the staff.
43. Many of the phased-out capacitors in the storage sites could contain PCB, but there is often no indication on the nametags whether or not they really contain PCB. These capacitors should be identified and triaged in order to handle them appropriately. Furthermore, they are hardly packed in an expert manner. PCB containing capacitors should always be stored upright and in UN approved packaging.
44. UN approved and clearly labelled packaging must be used for all types of PCB wastes. In Paraguay, original packaging of new mineral oil (e.g. Shell Diala D) have often been used for waste oils, which could lead to misunderstandings as to whether new (and PCB free) oil is in the drums or whether they contain used oils which might be contaminated by PCB.
45. In many storerooms there are PCB-containing solids and liquid wastes, transformer carcasses and capacitors as well as PCB-free wastes. Unfortunately, there is no clear categorisation or separation of the wastes nor a systematic wheaterproof marking (labelling). In case of an incident, it will therefore be very difficult to know where the hazardous materials are stored. Updated inventory lists giving information on the stored wastes are not standard practice, either. Furthermore, all storerooms and storage sites should be secured with priority, in order to avoid burglaries, unauthorised access and incidents.
46. Contaminated soil, construction parts, pumps, pipes and tanks, electrical scrap, etc., as well as open applications of PCBs have not been systematically included in the preliminary PCB inventory, and shall possibly be

considered in the detail inventory. A standardised database for the efficient recording of the collected data has yet to be developed. This database shall enable an easy updating and evaluation of the data.

47. The lead for the implementation and supervision of the labelling should be with SEAM because there was already a decision regarding these issues some years ago, but it was never implemented (see the guide for PCB Screening).
48. For ANDE's site in the Laurety District of the City of San Lorenzo (see image in paragraph 49) , an environmental circle has been granted by the Secretary of the Environment within the framework of Law 294/93 "Environmental Impact Assessment.", which will be conducted by ANDE. The approved Environmental Management Plan contemplates the activities that ANDE executes in said site as part of the Environmental Liabilities Mitigation Plan, including sampling and analysis of dielectrics, storage of electrical equipment, storage of equipment and waste contaminated with PCBs, as well as the processes of decontamination and disposal of PCB stocks. For regional deposits, the ANDE Plan contemplates the environmental licensing of the 27 deposits by the end of 2017.
49. With reference to the Boggiani site where the distribution equipment maintenance workshop operates, the terms of reference for the preparation of the Environmental Impact Study and the Environmental Management Plan have been elaborated, in which the sampling of oils, Soil and water for determination of PCB, as well as the design of works of adaptation of the system of conduction and treatment of effluents, and the security system of the area.
50. Location of Ande based Boggiani and San Lorenzo:



## 2.2. Baseline scenario

51. Paraguay lacks the regulatory framework, national technical capacity and awareness to properly address PCB-related problems, especially regarding the fire in October 2015. Although some efforts were made to address

national PCB-related problems, financial and technical assistance is needed to advance environmentally sound management of PCBs, the regulatory framework, technical best practices and awareness that could minimize the negative environmental and health effects of inadequate PCB management. Without GEF-funding and technical assistance through UNIDO it will be unlikely that a long-term environmentally sound management system, including a final disposal system for PCBs will be established in Paraguay.

52. Until now, Paraguay could not develop and implement effectively an environmental management system (EMS) for PCBs, nor could they adopt the necessary regulatory framework and develop its institutional capacity to monitor and control its PCBs. Due to its low technical capacity, a detailed PCB inventory could not be developed, nor analytical capacity be built, so no significant improvement in the existing storage conditions and environmentally sound management of PCBs could be achieved. Without this inventory, neither an appropriate ESM nor a technically and economically-feasible disposal strategy can't be set-up. GEF funding and UNIDO's technical support would support these activities.
53. Currently the management of out-of-service equipment is not an environmentally sound activity and there is lack of knowledge and information on technical standards and procedures for proper handling and storage of PCB contaminated equipment, oils and waste. Especially, the situation at ANDE's storage site in Laurety, is critical because of the lack of proper management of the transformers and due to the environmental problems which occurred after the fire in October 2015. This fire and the related exposure of PCBs posed additional risks to human and environmental health, and in addition imposed human resources, technical and knowledge challenges to the safe handling of PCB-containing equipment, oil and waste. Without financial and technical support an improved environmental situation will not be likely in the near future.
54. In addition, the site in Boggiani which is the only site (out of 27 national sites) for maintenance and repair activities for distribution transformers faces serious problems in terms of infrastructure and management because there no analytical test regarding the PCB existence, environmentally sound management precautionary measures (e.g. transformers are stored outdoors, safety measures for surface and groundwater is missing) and the overcapacity of the site.
55. There is a similar scenario in Capiata and Ciudad del Este because of the lack of management procedures (e.g. no transformer classification, PCB tests, lack of environmental and health measures) and increased capacity after the fire in San Lorenzo.
56. Under this scenario, PCBs will still be released into the environment and cross-contamination will continue, causing potential environmental and human health risks, especially to workers, communities living close to in-use and phase-out transformers, women and children. Occupational health, safety standards and awareness raising material will not be available to help protect workers and the population living nearby storage facilities from the exposure to PCBs.
57. To sum up, without GEF funding, Paraguay would have challenges to comply with the SC requirements related to PCB management and disposal by 2028, so the risks of exposure to PCBs that pollute the environment and threaten human health, will fuel high environmental and health concerns within the country, especially for workers dealing with PCB-oil, PCB-contaminated equipment and PCB waste, as well as environmental and health concerns for the general public and at the global level due to the POPs properties of PCBs.

### 2.3. Baseline projects

Baseline for outcome 1.1. National PCB policy improved, capacity built and knowledge and awareness increased

58. Legislative framework: Paraguay has a regulatory framework related to chemicals management based on Law 567/95 which endorses the Basel Convention and Law 2333/04 that ratifies the Stockholm Convention. Law

294/93 addresses the environmental impact assessment process and applies to all individuals, companies and activities using hazardous wastes. Regarding PCB management, SEAM has enacted two important regulations aimed to reduce the health and environmental impact of PCBs. The first is SEAM Resolution 1190/08 that sets measures for the safe management of PCBs in Paraguay. It addresses the risk of inadequate PCB management by regulating the equipment and oil life cycle, from the import of equipment, maintenance activities, management obligations (inventory, labelling, transport) to the disposal. The second, SEAM Resolution 1402/11, was formulated to establish protocols for the treatment of PCBs as part of the implementation of the Stockholm Convention in Paraguay. These resolutions address management of PCBs but their effectiveness is reduced due to the limited institutional and operational capacity of the regulating institutions, which require support to enhance their capacities to articulate an efficient and effective monitoring and control system. The areas of PCB management that need to be particularly improved in Paraguay relate to the analysis, maintenance and replacement of equipment, among others. Nonetheless, the PCB management regulatory and compliance control of these resolutions should be addressed as part of a national chemicals management strategy developed not only for PCBs but also for other hazardous chemicals.

59. The main challenge is how to piece together the initiatives and the existing infrastructures as a collective whole to create a harmonized scheme leading to an efficient and well-informed network for the management of PCBs. Paraguay has a regulatory framework governing environmental management, but the rules and regulations for the management of industrial chemicals are not fully enforced.
60. The SEAM has a data base for the management of chemicals and their waste production. It needs to be updated and include options for PCB management directly through the reporting of PCB inventory information and its updating activities. This is the only form in which the SEAM can monitor and control the existence of contaminated equipment, oils and waste and direct its actions towards the fulfillment of the Stockholm Convention goals for elimination by 2020 as indicated in their PCB regulation.
61. During the PPG process a three chemical analysis laboratories were interviewed and these have expressed their interest in participating in the development of national PCB analysis capacity. One of the laboratories has accreditation for PCB analysis in oil and at least one other is already initiating the necessary activities to accredit the PCB analysis. The analytical capacity exists but will require some support from the project to obtain PCB analysis parameters and receive training for their in house personnel in the areas of sampling and PCB analysis.
62. Up until the most recent fire (2015) in the ANDE installations in Laurety, which resulted in the burning of 9,000 (out of 20,000) transformers that could have contained PCB, the national awareness of the potential risks behind inadequate management of PCB contamination was very limited. This unfortunate incident brought awareness of dioxin and furan and PCB contamination to a national level. The national electrical companies, large and small, and large consumers who have their own equipment, need to receive technical assistance or training from experienced technical personnel.

Baseline for Outcome 1.2. National PCB management plans ready for a smooth ESM and disposal of PCB-containing equipment and wastes

63. After the original NIP, Paraguay implemented a small pilot to analyse more transformers using the Dexsil LX 2000 as the initial screening method. Out of the 644 transformers tested, 186 units contained PCBs above 50 mg/kg. This result seems to indicate that about 30% of all transformers are contaminated with PCBs with concentration above 50 mg/kg. According to the data provided by PNI in August 2017, there are about 120,000 transformers in Paraguay. The project will test 10,000 transformers which both PCB screening and analytical gaschromatography tests, which has not been completed so far.



64. To date ANDE has already analysed 6,000 damaged transformers (around 5.5 % of the total) and 147 transmission transformers . This work has been conducted with funding from the Inter American Development Bank (IDB) and its results can be used for this project. However, the PCB inventory is still incomplete.
65. As part of a strategy of awareness raising on environmental issues, different activities took place in Paraguay which consisted mainly of workshops and seminars addressed to different sectors of the population with the objective to inform about POPs, the Stockholm Contention, the elaboration of the NIP and its progress.

#### Baseline for Outcome 1.3. ESM and disposal of PCB-containing equipment and wastes

66. Unfortunately, there are not yet identified experiences of environmentally sound management (ESM) and disposal of PCB-containing equipment and wastes, which is to be addressed mainly through this project. Through the IDB-funds it has been decided that 100 tonnes of pure PCB-oil and equipment will be exported for final disposal and the preparatory work has already started in 2017. The findings from the PCB inventory and experiences made with the PCB export will be used for the final environmentally sound proposal strategy for the remaining 700 tonnes.
67. However, the project will built upon the funds obtained from the Inter-American Development Bank IDB 2891 / OC-PR for the Integral Environmental Mitigation Plan and final disposal. The project will start at the end of 2017 and will last until the year 2023. The total amount of the project is USD 6,191.661 (USD 5.000,000 with source IDB), with the following goals: construction of the PCB Laboratory building, construction of the new workshop for maintenance of distribution equipment, installation of fire protection systems in the San Lorenzo building, acquisition of equipment for analysis and treatment of Oils, and disposal of PCB stocks

#### 2.4 Remaining problems / barriers to be addressed by the project

68. One remaining problem is the necessity to create a regulation or norm which considers all the aspects of the life cycle of that pollutant; in this way, not only an adequate management would be achieved but also it might be count with more detailed and accurate information about the national situation regarding PCBs. The SEAM as the regulating authority for chemical management does not have the necessary resources to implement the existing regulatory framework for PCB management and disposal. The SEAM needs strengthened institutional capacity to be able to enforce the environmental sound management of PCBs.
69. ANDE is the largest electrical companies but there are other electrical companies and private large consumers that have transformers that could contain PCBs in Paraguay. The national inventory and environmentally sound management guidelines will need to be presented and validated with these stakeholders also. In addition, a long-term environmentally sound elimination strategy beyond this projects needs to be identified.
70. Another important aspect to be considered is the lack of information by the responsible stakeholders (government entities, suppliers, manufacturers, etc.), which results in a lack of general information for about the scope of the problem and consequently a non-existent planning of prevention and corrective actions. This point becomes of even greater importance when considering the daily risk of workers of possessing companies, as well as the nearby populations and the environment that surrounds them are exposed to.

#### 2.5 Relevant Data & PPG findings

71. ANDE has a total of 27 storages in the country and only one site, Boggiani, for maintenance and repair activities of national distribution transformers. Laurelty, which is the site where the fire took place 2 years ago, is the most important national storage site and apparently transmission transformers are being repaired there; however, this information must be verified. According to information provided by the NIP, there are in the order of 25 private companies which provide services of maintenance and repair. ANDE prefers to buy new equipment rather than repairing the distribution equipment. In that sense in the year 2013 ANDE made the to

maintain the repair of equipment in Boggiani but not to contract more services in private companies. Some relevant data follow:

- a) At the moment, between 80 and 100 distribution transformers are being repaired in Boggiani per month.
- b) All the latest purchases of distribution transformers have been done by ANDE at local companies.
- c) Approximately 7000 equipment are purchased per year.
- d) ANDE has established specifications for the purchase of new equipment when in the presence of less than 2 ppm, but does not control its compliance.
- e) ANDE has not established the requirement to label the equipment it purchases.
- f) Boggiani is likely to be relocated in San Lorenzo approximately in 2020.

72. The situation of Boggiani, both in terms of its infrastructure and its management, exposes ANDE to face serious risks, because:

- a) No tests are performed to detect presence of PCBs.
- b) No segregated management of the hazardous waste generated in the process is implemented.
- c) No infrastructure or elements to control or manage potential dielectric oil spills are in place.
- d) There is no easy access for firefighters to the area of the 3 tanks.
- e) Transformers that arrive to be repaired are left outdoors on the ground.
- f) The washing processes of the transformers are performed outdoors, while the generated effluents are derived without control to the drainage of rain.
- g) Drinkable water is taken from the groundwater and the pump is located below the contaminated area where transformers wait to be repair.

73. The situation of the Capiatá and Ciudad del Este sites can be summarily described as follows:

- a) Transformers that arrive are left outdoors on the ground without any previous classification.
- b) No tests are being performed to detect the presence of PCBs.
- c) Transformers remain in this place until personnel from Boggiani come to the site and decide which of them match the conditions to be repaired.
- d) ANDE never sells transformers in these locations.
- e) Since the fire in San Lorenzo ANDE does not send transformers to San Lorenzo as it did in the past. For this reason the storage inventory has increased.
- f) At the present iem they are working to put order in the open-pit storages
- g) Transformers of different manufacturing dates, as well as evidence of spills, fluorescent lamps and other wastes of electro-electronic devices were found on-site.
- h) Drinkable water is taken from the groundwater and the pump is located below the contaminated area.
- i) On the border of the properties there are houses and in the case of Ciudad del Este, there is a school with a soccer field right at the property's limit.
- j) No infrastructure or elements to control or manage potential spills of dielectric oil are put in place.
- k) No elements were identified for fire control.

74. As a summary of relevant findings:

- a) The amount of equipment to be disposed of increases and the storage capacity is more and more limited because ANDE prefers to buy new equipment rather than repairing existing ones. SEAM does not allow the sale of scrap because there are no chromatographic tests available.
- b) Cross-contamination continues and makes ANDE's economic efforts to buy equipment less than 2 ppm useless because no tests are performed to detect presence of PCBs and the equipment is not labeled.
- c) There is a current of uncontrolled dielectric oils that enters the market without knowing for certain its destiny because no tests are performed to detect presence of PCBs and there are no restrictions or regulations for the sale and use of waste oils.

3) the proposed alternative scenario, GEF focal area<sup>8</sup> strategies, with a brief description of expected outcomes and components of the project

75. The proposal directly relates to GEF-6 Chemical and Waste focal area CCM-2, Program 3: Reduction and elimination of POPs. Specific milestones of the Stockholm Convention will be targeted to meet the deadlines to complete replacement of PCBs contaminated oil and equipment with PCB-free units (2020), to complete the phasing out (2025), and for the destruction of PCB-containing oil and equipment (2028).
76. The Government of Paraguay, through SEAM (Secretaría del Ambiente), is in charge of the implementation of the SC on POPs and has ratified the Convention on 6 January 2004. The NIP, which identified PCBs as top priority, was officially submitted to the SC Secretariat in 2008. The proposed project is designed to meet Paraguay's obligations under the SC, as it tackles a priority action from its first NIP, the phase out of PCB-containing equipment by 2025.
77. The project seeks to address improper management of PCBs in closed applications. It aims to assist the government in developing and implementing environmentally sound management (ESM) systems for PCBs through strengthening of the related national legal framework, creating national capacities to manage these POPs, and conducting disposal/ treatment of POPs-containing equipment and wastes as well as awareness raising and trainings.
78. The circumstances require immediate action and a very pragmatic approach and course of action during the PCB inventory phase in order to use the resources and time available in a most efficient manner. Therefore, as much of the electrical equipment as possible shall be triaged by visual checks and based on the data available on the devices (for example year of manufacture).
79. The goal is to identify, triage, pack and ship as many devices as possible (e.g. 200 tonnes) in order to create the necessary space for all following activities required after the 2015 fire. The external parts of all transformers involved in the 2015 fire (irrespective of a possible PCB content of the oil) will need to be cleaned. In addition, PCB containing devices will have to be drained and conditioned for export and final elimination. All cleaning, decontamination and/or draining activities shall only be carried out in an airtight enclosure with airlocks, appropriate ventilation and water treatment due to the presence of PCDD and PCDF. These safety and protection installations shall be assembled/erected in one of the two then empty, cleaned and upgraded deposit on the San Lorenzo site.
80. The decontamination enclosure(s) shall be installed and upheld in the deposit, along with laboratory facilities and equipment, until all transformers and electrical devices, as well as the contaminated soil have been treated and/or eliminated in an ESM manner. Types of contaminants as well as the extent and severity of contamination present in the soil and ground affected by the 2015 fire shall be determined by systematic sampling and analytical investigation. The groundwater shall also be included in the analytical survey. Based on the results and findings from the analytical survey and assessment of the site, BAT/BEP procedures shall be defined and implemented to remediate and/or remove the contaminated soils. All PCB/PCDD/PCDF contaminated soils and associated wastes shall be exported for final ESM disposal.
81. Due to the different types and brands of stored transformers and absence of PCBs inventories in Paraguay, a precise figure of contaminated materials and wastes is not yet possible. However, taking into account the estimated number of equipment damaged, its distribution by type, the allocation of weights and taking as hypothesis that half of the oil was lost during the accident entering the environment, it is estimated that the total of metals and oils to be dealt with is approximately 3,000 tonnes of metal and 500 tonnes of oils.

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<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.  
GEF6 CEO Endorsement /Approval Template-August2016

#### Short-term actions (to be carried out during first-year of implementation)

82. Unfortunately, during the last year the situation has not changed.. Transformers located in the area, and PCB-contaminated wastes as result of the fire, were not managed properly immediately after the accident. Assuming the same soil conditions under the area affected by the fire, it can be assumed that the transfer of contaminants to the deeper layers of the soil towards the groundwater already occurred. The SEAM has expressed its concern and showed commitment to define an ESM strategy that allows to provide a definitive solution to the problem of the ANDE deposit of transformers and to guarantee an healthy environment to the surrounding population, in addition to the fulfillment of the international MEAs.
83. A very pragmatic approach and course of action is therefore required on the San Lorenzo site, in order to use the resources and time available in a most efficient manner.
84. It is therefore envisaged, in the short-term, to take immediate actions to manage the waste generated by the fire, including: the need for a comprehensive inventory of damaged equipment, the immediate removal of the damaged transformers and remaining waste, particularly if subsequent analysis determines the presence of PCBs. Immediate health considerations should include risk of exposure to PCBs, dioxins and furans, which should be done through the implementation of prevention programs within Paraguay.
85. Due to the huge number of phased-out transformers, the extremely limited space on the site, and of course the expected severe contamination caused by the 2015 fire, the PCB problem on the San Lorenzo site must be addressed with utmost priority.
86. Some additional urgent measures should be put in place to contribute to immediate risk reduction, including the restriction of access to highly contaminated areas through fencing, information and signs; primary containment of contaminant release to neighbouring water bodies and the corresponding monitoring and analyses; and ensuring safe access of project consultants and experts to the stored transformers and PCB waste storage during the PPG phase.

#### Medium-term Actions (to be carried out during the 2-3 years of project implementation)

87. Actions in the medium-term will focus on the development of a National PCB environmentally sound management plan. Thus, within the framework of the project activities, technical support will be provided to SEAM and ANDE in order to enforce environmental regulations, define and implement tools to monitor compliance with international laws, regulations and conventions, such as Stockholm and Basel Conventions.
88. Since no proper measures were undertaken immediately after the fire, is it likely that pollutants were released in the air through the fumes of the fire and transported by the wind, or leakages into the soil and water could have reached water sources in the surrounding area. It was estimated that 9,000 people around the area of the fire could have been exposed and approximately 300 people were treated for suspected cases of exposure the days following the accident. Health information must be updated to include improved analysis of exposed people from the local communities to ensure that the population is not affected by diseases commonly associated with pollutants released during the fire (PCBs, PFAS, PCDD, PCDF).
89. The fire accident which occurred in San Lorenzo also represents an opportunity for Paraguay to begin working on an ESM system for PCBs. As part of this ESM BAT/BEP procedures used to identify, mark, triage, store, transport and disposal of PCB-containing electronic equipments and wastes will be integrated in the standard procedures of the National Energy Company ANDE. The aim would be to avoid these type of events/accidents and to ship as many devices as possible in order to create the necessary space for all following activities required after the 2015 fire.

## **Component 1: Environmentally sound management and disposal of PCB-containing equipment, wastes and stockpiles**

90. The main objective of this project component is to address health and environmental problems related to PCBs through capacity building and on the ground interventions through SEAM and ANDE. UNITAR will provide execution support of the training components and UNIDO will provide technical assistance for outcome 1.1. and 1.2.) and investment for outcome 1.3.). The three outcomes of this project component are: Outcome 1.1 National PCB policy improved, capacity built and knowledge and awareness increased. Outcome 1.2 National PCB management plans ready for a smooth ESM and disposal of PCB-containing equipment and wastes; and Outcome 1.3. ESM and disposal of PCB –containing equipment and waste

### **Outcome 1.1. National PCB policy improved, capacity built and knowledge and awareness increased.**

#### *Output 1.1.1 National PCB regulations are in line with international standards*

91. This project will built on the existing PCB rules and regulations, however, will strengthen the institutional capacity for monitoring and controlling compliance, in all instances, with the rules set during implementation of the environmental management system for PCBs. Paraguay has drafted a bill to establish the mechanisms for environmental protection through the sound management of PCBs and equipment. This instrument will assist Paraguay to meet the SC obligations on PCB by 2028, and the project will further assist Paraguay to accelerate the process of approval of the bill and will assist on its enforcement.

92. Special focus will be on the electricity sector companies that handle PCBs. It should be stressed that ANDE (the National Agency of Electricity) manages about 96% of the electricity sector in Paraguay, thus it will be the main stakeholders for this project. This is important because in order to address PCBs a regulatory framework will be essentially developed and discussed with ANDE and the Secretariat of Environment (SEAM); afterwards, other minor stakeholders that would accompany the process through monitoring (government officials, laboratories, etc. ) and enforcement (SEAM, Ministry of Health and others) would be involved in the consultations. This way, ANDE and the other stakeholders will be linked with their extended producer responsibilities through the formulation of a specific national PCB management regulation. The regulatory institutions need also to facilitate the awareness raising and training of their personnel on this topic and its corresponding PCB issues. Therefore, training activities will be conducted for relevant government officials and staff from SEAM on the development of the PCB-related regulation, according to international standards. For this purpose, UNIDO is partnering with UNITAR to support Paraguay in the execution of the training and awareness activities through provision of international technical expertise.

#### *Output 1.1.2. National PCB management Centre established to support PCBs owners to properly manage and dispose of PCBs and related wastes*

93. Along with the Project Management Team, in coordination with the Technical Advisory Committee the National PCB Management Center will be established with members working on a voluntary basis which will be accounted as co-financing. This Center will support small PCB owners to properly manage and dispose their contaminated PCB equipment and PCB waste.

#### *Output 1.1.3. National data system set and analytical services strengthened to fully support inventory development and management of PCBs and related wastes, in line with international standards and best practices*

94. The project will also strengthen the national analytical capacity of national laboratories, which will in turn contribute to updating and completing the PCB inventories. Apart from the preliminary NIP inventory there is no detailed national-wide PCB inventory. ANDE has started to analyze around 6,000 equipments potentially contaminated with PCBs and up to now around 400 tonnes of PCBs have already been identified.

Unfortunately, the fire in October 2015 has resulted in an additional 300 tonnes of PCB-wastes. A training on the development of PCB database, in accordance with international standards will be conducted by international experts.

Output 1.1.4. Hazmat and risk management trainings conducted and awareness raised to reduced exposure of workers and the general public to PCB and related toxic wastes

95. Hazmat and risk management trainings and awareness raising for the the electricity sector, especially for workers, and other relevant general public groups (e.g. from University, laboratory, women associations selected through a competitive-based approach) will be conducted via face to face events and through online/downloadable training materials. Training and awareness raising will at least target 50 people from the electricity sector and general public groups. The Hazmat component has been requested after the fire incident at the Laurely PCB-storage place in October 2015 and will focus mainly on the firefighters, and selected staff from SEAM and other relevant offices linked to emergencies. As part of the PPG, a national Hazmat training has been organized and conducted by an international consultant in August 2017 to inform stakeholders about Hazmat, to prepare a situational analysis and recommendation for training purposes during project implementation (Annex H).

**Outcome 1.2. National PCB management plans ready for an smooth ESM and disposal of PCB-containing equipment and wastes**

Output 1.2.1. Inventory of at least 10,000 PCB-containing equipment units and PCB wastes carried out, including sampling oil and soils with sound analytical methodologies

96. This project output will support Paraguay to review and strengthen its data collection and management capacity regarding PCBs. A comprehensive PCB inventory with support of SEAM and ANDE will be conducted during the implementation phase of the project and will include the sampling and analysis of phased-out and in-use equipment (ca. 10,000). Through capacity-building at SEAM a national database will be developed, which will also provide a platform for characterisation of PCB waste streams. This characterization will then facilitate undertaking a feasibility study of using available, robust, and cost-effective technologies to promote ESM and disposal of PCBs. The evaluation of disposal methodologies will take into account the levels of PCB concentrations and the condition of the equipment. It is expected that all large and medium sized transformers built with sampling valves will be tested. The location of some storage facilities, such as San Lorenzo and Boggiani site are already identified, additional information on hot-spots and storage sites will be provided by ANDE and SEAM.
97. ANDE is already conducting inventory activities and assigning significant resources to PCB management activities. However, the model applied can be improved through face-to-face training sessions in order to enhance business practices related to PCB management that will lead to significant cost reductions, storage and disposal procedures in line with international standards to assure ESM of PCB containing equipments.
98. Not only the PCB content of transformers in use will be checked, but also the contamination of transformers out of use or in reserve. Rigorous examinations will also include spare oils and other equipment that could possibly contain PCBs (for example capacitors, voltage regulators circuit breakers, heat exchangers, oil cisterns and pipe systems, etc.).
99. All transformers will be sampled even if they are of recent date of manufacture because a later unintended contamination of the transformer could have occurred. If a device cannot be sampled for technical reasons (for example capacitors), it will be regarded as containing PCB until the sampling performed at the time of the phase out proves the opposite.

100. Sampling boxes containing basic equipment will be prepared and be in use during the sampling activities, in order to ensure access to the necessary materials at any time. Glass bottles will be used for liquid samples and glass or plastic containers for solids. If a high PCB content is expected (e.g. in case of pure PCB) glass bottles will always be chosen, because PCB can diffuse through plastic containers.
101. Appropriate Personal Protective Equipment (PPE) will be mandatory during the sampling activities. In order to prevent the skin from getting in contact with PCBs, one-way protective gloves must be worn, and eyes will be protected against possible oil splashes by wearing goggles. The choice of the adequate personal protective equipment depends will depend on the tasks to be performed, the associated risks as well as the condition of the electrical devices to be checked (leakage, closure to sensitive areas like food processing industries, etc.).
102. In case of phased out and drained transformers the best sampling procedure will be defined. Even drained transformers still hold a few litres of oil at the bottom of the device. If there is not enough oil left to sample the transformer via the drain tap, the device will be sampled through an opening in the top. Stiff tubes (e.g. glass or PE) can be used to take a sample of the oil at the bottom of the transformer. If there is no oil at all left in the device, it will be decided if solid materials from the active part of the transformer shall be sampled and analysed or if the device shall be considered PCB containing. To complete the inventory, all potential PCB holders within the electricity sector, the oil and mining sector, and private companies will be included that have their own transformers. This essential to determine the types and quantities of contaminated equipment, and contaminated oils and wastes along with their corresponding PCB concentrations. Data collected during the inventory will be included in an information system that will facilitate the continuous updating of the PCB findings through the use of methods for field collection and data analysis.
103. To save analysis costs and time screening tests will be used whenever applicable. Nevertheless, it has to be considered that these methods test for the presence of chlorine in the sample being examined. As a result other chlorinated compounds, which can be part of the sample, could cause false positive results because the analysis method assumes all chlorinated compounds are PCBs. Therefore, if a screening test shows a positive screening result (PCB > 50 ppm), verification an a accredited laboratory by gas chromatography will always be necessary.
104. As soon as a device has been identified as PCB free, PCB suspect or PCB containing, it will be marked with a clear label as a precautionary measure. According to the result of the analysis of a sample or to the examination of the manufacturer's plate on a capacitor, a harmonized and weatherproof label will be affixed to the equipment. This shall guarantee that the equipment can be separated easily and correctly for the disposal at the time of the dismantling activities. In addition, in case of an incident it ensures that the hazards of the situation can be assessed immediately at first glance from the color of the label. The national inventory will be updated and the information included in a database to allow the proper reporting to the Stockholm Convention and the monitoring of the elimination of contaminated equipment and oils. The updating of the inventory information will be assisted with portable and analytical field equipment for the identification of contamination and the determination of PCB concentrations.
105. All wastes generated during the sampling and screening activities will be considered PCB contaminated. Therefore, UN approved packaging (steel- or PE drums, big bags, etc.) for both, liquid and solid waste will be available. Furthermore, all used reagents, test kits, etc. will be collected and eliminated as PCB wastes.

Output 1.2.2. ESM and disposal plan for PCBs developed, including cost-effective disposal plan

106. Prior to the phase-out of PCBs during and beyond this project, the development of an ESM and a disposal strategy for the national elimination plan, including identification of a technically and economically feasible disposal alternative for the amounts beyond the 700 tonnes of PCBs tackled by this project is required.

107. The choice of technique will be based on previous analytical assessment, the extent and concentration of contamination, the matrix and the type of area (e.g. industrial, agricultural, etc.). It will also take into consideration that PCBs are a mixture, which may undergo biological degradation only to a certain extent as highly chlorinated PCBs often remain intact (persistent).
108. Once the alternative technologies for PCB elimination/treatment are defined, a national elimination plan corresponding to the findings described in paragraph 14 will be assembled based on the individual elimination plans that the PCB owners will develop with assistance of the project. The national management plan will include specific guidelines and a time line that will consider the deadlines for the elimination of the existing inventories in line with Paraguay's commitment to fulfil the Stockholm Convention. The individual elimination plans will allow PCB owners to monitor their elimination progress during and beyond project life cycle and will ensure that PCB owners are actively involved in project execution. The disposal plan will define dates of decontamination or disposal and replacement for every unit of equipment. In addition, financial planning for the disposal costs as well as for new equipment can be included in the plan. According to the risk that PCB containing equipment or contaminated sites and soil pose to humans or the environment there are different priority levels:
- (1) PCBs that are stored as spare oil, as waste or as electrical devices out of service have to be disposed of no longer than three years after their declaration in the frame of the national inventory,
  - (2) PCB containing devices
    - of PCB concentrations higher than 0.05 mass percentages (500 mg/kg)
    - in a bad technical condition
    - situated near places of a higher risk for the people (hospitals, medical centres, commercial centres, schools and universities, food industries, water and sanitation services, highly frequented buildings) have to be decontaminated or disposed of with priority,
  - (3) All other electrical equipment with a PCB concentration between 0.005 and 0.05 mass percentage (50 and 500 mg/kg) can remain in service until the end of their useful life, but no longer than the year 2025, and
  - (4) PCB polluted soil and/or sites with direct impact to the environment or potential health risks, such as but not restricted to e.g. PCB contaminated agricultural land or sites close to food processing areas.

Output 1.2.3. Assessment of PCB/u-POPs pollution due to fire on ANDE PCB-storage facilities

109. On October 14th of 2015 a fire occurred at ANDE in San Lorenzo which affected a high amount of transformers and PCB-containing equipments. An assessment of the surrounding PCB/ u-POPs pollution is essential to assess the scope of contamination. Under this project activity, soil and groundwater samples, from the site involved in the fire, will be systematically analyzed in different horizons to determine and monitor PCDF/PCDD/PCB and likely also hydrocarbons, PAH, Pb, Zn, Cd, Cr, CrVI and Hg contamination. It will be also considered that during the incident, there was formation of PCDD/PCDF regardless if individual transformers did contain PCB or not. Furthermore by wind and heavy rainfalls soot, ashes and contaminated particles have likely been uncontrollably spread also outside the ANDE San Lorenzo site.
110. Under this project output, a methodology/strategy will be established in order to survey and assess the contamination of the soil and possibly groundwater on the site affected during the 2015 fire. The appropriate strategy will be determined by the specific situation of the San Lorenzo site, using a well approved and systematic approach for the sampling (Grid). Different approaches and sampling patterns are possible, such as for example random, systematic, judgmental, stratified or nested sampling patterns. The first step will be a visual inspection of the site, as oily parts and spills can usually be distinguished visually. PCDD and PCDF contamination is not visible, however, therefore a site specific strategy for the problem will be defined and



applied. Soil samples from different areas within the grid and from different depths, as well as groundwater samples, will be taken. Piezometers will be installed to regularly sample and monitor the groundwater.

### **Outcome 1.3. ESM and disposal of PCB-containing equipment and wastes**

#### Output 1.3.1. Current PCB interim storage facilities upgraded and operational

111. After the fire occurred at ANDE's Laurelty site (San Lorenzo), a re-assessment of the situation was essential during PIF stage. The proposed project has been adjusted to treat up to 700 tonnes of PCB-contaminated transformers and capacitors both from among in-service and out-of-service equipment, including stored wastes and 300 tonnes PCB-contaminated equipment resulting from the fire.
112. Once the storage facilities at the San Lorenzo are empty, they shall be cleaned and upgraded in such a way that they can be used as future areas for the treatment and interim storage of PCB and PCDD/PCDF wastes respectively. The surroundings of the storage areas shall be cleaned and upgraded for future use as material storages and loading areas (e.g. for 20' and 40' Box Containers).
113. To the extent possible, the interim storage will be upgraded, mainly using co-financing from ANDE, to ensure an environmentally-sound storage PCB containing equipment and wastes, for example:
  - The floor of the storage must be solid and tight. The storage must be walled and protected against the weather on all sides.
  - All entrances to the storage must be marked with an appropriate warning, and access for unauthorized people must be prohibited.
  - The area must be fenced and controlled.
  - Emergency procedures and best working practices must be displayed.
  - The building should have some openings for permanent ventilation (ventilation systems with filters).
  - Increased risks of fires must be excluded (no wooden shed, no storage of inflammable goods in the same building or in the neighbourhood). A smoke and fire alarm system should be installed.
  - Fire extinguishers (powder) and absorbents (e.g. sawdust) must be available and easy accessible.
  - The building should be separated in different areas (reception, handling, separate storage of different waste categories, equipment, etc.)
114. The Basel Convention recommended procedures for the storage of PCB waste must be followed.
115. The space created on the San Lorenzo site, will be used for the future remediation and treatment activities for the transformers damaged by the fire. Approximately 200 tonnes of PCB containing transformers will be identified, removed, packed, exported and eliminated in an environmentally sound manner and according to the Chemicals and Waste Conventions. The analysis of alternative PCB treatment options (e.g. de-chlorination applied to contaminated transformers) will allow that the remainder of the PCB-contaminated transformers can be effectively and economically treated within the country. PCB containing devices should be packed safely and in compliance with the applicable laws as soon as they have been phased out, even if their disposal takes place at a later stage. Irrespective of the quality of the temporary storage, the final and environmental sound disposal of the waste must be scheduled and coordinated so that storage will not exceed twelve months. Generally, electrical equipment should only be phased out and stored, once an appropriate method of disposal has been chosen.

#### Output 1.3.2. At least 700 metric tonnes of PCB-containing equipment and waste disposed of and/or decontaminated

116. The PCB disposal plan to phase out up to 700 tonnes will be developed based on the results of the PCB inventory, particularly the quantities of PCBs and their concentrations. Then, the search for the appropriate

elimination/treatment technology will be assessed taking into consideration, among other issues, the amounts of PCBs within three main concentration ranges (0 to 50 ppm; 50 to 500 ppm, and above 500 ppm) and the economic viability of the candidate technologies for the amounts within each group. This will provide the inputs to help decide whether the contaminated oils and equipment should be treated through de-chlorination (within the country) or if they should be exported (possibly for concentrations above 500 ppm).

117. In order to avoid overlapping in project activities, ANDE, as one of the main actors in the project, proposed to dispose approximately 100 tonnes of equipment and PCB-contaminated wastes located in warehouse No. 1. After consultations with SEAM, ANDE announced a call for tenders (IDB 2891/OC-PR) with the aim to find the company/consortium to decontaminate and dispose of equipment present in the premises: treatment of equipment contaminated with less than 500 ppm of PCBs; disposal of equipment and contaminated oil with more than 500 ppm PCB.
118. In conjunction with the ANDE initiative, additional 700 tonnes of transformers and equipments stored outside the warehouse will be sampled, screened and disposed under the leadership of UNIDO and in coordination with SEAM and ANDE. First step will be the sampling and analysis by chromatography of the transformes and equipments stored open air, and affected by the 2015 incident, to determine the presence and concentration of PCBs in the dielectric oils. Once the results of the analyses are obtained, the transformers will be managed either through export or national decontamination unit according to their amount and PCB concentration level in the oils, as follows:
  - i. Transformers not affected by the fire with a concentration of PCBs > 500 ppm will be separated, conditioned and stored for disposal;
  - ii. Transformers not affected by fire with a concentration of PCB < 50 ppm will be considered free of PCB and ready for commercialization;
  - iii. Transformers not affected by fire, contaminated with PCBs with a concentration level between 50 ppm and 500 ppm, will be treated in situ, until a concentration of less than 50 ppm is reached in the oils. Subsequent to this will be arranged for free marketing, after approval by the Ministry of the Environment (SEAM);
  - iv. Transformers affected by fire with a PCB concentration  $\geq$  50 ppm will be considered as contaminated equipment, and will be separated, conditioned and stored for disposal;

## **Component 2: Project Monitoring and Evaluation**

### **Outcome 2.1. Monitoring and Outcome 2.2. Evaluation**

119. Project monitoring and evaluation (M&E) will be conducted in accordance with UNIDO's established guidelines for conducting mid-term reviews and terminal evaluations of GEF-funded projects and GEF procedures. Monitoring will be based on indicators defined within the project results framework and complemented by the annual work plans. The GEF tracking tool will also be used as a monitoring and evaluation tool, and will be submitted three times during the duration of the project (CEO approval, mid-term and at project closure).
120. UNIDO as Implementing Agency will involve the GEF Operational Focal Points, national executing counterparts and project stakeholders at all stages of the project monitoring and evaluation to ensure that the results lead to improved current and future project design and implementation.
121. According to the GEF and UNIDO Monitoring and Evaluation policies, follow-up studies like country portfolio evaluations and thematic evaluations can be conducted. All project partners and contractors are obliged to (i) make studies available, and provide reports or other project- related documents, and (ii) facilitate interviews with staff involved in the project activities.
122. For further details, please refer to the M&E, Section C in this document.

4) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF and co-financing

123. The proposed GEF project will assist the country to strengthen human and institutional capacities to manage the PCB issues in Paraguay. It will introduce environmentally-sound management of PCBs allowing the dissemination and replication of the best practices for PCB management and disposal.
124. Without this GEF-assisted project, PCB equipment will continue to be managed within the same operational scheme as non-PCB equipment giving rise to widespread cross-contamination. The threats posed by equipment at locations cognized in Annex A, Part II of the Stockholm Convention as presenting particular risks, will remain. Obsolete equipment will continue to be stored in inappropriate sites and to be disposed of carelessly to local waste handlers, principally for metal reclamation.
125. The GEF funding will be used to build national institutional capacity and provide a comprehensive training with the goal of training a national team of experts on PCBs. GEF finance will also be used to increase capacity for a functional reference laboratory including training, bearing in mind that Paraguay is not part of the GEF Global Monitoring Plan project and that the upgraded laboratory will be part of this project in order for PCB owners to have a confirmative PCB contamination results for an appropriate final disposal decision making process. The PCB inventory will be finalized and the existing PCB storage facilities will be upgraded. ANDE is already conducting inventory activities and assigning significant resources to that effect. Similarly, the locations of the storage facilities are already identified (in San Lorenzo and Asuncion as well as Boggiani) and co-financing through ANDE will be provided to this project. In the case of Boggiani, considering that it is in this place where transformers are repaired, it is crucial that the project establish procedures and controls for the detection of PCBs, as well as differentiated flows of equipment and oils depending on their PCB content. The actions that the project takes in Boggiani will affect the health of the whole system making it sustainable.
126. Regarding key partners, ANDE will make available its technical staff, facilities and upgrade of storage facilities to ensure a successful project as its co-financing share..
127. ANDE has also received a loan from the Inter American Development Bank (IADB), which mainly will be used for the export of 100 tonnes of pure PCB for final disposal- These activities have already started in 2017. This project will coordinate its activities with the lessons learned from the disposal activities carried out under the IADB loan.
128. UNIDO's approach on PCB management focuses on the delivery of assistance to create the required fundamental capacities within government, institution and PCB owners to comply with the PCB-related obligations under the Stockholm Convention on POPs. It provides technical assistance based on environmentally-sustainable approaches including POPs pollution reduction/elimination, industrial process changes, modified or substitute materials and products, BAT/BEP and ESM of POPs chemicals. UNIDO PCB projects endeavor to strengthen regulatory and legislative infrastructures and relevant institutions at national and local levels to manage PCB-containing equipment and waste in an environmentally sound manner. More importantly, it strives to transfer of environmentally-sound technologies to institute know-how for local PCB treatment and elimination. Environmentally sound PCB management practices are put in place at PCB-owners reducing PCB releases and risks to human and environmental health. Raising targeted public awareness and dissemination of information is a major component of all UNIDO PCBs projects.

5) global environmental benefits (GEFTF)

129. The project falls within the GEF-6 chemicals and waste focal area, more particularly under CW-2 Program 3, as it will assist eligible parties to reduce and eliminate POPs listed in the Stockholm Convention by supporting the application of technologies, techniques and approaches for PCBs.
130. As outlined in detail in para 4, the project will ensure that 700 tonnes of PCB owned by the private sector will be finally eliminated so that those hazardous compounds will not enter into the global environment causing risks to human and environmental health. This project will thus contribute towards the national commitments made under the Stockholm Convention to in achieving the goal of environmentally sound management (ESM) of PCBs waste by 2028.
131. Through co-financing, a long-term strategy for environmentally sound management of PCB-containing equipment and waste, including a business model, will be developed to ensure sustainability of the project.
132. On a detailed level, the project will benefit both local communities nearby the PCB storage place and globally, through reduced impact of PCBs releases to the environment and avoiding long-distance transportation of PCBs.
133. This project will help identify PCB applications and contaminations in Paraguay, and specifically on the San Lorenzo site, Boggiani, Capiata and Ciudad del Este. The implementation of the project will enable an environmentally sound handling and elimination of PCB devices and wastes.
134. The reduction of exposure not only applies to people and areas in the vicinity of the San Lorenzo and other PCB management sites, but also has positive effects on a national and global scale. It is well known that PCB/PCDD/PCDF are all transported over long distances to regions where they have never been used or produced before by evaporation, movement with the air streams, condensation and deposition on the ground.

#### 6) innovativeness, sustainability and potential for scaling up

##### **a) Innovativeness**

135. The innovativeness of the project approach lies in the combination of GEF funding, technical assistance through UNIDO and national activities (especially regarding the IADB) for the set-up of an environmentally sound management system and the final disposal of PCBs. Especially after the fire incident in October 2015, this approach offers a great opportunity for paving the way towards proper management of PCB-containing equipment, oil and wastes in Paraguay. However, all involved stakeholder need to work hand-in-hand to ensure project success and long-term sustainability.
136. This project will act as a systematic push for the country to piece together its existing environmental / PCB management regulations and enforce the relevant bill into law. (para. 57)
137. This project learns from the UNEP-GEF project and uses its result as baseline reference.
138. On the technology side, the project will assess the most environmentally sound and economically feasible technologies and practices that will eliminate PCBs. An environmentally sound management system along with a PCB-related policy framework will ensure that PCBs are managed properly.

##### **b) Sustainability**

139. The project will reduce PCB releases to the environment by raising the political will to strengthen and codify the existing regulatory framework and supporting its implementation through the strong involvement of ANDE; it will also provide technical tools and training programmes to stakeholders, introduce best practices in the PCB management scheme, facilitate interim storage and disposal of PCBs in an environmentally sound manner. The project activities will be reinforced by the establishment of a technical advisory committee and the knowledge capacity of a SEAM staff member for long-term technical existence beyond the project. Lessons learned from UNIDO PCB project implemented in the region (Peru, Bolivia, Guatemala) will be valuable for effective implementation and administration of the project.

**c) Potential for scaling up**

140. The project will strengthen the PCB-related framework, an environmentally sound management system and will set-up a long-term environmentally-sound management system of PCBs beyond the project. Thus, the project will build the basis for the complete elimination of PCBs in the country in order to achieve the target of elimination of PCBs until 2028, described under the SC. The results and lessons learned of this project could be used as reference to PCB issues in the same region in future.

A.2. *Child Project?* If this is a child project under a program, describe how the components contribute to the overall program impact.

Not applicable for this project

A.3. Stakeholders. Identify key stakeholders and elaborate on how the key stakeholders engagement is incorporated in the preparation and implementation of the project. Do they include civil society organizations (yes x /no )? and indigenous peoples (yes  /no x)?

141. Management of PCBs include a number of sectors and actors. Key stakeholders identified in the public and private sector, such as the Secretariat for the Environment (SEAM), Ministry of Industry, Ministry of Health, Ministry of Labour, and Ministry of Energy, will be encouraged to actively participate in the project. These ministries will participate, provide inputs and be consulted during project design. SEAM will execute the project at the national level with the assistance of skilled national and regional partners. ANDE and other utilities will play a major role in the project. ANDE is a decentralized public company of the electricity sector and has already analyzed PCB equipment at its PCB storage locations.

142. As PCB owners, ANDE and other companies will be encouraged to work jointly with government and other actors in the project and participate in project decision making processes through a Technical Advisory Committee which is coordinated by the PCB Management Unit.

143. Civil Society representatives, academia and ethnic groups will be also consulted on the decisions to be taken in the project and will be informed and consulted on progress made by it. The National Center of Toxicology along with the Ministry of Health will provide basic information to be used for the awareness-raising strategy.

| Stakeholder | Responsibility  | Role in this project  |
|-------------|---|---|
| ANDE        | <ul style="list-style-type: none"> <li>✓ Business investment and maintain or increase income</li> <li>✓ Workers protection</li> <li>✓ Mitigation of political pressure for environmental risks</li> </ul> | ANDE is the main electricity stakeholders and thus main partner for the PCB inventory, ESM and final disposal strategy. |

|                           |   |  |
|---------------------------|---|--|
| Recycling sector          | <ul style="list-style-type: none"> <li>✓ Getting training</li> <li>✓ Sound disposal/management option</li> </ul>  | There are SMEs in Paraguay which are involved in recycling activities of scrap metals from transformers. |
| SEAM                      | <ul style="list-style-type: none"> <li>✓ National policy development</li> <li>✓ Protection of human health and environment</li> </ul>   | SEAM is the national executing partner.  |
| Laboratories and Academia | <ul style="list-style-type: none"> <li>✓ Reinforcing analytics, knowledge and research</li> <li>✓ Access to training programme</li> <li>✓ Provide scientific basis and evidence for interventions</li> </ul>          | Laboratories (through an official bidding) will be involved in PCB screening and analytical activities.  |
| UNITAR                    | <ul style="list-style-type: none"> <li>✓ Regional policy coordination</li> <li>✓ Knowledge Management</li> <li>✓ Information Exchange</li> <li>✓ South-South cooperation</li> <li>✓ International training</li> </ul> | UNITAR will be an executing partner focusing on training and awareness raising activities in Paraguay.   |

A.4. *Gender Equality and Women's Empowerment.* Elaborate on how gender equality and women's empowerment issues are mainstreamed into the project implementation and monitoring, taking into account the differences, needs, roles and priorities of women and men. In addition, 1) did the project conduct a gender analysis during project preparation (yes x /no )?; 2) did the project incorporate a gender responsive project results framework, including sex-disaggregated indicators (yes x /no )?; and 3) what is the share of women and men direct beneficiaries (women 40%, men 60%)? <sup>9</sup>

144. Gender considerations will be an integral part of the project strategy in consideration of the Gender policies of GEF, UNIDO and Paraguay (Annex J). This is because efforts to ensure the Sound Management of Chemicals, especially POPs, have important gender dimensions. In daily life men, women and children are exposed to different kinds of chemicals in varying concentrations. Biological factors, notably size and physiological differences between women, men, adults and children, influence susceptibility to health damage from exposure to toxic chemicals. Social factors, primarily gender-determined occupational roles, also have an impact on the level and frequency of exposure to toxic chemicals, the types of chemicals encountered, and the resulting impacts on human health.

145. Regarding the situation in Paraguay, it is expected that the majority of workers employed by electricity companies and the industrial and mining sectors, maintenance companies, junkyards, large consumers and industries, among others, are men. The situation is as follows:

- **MANUFACTURING:** During the manufacturing processes of electrical equipment (transformers) the majority of women are working in the winding processes (100%), where more manual work is required. In all other processes such as boiler, painting, connection or final assembly the workers are exclusively men.
- **MAINTENANCE AND REPAIR OF EQUIPMENT:** exclusively men
- **IDENTIFICATION AND SAMPLING WORK:** field work for identification and sampling is rather mixed (50% women and 50% men)
- **LABORATORY ANALYSIS:** Laboratory analysis is carried out mainly by women (80% women and 20 % men)

<sup>9</sup> Same as footnote 8 above.

- TEMPORARY OR FINAL DISPOSITION: During the transfer and packing of equipment the majority are also male (we could use the percentages of women in fireworkers, for example: 1 woman for every 5 men)
- MANAGEMENT, LOGISTICS AND PLANNING: 50% women and 50% men

146. In addition, there might be women and children in the communities surrounding electric maintenance facilities, who spend most of their time in potentially PCB-contaminated areas which represent high human health risks. These gender dimensions will need to be addressed present in both the project and on policy level interventions regarding the sound management of chemicals in general and of PCBs in particular.
147. For example, , the fire at one of ANDEs PCB storage place imposed great risks to human health, which is also true for the stored PCBs and PCB-contaminated soils. Thus, the project will ensure that relevant stakeholders are aware and have adequate knowledge of environmentally sound management of PCBs and special attention is to be given to women and children working or living close to the storage places. Stakeholders will be informed about gender mainstreaming through regular project meetings and be kept informed about gender-related activities. In line with UNIDO's gender mainstreaming policy of environmental management projects, the project will be prepared and implemented in a gender-sensitive and gender-responsive manner, e.g. (i) through workshops (measured as participation by male/female; gender-specific presentations; gender-specific information material), (ii) trainings (measured as number of male/female, gender-specific presentations, gender-specific information material), (iii) gender-specific awareness-raising campaigns (e.g. targeted to women's group; gender-specific knowledge materials) and (iv) gender-specific technical trainings, wherever necessary. It is aimed to increase the number of women underrepresented in processes along the PCB life cycle, e.g. by increasing the number of women working among staff in the technical domain of reparation, maintenance and final disposal to 25%, if possible. However, it needs to be noted that especially these activities require heavy lifting and might not be feasible for each women.
148. To achieve and monitor gender mainstreaming during project implementation, efforts will be made to ensure that recruited staff either has existing knowledge on integrating a gender perspective or their capacity will be built in this area, or they will be trained. (e. g. Gender Courses on UN Women's eLearning Campus <https://trainingcentre.unwomen.org>). The work of the to staff to be recruited will also include the collection, analysis and monitoring of sex-aggregated data along the PCB-cycle. The baseline could be data collected during PPG (paragraph 158) and their in-depth assessment and monitoring.
149. Regarding the gender-responsive trainings, it is aimed to include an available national gender expert with technical knowledge to advise on the gender-sensitive implementation of activities such as trainings and development of training programmes and to ensure that gender issues are addressed during the implementation phase. If such person is not available a technical knowledgeable person with gender experience will be recruited.
150. In addition, since women and children are the most impacted from the adverse effects of PCBs, awareness raising materials specially designed to facilitate women's participation in the project will be prepared. An assessment of the impact of PCBs in women and children will be conducted as part of the awareness raising and training materials. For this purpose, gender focused group will be consulted during the preparation of gender-related activities.

*A.5 Risk.* Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

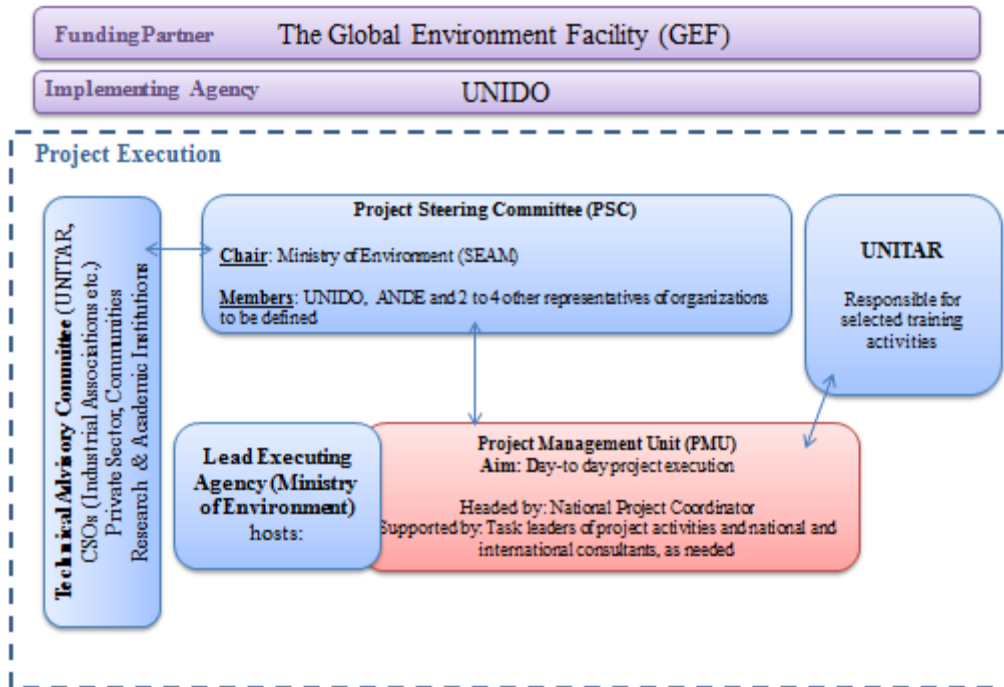
151. Potential risks, potential rating and mitigation measures identified during PPG are summarized in the table below.

| Risk  | Rating*                       | Mitigation  |
|---|-------------------------------|---|
| Specify the risk  | Low (L), Medium (M), High (H) | Propose a relevant mitigation measure   |
| Private owners would not report their PCB-containing equipment and wastes.  | L                             | The existing regulatory framework will be upgraded to require the reporting of PCBs and on site institutional inspections will be required. Private enterprises will be informed about their obligations under the law.<br>GEF funded disposal and treatment of PCB wastes and potential recovery of valued metals and mineral oil would help in overcoming PCB owners' reluctance to cooperate with the project. |
| Technical staff, participating in the project implementation, and, in particular, having contact with PCB-contaminated equipment will be excessively exposed to PCB harmful influence.  | L                             | The technical staff will be trained on proper handling of PCB wastes and equipment. Relevant guidelines will be developed or adjusted and introduced at the technical project facilities and for the transportation teams.<br>Protective clothes and equipment will be provided to the technical staff.<br>Places for PCB-waste storage will be properly guarded to prevent admittance for non-authorized staff.  |
| Contamination of the environment during transport / handling of the PCB-containing equipment. There is a danger that some PCB-wastes could be disposed of illegally at unauthorized places, thus increasing environmental pollution and creating new "hot spots". | L                             | The in-depth inventory will record locations, volumes, weights and other conditions of PCB-containing equipment and wastes. The project management team and the environmental authorities will be able to follow the disposal paths of the equipment and wastes until safe disposal.  |
| Climate Change Risks might include unexpected weather events that disrupt the project process on sites, causing further decontamination   | L                             | Mitigation and upscaling measures will be taken at the storage facilities to reduce the risks associated with extreme weather events.   |

*A.6. Institutional Arrangement and Coordination.* Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.



## Institutional arrangements



152. The GEF Implementing Agency for the Project will be UNIDO, with headquarters in Vienna and a regional office in Montevideo, Uruguay. The executing partners will be with SEAM and UNITAR, which latter is a supplementary executing entity that is tasked to carry out capacity building activities.
153. SEAM will enter into contractual arrangements with UNIDO, initially including capacity building and policy activities as well as project managerial tasks included in outputs 1.1.1, 1.1.3, 1.2.1, 1.2.2., 1.2.3. and 1.3.2 in accordance with UNIDO's procurement procedures. Based on a competitive national selection procedure SEAM has endorsed CEAMSO as national executing partner for the administration of project funds. The endorsement letter for this selection is attached in Annex L. Once the project is approved, UNIDO will enter into contractual arrangements with the endorsed national executing partner CEAMSO.
154. A National Project Coordinator will be recruited directly by UNIDO to carry out national project oversight activities in order to ensure that project activities are fulfilled. The Project Coordinator reports directly to UNIDO's project manager.
155. The National Project Director from SEAM, provided as government contribution, will monitor the project on behalf of the Government and chair the Project Steering Committee (PSC), assisted by the Project Coordinator as PSC Secretary. The PSC will consist of SEAM, ANDE and UNIDO to be appointed during project implementation start. Among its functions, the Project Steering Committee should approve the Annual Work Plan (AWP) and the Annual Budget. Any changes/amendments proposed to be done by the Project Steering Committee to the project and/or to the AWP or budgets should be done in accordance with approved project document and GEF policy C.39/Inf.09, UNIDO rules and regulations, and they have to be approved by UNIDO before they can enter into effect.
156. A Technical Advisory Committee (TAC), chaired by SEAM, will be established for providing technical and practical input and coordination for project execution. The Technical Advisory Committee will consists of a

minimum of five stakeholders from the electricity sector, research and academia. They will advise on technical issues during project implementation.

157. UNITAR will also be a co-executing partner of this project and will enter into contractual arrangement with UNIDO for training and like activities.
158. In addition, UNIDO shall provide execution functions to the government for procurement, recruitment of international experts, and monitoring and evaluation requirements (Annex K).
159. Contractual arrangements will be made through UNIDO based on an open competitive basis for PCB screening and analytical equipment as well as analytical services under output 1.2.1. Under output 1.3.2. services for the export and final disposal of PCB-containing equipment and/or national decontamination equipment will also be made through an open competitive basis by UNIDO Procurement Services Division. The decision about the final treatment (export or national decontamination) will depend on the quantity of PCB-contaminated equipment and its ppm level in combination with economic criteria. Full or partial title and ownership of equipment purchased under the project may be transferred to national counterparts and/or project beneficiaries during the project implementation as deemed appropriate by the UNIDO Project Manager in consultation with project stakeholders.

#### **Coordination with other GEF-projects and other initiatives**

160. This UNIDO-GEF project will coordinate its activities with on-going national projects and will built upon lessons learned from similar projects in the region. For example, the project will also coordinate activities and exchange experiences with the ongoing PCB activities in the region, such as the GEF-UNIDO ongoing projects for ESM of PCBs in Peru (GEF 3709), Bolivia (5646) and Guatemala (5816). Additionally, the project will access training and guidance materials developed during previous PCB projects in the region, such as the regional GEF-UNEP project (GEF ID 3814) in Chile and Peru, entitled “Best Practices for PCB Management in the Mining Sector of South America”, where training on action plan development and identification and analysis of PCBs took place. Also materials developed by the PCBs Elimination Network (PEN) will be used to avoid duplication of efforts.

*A.7 Benefits.* Describe the socioeconomic benefits to be delivered by the project at the national and local levels. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?

161. The project mainly deals with reduction of release of and exposure to PCBs based on a full implementation of the Stockholm Convention on POPs. From the economic standpoint, the implementation of the Stockholm convention implies the internalization of environmental costs for PCB owners; this at the same time represents a benefit for the community and the country general economy due to reduced costs associated with chronic of fatal diseases.
162. The main beneficiaries of the project activities are the general public, consumers and communities which may be exposed to PCBs released into the environment. Health risks for people will decrease once a proper regulating environmental and goods quality is in place and enforced.
163. Social sustainability will be ensured by strengthening public participation and ensuring access to project outcomes to the general public. In particular, local communities, women and children will be involved in project activities to ensure that risks and problems associated with POPs will be properly addresses and mitigation strategies can be formulated. General public will also be informed about health and environmental

risks related to PCBs and benefits from eliminating its production, use, storage, transport and disposal in an environmentally-sound manner.

164. The net economic benefit for the country is therefore the difference between the increased cost for the owner of PCB equipment and the reduced cost for the country and the population at large. For instance, it is well known that, despite the economic support they may receive from the implementation of GEF projects, for the electric sector the implementation of PCBs requirement set under the Stockholm convention is a net cost, as it imply the environmentally sound disposal or treatment of PCBs contaminated equipment and in some cases, the replacement of PCBs transformers with new transformers. The aim is to shift part of the cost of PCB environmental hazard from communities to the owners.

165. The project intends not only to ensure the removal and destruction of around 700 tonnes of PCBs and PCB containing equipment and waste; it also intends to establish an inventory of at least 10,000 PCB-containing equipment units and PCB wastes, including sampling in oil and soils and with sound analytical methodologies.

*A.8 Knowledge Management.* Elaborate on the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives (e.g. participate in trainings, conferences, stakeholder exchanges, virtual networks, project twinning) and plans for the project to assess and document in a user-friendly form (e.g. lessons learned briefs, engaging websites, guidebooks based on experience) and share these experiences and expertise (e.g. participate in community of practices, organize seminars, trainings and conferences) with relevant stakeholders.

166. The project will build on existing experience gained in similar programmes/projects from the LAC region, as well as from other geographic areas covered by UNIDO. UNIDO has been implementing a number of projects with similar approaches regarding PCBs and ESM of POPs, e.g. in Guatemala and Bolivia. Lessons learned from UNIDO's previous PCB projects will be incorporated into the project implementation to ensure harmonization of the approaches within the national context.

167. Information exchange between these initiatives is expected to take place via accumulated knowledge at UNIDO's Regional Office in Montevideo, Uruguay, which provides technical oversight to ongoing UNIDO PCB initiatives in the region and through engagement of qualified technical expertise that will be beneficial to the project in Paraguay. Involvement of other UN agencies working on chemicals and capacity building (i.e. UNITAR) will be ensured so that the best quality of services can be provided to Paraguay and that experiences gained through this project are fully disseminated in South America and beyond.

168. Trainings will be used as knowledge management activity. Specific trainings on PCBs management plans, regulatory framework, risk reduction, PCB storage and elimination, etc. will be provided by national and international experts to share knowledge on how to identify PCB and how to establish mechanism in industry to prevent leakage and cross contamination, safe handling and storage of the equipment in the industry site.

169. The Stockholm Convention's initiatives, like the PCB Elimination Network (PEN) and participation in collective information events such as Webinars organized by the Basel/Stockholm Conventions Secretariat will be utilised as knowledge management tools. At the national level, during project implementation, a web platform for sharing relevant project information will be designed and launched. Public access will be granted to all resources which are of public relevance, such as project performance, guidance on PCB material management, environmental impact assessment documents etc. User-friendly summaries and multi-media materials based on the project activities will be uploaded on the platform periodically, and proposed for partners' official web sites. Furthermore, the project will plan for workshops to be held with the purpose of introducing previous experiences on POPs and PCBs management from other countries.

170. The Government of Paraguay, including all of the national stakeholders (e.g. ANDE), will be the custodians of the data, information, guidance, and outputs generated under the project. National meetings on lessons learned

will be held for each major milestone completed, such as inventory and database development, regulatory framework review, and disposal activities.

## **B. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:**

B.1 *Consistency with National Priorities.* Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions such as NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.:

171. Paraguay continues to address its obligations under the Stockholm Convention. It has completed and submitted its National Implementation Plan (NIP) on POPs in 2007 and the Government of Paraguay is conducting major efforts to address national priorities related to the management of POPs, particularly related to PCBs, Dioxins and Furans. In this regard, ANDE, the main electrical utility in Paraguay, has identified transformers and capacitors that need immediate attention (those in critical conditions) and has developed a plan for sound management of such equipment. Part of this plan includes replacement of obsolete equipment and equipment containing PCBs.
172. The government of Paraguay promotes economic growth and welfare for its population through sound management of the national resources and improvement of access to electricity service in the country. This project is consistent with the priorities in the national agenda and related actions.

**C. DESCRIBE THE BUDGETED M & E PLAN:**

| <b>M&amp;E Activity Categories</b>                         | <b>Feeds Into</b>   | <b>Time Frame</b>                                    | <b>GEF Grant Budget (\$US)</b> | <b>Co-financing Budget (\$US)</b> | <b>Responsible Parties</b>  |
|--|---|--|--------------------------------|-----------------------------------|---|
| Measurement of GEF Tracking Tool specific indicators       | Terminal Evaluation Reports   | At project completion                                | 30,000                         | 150,000                           | <ul style="list-style-type: none"> <li>• PMU provide draft reports for PCS approval;</li> </ul> |
| Monitoring of project impact indicators (as per Log Frame) | Project management; Annual GEF PIR  | To be agreed between executing partners and UNIDO PM | 50,000                         | 250,000                           | <ul style="list-style-type: none"> <li>• PSC submits Final drafts to UNIDO's PM</li> </ul>      |
| Mid-term review and Independent terminal evaluation        | Mid-term review and Terminal Evaluation Review (TER) conducted by UNIDO EVA | Project completion                                   | 60,000                         | 350,000                           | Independent evaluator, for submission to UNIDO PM and UNIDO ODG/EVA                             |
| <b>Total indicative cost</b>                               |   |  | <b>140,000</b>                 | <b>750,000</b>                    |   |

173. Project monitoring and evaluation (M&E) will be conducted in accordance with UNIDO's established guidelines for conducting terminal evaluations of GEF-funded projects and GEF procedures. The M&E activities are defined under project component 4 and the above M&E budget. Monitoring will be based on indicators defined within the project results framework and complemented by the annual work plans. The GEF tracking tool will also be used as a monitoring and evaluation tool, and will be submitted three (beginning, midterm and end of project) times during the duration of the project.



174. UNIDO as Implementing Agency will involve the GEF Operational Focal Point, national executing counterparts and project stakeholders at all stages of the project monitoring and evaluation to ensure that the results lead to improved current and future project design and implementation.
175. A detailed schedule of project review meetings will be developed by the project management team in close consultations with the project implementation partners and stakeholders' representatives, and included in the Project Inception Report. In addition, sex-disaggregated data (Annex A) will be used to track gender equality results and assess gender impacts.
176. Daily monitoring of the project activities in the field will be done by the National Project Coordinator (NPC) and supervised by UNIDO's project manager based on the approved Annual Work Plan (in line with the CEO approval and GEF guidelines) and its indicators. The Project Team will inform UNIDO of any delays or difficulties faced during the implementation so that the appropriate support or corrective measures can be adopted in a timely and preventative, rather than in a remedial manner.
177. Project Monitoring Reporting: The national project team in conjunction with the UNIDO Project Manager will be responsible for the preparation and submission of the following reports:
- (a) Inception Report: A Project Inception Report (IR) will be prepared immediately following the Inception Workshop. It will include a detailed First Year Annual Work Plan divided into quarterly timeframes, with detailed activities and progress indicators to guide the implementation during the first year of the project. The Work Plan will include the dates of specific field visits, support missions from UNIDO and/or UNIDO consultants, as well as timeframes for meetings of the project's decision-making structures. The report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, including any monitoring or evaluation requirement to effectively measure project performance during the targeted 12-month timeframe. When finalized, the report will be circulated to project counterparts, who will be given a period of one calendar month to respond with their comments or queries. Prior to IR circulation, UNIDO will review the document.
- (b) Project Implementation Review: The Project Implementation Review (PIR) is an annual monitoring process mandated by the GEF. It is an essential management and monitoring tool for those responsible of the project and offers the main vehicle for extracting lessons from ongoing projects.
178. Mid-term review: A mid-term review will be performed by an independent consultant(s). The evaluation will assess progress made towards achievement of project objectives and outcomes, and will propose project amendments, if needed. The evaluation will focus on project performance in terms of relevance, effectiveness, efficiency and timely implementation. Findings of this evaluation will be incorporated as recommendations for further project implementation during the second half of project duration. The TORs for this evaluation will be prepared by UNIDO based on the generic TORs developed by the UNIDO Evaluation Office.
179. Independent Evaluation: The project will be subject to a mid-term review and a final terminal evaluation: An independent Final Evaluation will take place within 6 months after the completion of project implementation. The final evaluation will also review impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by UNIDO in accordance with the TORs developed by the UNIDO Evaluation Office.
180. Legal clause for Paraguay: "The Government of the Republic of Paraguay agrees to apply to the present project, mutatis mutandis, the provisions of the Standard Basic Assistance Agreement between the United

Nations Development Programme and the Government, signed on 7 October 1977 and entered into force on 29 June 1978.”

**PART III: CERTIFICATION BY GEF PARTNER AGENCY(IES)**

**A. 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 CEO endorsement under GEF-6.**

| <b>Agency Coordinator, Agency Name</b>  | <b>Signature</b>  | <b>Date (MM/dd/yyyy)</b> | <b>Project Contact Person</b>   | <b>Telephone</b>     | <b>Email Address</b> |
|---|---|--------------------------|---|----------------------|----------------------|
| Philippe R. Scholtès,<br><br>Managing Director,<br><br>Programme Development and<br><br>Technical Cooperation (PTC),<br><br>UNIDO GEF Focal Point |  | 01/30/2018               | Mr. Alfredo Cueva<br><br> | (43-1)<br>26026-5228 | a.cueva@unido.org    |

<sup>10</sup> GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, SCCF and CBIT  
GEF6 CEO Endorsement /Approval Template-August2016

**ANNEX A: PROJECT RESULTS FRAMEWORK** (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

| Interventions  | Indicators   | Baseline   | Target  | Sources of Verification  | Assumptions  |
|--|--|--|---|--------------------------|--|
| <b>Project Objective</b>   | <b>To protect human health and the environment through environmentally sound management and final disposal of PCB-containing equipment and wastes, in Paraguay</b> |  |   |                          |  |
| Outcome 1.1: National PCB policy improved, capacity built and knowledge and awareness increased  |  |  |   |                          |  |
| Indicator # of environment policies, strategies, laws, regulation related to PCBs approved/enacted   |  |  |   |                          |  |
| Output 1.1.1.<br>National PCB regulations are in line with international standards   | # of national PCB regulation upgraded and approved   | Two PCB management regulations have been drafted and approved but are not being implemented by environmental authority. The institution needs to have compliance control capacity enhanced | The PCB policy and corresponding regulations are upgraded                                   | Official gazette         | SEAM is committed to build institutional capacity to enforce compliance of the regulations |
| Output 1.1.2.<br>National PCB management centre established to support PCBs owners to properly manage and dispose of PCBs and related wastes | # of companies implementing ESM plan for their PCB contaminated inventories  | The SEAM has a small chemical management department that is not able to support PCB owners with guidelines, disposal alternatives, best management practices leading to final disposal     | # SEAM has technical knowledge to support the electricity centre with ESM of PCB management | Official meeting minutes |  |



|  |  |  |  |  |
|--|--|--|--|--|
| <p>Output 1.1.3.</p> <p>National data system set and reliable analytical services strengthened to fully support inventory development and management of PCBs and related wastes, in line with international standards and best practices</p> | <p>PCB database linked to univocal code in PCB labels</p>  | <p>There is no national data system on PCBs nor an accredited laboratory for PCBs analysis</p>   | <p>1 PCB national database up and running</p>  | <p>Official documentation</p>  |
| <p>Output 1.1.4.</p> <p>Hazmat and risk management trainings conducted and awareness raised to reduced exposure of workers and the general public to PCB and related toxic wastes</p>  | <p># of people trained (male/ female)</p> <p># specific training related to gender issues (male/ female)</p> | <p>Hazmat or risk management trainings have not been conducted</p> <p>Awareness raising about PCBs and related health impacts, including specific gender issues, have not been conducted</p> | <p># At least 50 people trained on Hazmat (40% women, 60% men)</p> <p># At least one specific training to address gender concern along the PCB management cycle</p> <p># At least 50 participants (80 % women/ 20 % men) at the specific gender training</p> | <p>Meeting minutes</p> <p>Participants list of Hazmat training (male/ female)</p> <p>Participant list of gender-specific training (male/ female)</p> |

|  |   |  |   |  |  |
|--|---|--|---|--|--|
| <b>Outcome 1.2.</b>  | National PCB management plans ready for an smooth ESM and disposal of PCB-containing equipment and wastes |  |   |  |  |
|  | Indicator # National inventory and ESM of PCB management ready for final PCB elimination                  |  |   |  |  |
| Output 1.2.1.<br><br>Inventory of at least 10,000 PCB-containing equipment units and PCB wastes carried out, including sampling in oil and soils and with sound analytical methodologies | # No. of transformers properly labeled and tested   | Preliminary PCB inventory carried out during the NIP (2007) identified around 500 PCB-containing pieces of equipment in use were inventoried, from which 95.2% corresponds to electrical capacitors; 3.4% corresponds to transformers and reactors; and 1.4% to distribution transformers. Out of these 438 pieces of equipment, 421 were identified (not tested) as containing PCB and 17 as suspected. | # Sampling and analysis of at least 10,000 transformers                     | - Certificate of analysis for 10,000 transformers, including screening and GC analysis for 1500 samples  | With the commitment of ANDE, the main stakeholder from the electricity sector, the completion of the national sampling and analysis can be completed |
| Output 1.2.2.<br><br>ESM and disposal plan for PCBs developed, including cost-effective disposal options   | # No. of PCB stakeholders with PCB management plans integrated into the national PCB management plan      | - PCB equipment are not currently managed in compliance with Stockholm Convention<br><br>- A long term ESM and disposal national plan for PCB is missing   | # A functional and long-term system for the ESM management of PCB developed | National plan for the ESM and disposal of PCBs/PCB-contaminated equipment's for at least 1 stakeholder (please note that ANDE owns more than 90% of the PCB equipment) | Stakeholders are trained and committed to draft an effective ESM management and disposal plan for PCBs   |
| Output 1.2.3.<br><br>Assessment of PCB/u-POPs pollution due to fire on ANDE PCB-storage facilities   | # Assessment of the PCB/u-POPs pollution  | - On 14-10-2015 a fire occurred in the transformer deposit of ANDE, in San Lorenzo municipality. Approximately 20,000 phased out distribution transformers, potentially containing-PCBs, were stored there.  | Assessment of the PCB storage place at the San Lorenzo site finalized       | Copy of assessment report  | ANDE and SEAM is committed to assess the potential PCB/u-POPs sites to provide a baseline for future mitigation actions                              |

| <b>Outcome 1.3</b>   |   | <b>ESM and disposal of PCB-containing equipment and wastes</b>   |  |   |   |
|--|---|--|--|---|---|
| Indicator: Quantity of PCB contaminated equipment, oils and waste eliminated (metric tonnes)                             |   |  |  |   |   |
| Output 1.3.1.<br><br>Current PCB interim storage facilities upgraded and operational                                     | # Number of interim storage facilities upgraded   | - Currently the some PCB storage facilities are not upgraded to meet environmentally sound criteria  | - At least one temporary storage facility upgraded for the storage, packaging and transportation of PCBs   | Technical report available  | ANDE is committed to support the upgrade of the storage facility                      |
| Output 1.3.2.<br><br>At least 700 metric tonnes of PCB-containing equipment and waste disposed of and/ or decontaminated | # Quantity of PCB contaminated equipment, oils and waste eliminated (metric tonnes)<br><br># Quantity of PCB contaminated equipment, oils and waste safeguarded (metric tonnes)<br><br># Number of jobs created (male/ female)<br><br># Materials recycled (tonnes)<br><br># Commercial value of materials recycled (USD) | - PCB-containing equipment is stored, but not properly disposed of.<br><br>- ANDE is the main electricity holder in Paraguay with staff working in the field, however, there is a lack of application of environmental concepts<br><br>Some transformers scraps are recycled, however, equipment need to be checked for cross-contamination monitoring | # 700 tonnes of PCB-containing transformers identified, removed, packed, exported and eliminated in an environmentally sound manner and according to the Chemicals and Waste Conventions<br><br># 5 staff concerned with environmental concepts working in the electricity field (40% women and 60% men)<br><br>At least | - Certificate of disposal /treatment of PCB contaminated material<br><br>- Signed contracts<br><br>Copy of economic reports | - PCB owners are committed to environmentally sound management of their PCB equipment |

**ANNEX B: RESPONSES TO PROJECT REVIEWS** (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

| Comments   | Response   | Reference in documents   |
|--|--|--|
| <b>Comments from the GEF Council</b>   |  |  |
| <p>Germany's Comments:</p> <p>The proposal is mostly well-elaborated and refers to national priorities as set out by the NIP elaboration. Including the Laurely site, the project also tackles a need of very urgent action (immediate reduction of contamination risks). At the same time, implementation does not focus only on "cleaning up", but also on preventive and long-term measures. The envisaged Monitoring and Evaluation system is described in detail, ensuring continuous review and possibilities for adaption. The cooperation with Alter Vida, a national NGO, is highly welcome, as well as suggestion of a National PCB Management Center as a center of national technical expertise. Moreover, the consideration of gender aspects has been made in a very positive and constructive way, not only focusing on the higher risk exposure of women and children (as often done).</p> <p>Suggestions for improvement to be made during the drafting of the final project proposal:</p> <ul style="list-style-type: none"> <li>• Component 1 consists of a variety of activities and outcomes, including capacity development, law enforcement, awareness raising and equipment needs. The bundling of work packages and outputs should be reconsidered in order to gain more clarity and coherence.</li> <li>• The line between the activities of the proposed GEF-project and those conducted by means of the IADB loan for remediation of the Laurely site should be described in more detail.</li> </ul> | <p>During the PPG phase an extensive analysis of the proposed activities was made and, after consultation with SEAM and ANDE, the activities and outcomes remain as initially stated. Nonetheless, they were further designed and specified. This way, the project Component 1 has clearer Technical Assistance and clearer Investment aspects.</p> <p>During the PPG, IADB and SEAM have concluded their consultations and the IADB loan will be used for the final export and disposal of 100 tonnes of PCBs. This project will coordinate its activities with the lessons learned from the disposal activities carried out under the IADB loan.</p> | <p>Table B and PART II , Section A.1. (Project Description), Subsection 3), paragraphs 90 to 118</p> <p>Para 4 b1,</p> |
| <b>Comments from the GEF Secretariat at Work Plan Inclusion</b>  |  |  |
| No remaining comments (after final approval)   |  |  |
| <b>Comments from STAP</b>  |  |  |
| <p>The STAP commends the agency on a clear, well written proposal, with a well-articulated problem and solution space. There is good attention paid to evidence/science-based Convention guidance, and clear links to other related regional initiatives, whether led by the agency, GEF or by other stakeholders. Related to this, the stakeholder mapping</p>  |  |  |

|   |  |  |
|---|--|--|
| <p>is particularly thorough, recognizing even regional level stakeholders to promote interagency collaboration. Monitoring and Knowledge elements are well considered with clear forethought of leaving the tools and knowledge to support post project sustainability. The Risk and risk mitigation exercise was also particularly well undertaken.</p> <p>While the intent to complete inventory exercise is made clear, STAP does question how the GEBs were estimated at “up to 700 t PCBs” in the absence of completed inventories. The inventory phase should be successful of the planned activities. The STAP trusts that the GEB calculation will be clarified in the course of the extensive PPG planned for this project..</p> | <p>Originally, the project aimed to dispose 500 tonnes of PCBs which were partly inventoried by ANDE and partly estimated through the NIP. However, after the fire in October 2015 the amount was increased to 700 tonnes of PCBs based on the emergency technical report (Annex G).</p> | <p>Please see paragraphs 1-5: PART II , Section A. (Describe any changes in alignment with the project design with the original PIF), and Annex G.</p> |
|---|--|--|

**ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS<sup>11</sup>**

A. Provide detailed funding amount of the PPG activities financing status in the table below:

| <b>PPG Grant Approved at PIF: 250 000 USD</b>            |   |                                   |                                 |
|--|---|-----------------------------------|---------------------------------|
| <b><i>Project Preparation Activities Implemented</i></b> | <b><i>GETF/LDCF/SCCF/CBIT Amount (\$)</i></b> |                                   |                                 |
|  | <b><i>Budgeted Amount</i></b>                 | <b><i>Amount Spent Todate</i></b> | <b><i>Amount Committed*</i></b> |
| International technical consultants                      | 85,000  | 56,435.90                         |                                 |
| Travel   | 14,000  | 19,660.18                         |                                 |
| National consultants                                     | 20,000  | 33,575.98                         | 5,000.00                        |
| Sub-contracts (UNITAR)                                   | 87,000  | 88,355.72                         |                                 |
| National workshops                                       | 9,000   | 8,548.98                          |                                 |
| Equipment  | 33,000  | 7,143.50                          | 25,846.96                       |
| Miscellaneous  | 2,000   | 1,868.68                          | 3,564.10                        |
|  |   |                                   |                                 |
| <b>Total</b>   | <b>250,000</b>                                | <b>215,588.94</b>                 | <b>34,411.06</b>                |

\*TO BE SPENT FOR HAZMAT EQUIPMENT (E.G. PERSONAL PROTECTIVE EQUIPMENT), NATIONAL CONSULTANTS POLISHING PCB INVENTORY AND TRANSLATION OF APPROVED CEO ENDORSEMENT INTO SPANISH

<sup>11</sup> If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue to undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities. Agencies should also report closing of PPG to Trustee in its Quarterly Report.

**ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used)**

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/CBIT Trust Funds or to your Agency (and/or revolving fund that will be set up)

not applicable for this project

**ANNEX E: WORKPLAN**

|       | DURATION OF PROJECT   |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
|-------|---|------------------|-----|-----|-----|-----|-----|-----|----|----|-----|-----|----|----|----|----|----|----|-----|-----|-----|
|       | Activities  | PROJECT Quarters |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
|       | Year  | 1                |     |     |     | 2   |     |     |    | 3  |     |     |    | 4  |    |    |    | 5  |     |     |     |
|       | Outcomes and Outputs  | Q1               | Q 2 | Q 3 | Q 4 | Q 1 | Q 2 | Q 3 | Q4 | Q1 | Q 2 | Q 3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q 2 | Q 3 | Q 4 |
| 1.1   | <b>National PCB policy improved, capacity built and knowledge and awareness increased</b>   |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
| 1.1.1 | National PCB regulations are in line with international standards   |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
| 1.1.2 | National PCB management Centre established to support PCB owners to properly manage and dispose of PCBs and related wastes  |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
| 1.1.3 | National data system set and analytical services strengthened to fully support inventory and management of PCBs and related wastes, in line with international standards and best practices |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
| 1.1.4 | Hazmat and risk management trainings conducted and awareness raised to reduce exposure to workers and the general public to PCB and   |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |



|       | DURATION OF PROJECT   |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
|-------|---|------------------|-----|-----|-----|-----|-----|-----|----|----|-----|-----|----|----|----|----|----|----|-----|-----|-----|
|       | Activities  | PROJECT Quarters |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
|       | Year  | 1                |     |     |     | 2   |     |     |    | 3  |     |     |    | 4  |    |    |    | 5  |     |     |     |
|       | Outcomes and Outputs  | Q1               | Q 2 | Q 3 | Q 4 | Q 1 | Q 2 | Q 3 | Q4 | Q1 | Q 2 | Q 3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q 2 | Q 3 | Q 4 |
|       | related toxic wastes  |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
| 1.2   | <b>National PCB management plans ready for a smooth ESM and disposal of PCB-containing equipment and wastes</b>   |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
| 1.2.1 | Inventory of at least 10,000 PCB-containing equipment units and PCB wastes carried out, including sampling in oil and soils and with sound analytical methodologies |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
| 1.2.2 | ESM and disposal plan for PCBs developed, including cost-effective disposal options   |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
| 1.2.3 | Assessment of PCB/u-POPs pollution due to fire on ANDE PCB-storage facilities   |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |
| 1.3.  | <b>ESM and disposal of PCB-containing equipment and wastes</b>  |                  |     |     |     |     |     |     |    |    |     |     |    |    |    |    |    |    |     |     |     |

| DURATION OF PROJECT  |                                  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|----------------------|----------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| Activities           | PROJECT Quarters                 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| Year                 | 1                                |    |    |    | 2  |    |    |    | 3  |    |    |    | 4  |    |    |    | 5  |    |    |    |  |
| Outcomes and Outputs | Q1                               | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |  |
| 1.3.1                |                                  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 1.3.2                |                                  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 2.1 and 2.2.         | <b>Monitoring and Evaluation</b> |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 2.1.1/<br>2.1.2      |                                  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 2.2.1/<br>2.2.2.     |                                  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |

**ANNEX F: GEF BUDGET**

| Component 1 - Environmentally sound management and final disposal of PCB-containing equipment, wastes and stockpiles  |  |           |               |           |                |           |               |           |                |           |               |              |                |                                 |  |
|---|--|-----------|---------------|-----------|----------------|-----------|---------------|-----------|----------------|-----------|---------------|--------------|----------------|---------------------------------|--|
| Outcome 1.1. National PCB policy improved, capacity built and knowledge and awareness increased   | Type of Expense  | Yr 1      |               | Yr 2      |                | Yr 3      |               | Yr 4      |                | Yr 5      |               | Output Total |                | Execution Modality              |  |
|   |  | w/w       | \$            | w/w       | \$             | w/w       | \$            | w/w       | \$             | w/w       | \$            | w/w          | \$             |                                 |  |
| <i>Output 1.1.1. National PCB legislation and regulations are in line with international standards</i>  | International Expertise  |           | 14,000        |           | 14,000         |           | 14,000        |           |                |           |               |              | 42,000         | UNIDO Technical Execution       |  |
|   | Local Travel   |           | 2,000         |           | 2,000          |           |               |           |                |           |               |              | 4,000          | Execution Agreement with SEAM   |  |
|   | National Expertise (recruited by UNIDO)  |           | 3,000         |           | 3,000          |           |               |           |                |           |               |              | 6,000          | UNIDO Technical Execution       |  |
|   | National expertise   | 20        | 10,000        | 20        | 10,000         |           |               |           |                |           |               |              | 20,000         | Execution Agreement with SEAM   |  |
|   | Training/Workshops   |           | 3,000         |           | 3,000          |           |               |           |                |           |               |              | 6,000          | Execution Agreement with SEAM   |  |
|   | Miscellaneous  |           | 2,000         |           |                |           |               |           |                |           |               |              | 2,000          | Execution Agreement with SEAM   |  |
|   | <b>Output sub-total</b>  | <b>20</b> | <b>34,000</b> | <b>20</b> | <b>32,000</b>  | <b>0</b>  | <b>14,000</b> | <b>0</b>  | <b>0</b>       | <b>0</b>  | <b>0</b>      | <b>0</b>     | <b>0</b>       | <b>80,000</b>                   |  |
|   | <i>Output 1.1.2. National PCB management unit within Chemical management Centre established to support PCBs owners to properly manage and dispose of PCBs and related wastes</i> |           |               |           |                |           |               |           |                |           |               |              |                |                                 |  |
| <b>Output sub-total</b>   | <b>0</b>   | <b>0</b>  | <b>0</b>      | <b>0</b>  | <b>0</b>       | <b>0</b>  | <b>0</b>      | <b>0</b>  | <b>0</b>       | <b>0</b>  | <b>0</b>      | <b>0</b>     | <b>0</b>       |                                 |  |
| <i>Output 1.1.3. National data system set and reliable analytical services strengthened to fully support inventory development and management of PCBs and related wastes, in line with international standards and best practices</i> | International Expertise  |           |               |           |                |           | 14,000        |           | 14,000         |           | 14,000        |              | 42,000         | UNIDO Technical Execution       |  |
|   | National Expertise (recruited by UNIDO)  |           |               |           |                |           | 3,000         |           | 3,000          |           | 3,000         |              | 9,000          | UNIDO Technical Execution       |  |
|   | National Expertise   |           |               |           |                | 20        | 10,000        | 20        | 10,000         | 20        | 10,000        |              | 30,000         | Execution Agreement with SEAM   |  |
|   | Training/Workshops   |           |               |           |                |           | 3,000         |           |                |           |               |              | 3,000          | Execution Agreement with SEAM   |  |
|   | Miscellaneous  |           |               |           |                |           | 2,000         |           |                |           |               |              | 2,000          | Execution Agreement with SEAM   |  |
|   | <b>Output sub-total</b>  | <b>0</b>  | <b>0</b>      | <b>0</b>  | <b>0</b>       | <b>20</b> | <b>32,000</b> | <b>20</b> | <b>27,000</b>  | <b>20</b> | <b>27,000</b> | <b>0</b>     | <b>86,000</b>  |                                 |  |
| <i>Output 1.1.4. Hazmat and risk management trainings conducted and awareness raised to reduced exposure of workers and the general public to PCB and related toxic wastes</i>  | Training/Workshops   |           | 50,000        |           | 75,000         |           |               |           | 75,000         |           |               | 0            | 200,000        | EA with UNITAR +Hazmat training |  |
|   | <b>Output sub-total</b>  | <b>0</b>  | <b>50,000</b> | <b>0</b>  | <b>75,000</b>  | <b>0</b>  | <b>0</b>      | <b>0</b>  | <b>75,000</b>  | <b>0</b>  | <b>0</b>      | <b>0</b>     | <b>200,000</b> |                                 |  |
|   | <b>TOTAL Outcome 1</b>   | <b>20</b> | <b>84,000</b> | <b>20</b> | <b>107,000</b> | <b>20</b> | <b>46,000</b> | <b>20</b> | <b>102,000</b> | <b>20</b> | <b>27,000</b> | <b>0</b>     | <b>366,000</b> |                                 |  |

|  |                          | GEF Grant Budget Component 2 |         |         |        |        |        |        |        |        |    |              |                    |                                   |
|--|--------------------------|------------------------------|---------|---------|--------|--------|--------|--------|--------|--------|----|--------------|--------------------|-----------------------------------|
| Outcome 1.2 - National PCB management plans ready for an smooth ESM and disposal of PCB-containing equipment and wastes  | Type of Expense          | Yr 1                         |         | Yr 2    |        | Yr 3   |        | Yr 4   |        | Yr 5   |    | Output Total | Execution Modality |                                   |
|  |                          | w/w                          | \$      | w/w     | \$     | w/w    | \$     | w/w    | \$     | w/w    | \$ | w/w          | \$                 |                                   |
| <i>Output 1.2.1. Inventory of at least 10,000 PCB-containing equipment units and PCB wastes carried out, including sampling in oil and soils and with sound analytical methodologies</i> | International Expertise  |                              | 20,000  |         | 16,000 |        |        |        |        |        |    |              | 36,000             | UNIDO Technical Execution Support |
|  | Local Travel             |                              | 5,000   |         | 5,000  |        |        |        |        |        |    |              | 10,000             | Execution Agreement with SEAM     |
|  | National Expertise       |                              | 20,000  |         | 15,000 |        |        |        |        |        |    |              | 35,000             | Execution Agreement with SEAM     |
|  | Training/Workshops       |                              | 3,000   |         |        |        |        |        |        |        |    |              | 3,000              | Execution Agreement with SEAM     |
|  | Contractual arrangements |                              | 350,000 |         |        |        |        |        |        |        |    |              | 350,000            | UNIDO Technical Execution Support |
|  | Miscellaneous            |                              | 2,000   |         |        |        |        |        |        |        |    |              | 2,000              | Execution Agreement with SEAM     |
|  | <b>Output sub-total</b>  |                              | 0       | 400,000 | 0      | 36,000 | 0      | 0      | 0      | 0      | 0  | 0            | 0                  | 436,000                           |
| <i>Output 1.2.2. ESM and disposal plan for PCBs developed, including cost-effective disposal options</i>   | International Expertise  |                              |         |         |        |        | 10,000 |        | 10,000 |        |    |              | 20,000             | UNIDO Technical Execution Support |
|  | Local Travel             |                              |         |         |        |        | 5,000  |        |        |        |    |              | 5,000              | Execution Agreement with SEAM     |
|  | National Expertise       |                              |         |         |        |        | 10,000 |        | 10,000 |        |    |              | 20,000             | Execution Agreement with SEAM     |
|  | Training/Workshops       |                              |         |         |        |        | 3,000  |        | 3,000  |        |    |              | 6,000              | Execution Agreement with SEAM     |
|  | Miscellaneous            |                              |         |         |        |        | 2,000  |        |        |        |    |              | 2,000              | Execution Agreement with SEAM     |
|  | <b>Output sub-total</b>  |                              | 0       | 0       | 0      | 0      | 0      | 30,000 | 0      | 23,000 | 0  | 0            | 0                  | 53,000                            |
| <i>Output 1.2.3 Assessment of PCB/u-POPs pollution due to fire on ANDE PCB-storage facilities</i>  |                          |                              |         |         |        |        |        |        |        |        |    |              |                    |                                   |
|  | National Expertise       | 4                            | 2,000   |         |        |        |        |        |        |        |    | 4            | 2,000              | Execution Agreement with SEAM     |
|  |                          |                              |         |         |        |        |        |        |        |        |    |              |                    |                                   |
|  | <b>Output sub-total</b>  | 4                            | 2,000   | 0       | 0      | 0      | 0      | 0      | 0      | 0      | 0  | 4            | 2,000              |                                   |
| <b>TOTAL Component 2</b>   |                          | 4                            | 402,000 | 0       | 36,000 | 0      | 30,000 | 0      | 23,000 | 0      | 0  | 4            | 491,000            |                                   |

|   |                          | GEF Grant Budget Component 3 |        |      |    |        |        |       |           |       |        |              |                    |                                   |
|---|--------------------------|------------------------------|--------|------|----|--------|--------|-------|-----------|-------|--------|--------------|--------------------|-----------------------------------|
| Outcome 1.3 -ESM and disposal of PCB-containing equipment and wastes  | Type of Expense          | Yr 1                         |        | Yr 2 |    | Yr 3   |        | Yr 4  |           | Yr 5  |        | Output Total | Execution Modality |                                   |
|   |                          | w/w                          | \$     | w/w  | \$ | w/w    | \$     | w/w   | \$        | w/w   | \$     | w/w          | \$                 |                                   |
| <i>Output 1.3.1 Current PCB interim storage facilities upgraded and operational</i>                                   |                          |                              |        |      |    |        |        |       |           |       |        |              |                    |                                   |
|   | Miscellaneous            |                              | 50,000 |      |    |        |        |       |           |       |        |              | 50,000             | Contract (for admin)              |
|   | <b>Output sub-total</b>  | 0                            | 50,000 | 0    | 0  | 0      | 0      | 0     | 0         | 0     | 0      | 0            | 50,000             |                                   |
| <i>Output 1.3.2 At least 700 metric tons of PCB-containing equipment and waste disposed of and/ or decontaminated</i> | International Expertise  |                              |        |      |    |        | 20,000 |       | 10,000    |       | 10,000 |              | 40,000             | UNIDO Technical Execution Support |
|   | Local Travel             |                              |        |      |    |        | 5,000  |       | 4,000     |       | 2,000  |              | 11,000             | Execution Agreement with SEAM     |
|   | National Expertise       |                              |        |      |    | 20     | 10,000 | 20    | 10,000    | 20    | 10,000 | 60           | 30,000             | Execution Agreement with SEAM     |
|   | Training/Workshops       |                              |        |      |    |        | 3,000  |       | 3,000     |       | 3,000  |              | 9,000              | Execution Agreement with SEAM     |
|   | Contractual arrangements |                              |        |      |    |        |        |       | 2,625,000 |       |        |              | 2,625,000          | UNIDO Technical Execution Support |
|   | Miscellaneous            |                              |        |      |    |        |        | 1,000 |           | 1,000 |        | 1,000        |                    | 3,000                             |
| <b>Output sub-total</b>   |                          | 0                            | 0      | 0    | 0  | 39,000 | 39,000 | 0     | 2,653,000 | 0     | 26,000 | 60           | 2,718,000          |                                   |
| <b>TOTAL Component 3</b>  |                          | 0                            | 50,000 | 0    | 0  | 0      | 39,000 | 0     | 2,653,000 | 0     | 26,000 | 60           | 2,768,000          |                                   |

| Component 2: Project Monitoring and Evaluation |  |     |        |     |        |     |        |     |        |     |        |     |           |                                   |
|--|--|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|-----------|-----------------------------------|
| Component 4: M&E                               |  | w/w | \$     | w/w | \$     | w/w | \$     | w/w | \$     | w/w | \$     | w/w | \$        |                                   |
|  | International Expertise  |     |        |     |        |     | 40,000 |     |        |     | 60,000 |     | 100,000   | UNIDO as Implementing Agency      |
|  | Local Travel   |     | 2,000  |     | 2,000  |     | 2,000  |     | 2,000  |     | 2,000  |     | 10,000    | UNIDO as Implementing Agency      |
|  | National Expertise   |     | 2,000  |     | 2,000  |     | 0      |     | 0      |     | 5,000  |     | 9,000     | UNIDO as Implementing Agency      |
|  | Training/Workshops   |     | 3,000  |     | 3,000  | 2   | 6,000  |     | 3,000  | 2   | 6,000  |     | 21,000    | UNIDO as Implementing Agency      |
|  |  |     |        |     |        |     |        |     |        |     |        |     |           | 0                                 |
|  |  |     |        |     |        |     |        |     |        |     |        |     | 0         |                                   |
| TOTAL Component 4                              |  | 0   | 7,000  | 0   | 7,000  | 2   | 48,000 | 0   | 5,000  | 2   | 73,000 | 0   | 140,000   |                                   |
|  |  |     |        |     |        |     |        |     |        |     |        |     |           |                                   |
| Project Management Costs (PMC)                 |  | w/w | \$     | w/w | \$     | w/w | \$     | w/w | \$     | w/w | \$     | w/w | \$        |                                   |
|  |  |     |        |     |        |     |        |     |        |     |        |     |           | 0                                 |
|  | ** For a detailed list of eligible costs under PMC, please refer to the below box. |     | 37,000 |     | 37,000 |     | 37,000 |     | 37,000 |     | 37,000 |     | 185,000   | UNIDO Technical Execution Support |
|  |  |     |        |     |        |     |        |     |        |     |        |     |           | 0                                 |
|  | Miscellaneous  |     | 750    |     | 1,000  |     | 1,000  |     | 500    |     |        |     | 3,250     | Execution Agreement with SEAM     |
| TOTAL PMC                                      |  | 0   | 37,750 | 0   | 38,000 | 0   | 38,000 | 0   | 37,500 | 0   | 37,000 | 0   | 188,250   |                                   |
|  |  |     |        |     |        |     |        |     |        |     |        |     |           |                                   |
| TOTAL  |  |     |        |     |        |     |        |     |        |     |        |     | 3,953,250 |                                   |

**ANNEX G: TECHNICAL REPORT ABOUT ANDE FIRE (OCTOBER 2015)**

<http://www.eecentre.org/report-on-the-technical-support-mission-following-the-fire-at-an-electrical-station-storing-pcb-equipment-in-paraguay/>

[http://eecentre.org/Modules/EECResources/UploadFile/Attachment/Reporte\\_Paraguay\\_Final.pdf](http://eecentre.org/Modules/EECResources/UploadFile/Attachment/Reporte_Paraguay_Final.pdf)

**ANNEX H: HAZMAT: SITUATION ANALYSTS AND TRAINING RECOMMENTATIONS**

| ITEM ANALYZED  | CURRENT SITUATION   | RECOMMENDATIONS   |
|--|---|---|
| <b>DOCUMENTATION</b>                                       | There is a general undocumented action procedure, there are no specific specific action protocols, or associated records  | Design, implement and disseminate among the Fire Bodies, updated procedures, protocols and records  |
| <b>PERSONAL</b>  | Although the personnel that forms part of the units of hazardous materials is defined, as they are volunteers, their appearances can not be guaranteed. It is not known for sure how many people are part of the units.   | Strengthen the organizational structure of the units.   |
| <b>SPECIALIZED TRAINING</b>                                | There is personnel who have received training on risk levels and there are very few cases of people trained in operations and specialists level.  | Develop and training program for operations and specialists level.  |
| <b>MEASUREMENT EQUIPMENT</b>                               | Only the Volunteer Fire Department of Paraguay has a gas-meter and an explosimeter, which are however not calibrated. They also have radioactive material detection equipment. There are no records of calibration, maintenance or use of equipment. The Volunteer Fire Department of Asunción and the National Fire Board do not have any equipment or has equipment to detect radioactive material. | Provide each Fire Department with the following basic detection equipment: <ul style="list-style-type: none"> <li>• Multigas detector</li> <li>• Oximeter - Explosimeter</li> <li>• Phmetro</li> </ul>  |
| <b>PERSONAL PROTECTIVE EQUIPMENT</b>                       | There is no updated inventory of the PPE available in the unit. There is no record of use of the PPE or check of the PPE Periodic. There are no manuals or instructions for using PPE.  | At least the following basic equipment must be provided to each of the Fire Brigades: <ul style="list-style-type: none"> <li>• 4 suits level of protection A</li> <li>• 4 suits level of protection B</li> <li>• 4 suits level of protection C</li> </ul> |
| <b>TOOLS, EQUIPMENT AND SUPPORT MATERIALS AND SUPPLIES</b> | There is no updated inventory of the tools available in the units. There is no record of check of the equipment. There is no procedure for the replacement of consumables.  | Design procedure for the replacement of tools and supplies necessary for use in chemical emergencies  |

|  |  |   |
|--|--|---|
| <b>VEHICLES</b>                                | <p>Only the Volunteer Fire Department of Paraguay has a trailer that contains emergency response equipment with hazardous materials; however, there is no record of vehicle use or periodic reviews of its elements.</p> <p>The other two Fire Departments have no plans to acquire or adapt units for this type of emergency.</p> | <p>Have a procedure for the use and maintenance of the vehicle, as well as for the periodic review of the equipment it contains.</p>          |
| <b>MANAGEMENT OF DANGEROUS GENERATED WASTE</b> | <p>The three Fire Departments indicate that they leave the sites in safe conditions, arranging the waste in containers that ask to be acquired from the owner of the damaged site and leave it in their custody. There is no action protocol regarding the management of hazardous waste.</p>                                      | <p>Design and implement an appropriate protocol for managing the generation of hazardous waste</p>  |
| <b>TECHNICAL INFORMATION</b>                   | <p>They have the GRE guide of the year 2008</p>  | <p>Make arrangements to have updated technical information to use in case of chemical emergencies</p>   |
| <b>INTERINSTITUTIONAL COORDINATION</b>         | <p>There are no protocols for the inter-institutional handling of chemical emergencies</p>   | <p>Design joint action protocols with the related institutions</p>  |
| <b>REPORTS AND STATISTICS</b>                  | <p>Every emergency is reported via radio, a report is issued to the command.</p> <p>There are no periodic reports of unit statistics.</p> <p>There is no feedback from emergencies to the rest of the staff</p>  | <p>Develop a procedure for the reporting of emergencies and the design of statistics in order to provide useful data for decision makers.</p> |



## **ANNEX I: FIRE IN OCTOBER 2015: DATA GATERING**

1. On 23 October 2015 SEAM officially requested the United Nations Environment Programme (UNEP) and the Secretariat of the Basel, Rotterdam and Stockholm (BRS) Conventions for technical assistance and guidance to assess the impact of the fire event and to appropriately deal with the resulting waste. A team was assembled, and the mission took place 9 - 22 November 2015. The objective of the mission was to evaluate the extent of the environmental risk to the fire-affected sites, including the associated runoff, leaks, spills and waste, and provide recommendations for the management of the waste resulting from the incident. The objectives also included assessing the extent of human health risks at the fire-affected sites and provide guidance for reducing future risks. The evaluations and assessments by the team included interviews, aerial photography, and other assessment techniques used to evaluate the situation and develop recommendations.
2. Results estimated that fluids leaked from 8,400 transformers damaged by the fire out of a total of 20,000 transformer damaged in the site, which corresponds to one quarter of the total transformers and capacitors (in service and out of service) within the country. Paraguay does not have sufficient control mechanisms in place to avoid cross-contamination and thus is necessary to take measures to tackle the problem and avoid similar cases.
3. In this context, approximately 900 tonnes out of 3,000 tonnes of electric equipment involved in the fire are estimated to be contaminated with PCBs, roughly 700 tonnes should therefore be considered on the basis of a precautionary principle since oil is concerned, most of it already entered the environment, as a result of the fire, through the air, soil and water.
4. The report also stated several limitations in determining the levels of exposure to the environment (soil, water, air), including the remaining smoke plumes and fire that limited access to the site. Additionally, there was no access to information such as sampling, previous consultant reports, laboratory analyses, or other relevant documentation for review that would have supported a more conclusive situational analysis. Paraguay does not have the ability to process or incinerate waste containing PCBs, though it has a laboratory in ANDE that is capable of analyzing oil samples.
5. There is two private laboratories that work to establish protocols for the analysis of soil and water, one of them can analyze sample of human blood and urine. Furthermore, in Paraguay there is no established monitoring program to determine baseline levels of exposure to PCBs as part of the monitoring for health and the environment. While some blood samples were taken from firefighters who acted during the fire, the samples were not available for analysis or comparison to occupational limits. Health information should be updated for a better analysis of the exposed population, suspected cases and occupational exposure.

## **ANNEX J: GENDER ANALYSIS**

### **Country Context:**

Paraguay is a South American country located in the sub-region of the Southern Cone, along with Brazil, Argentina and Uruguay. Paraguay is part of the Mercosur mechanism (along with its full members Argentina, Brazil and Uruguay) for regional integration. Geographically, it has two distinct regions: the East (which is home to 98 per cent of the population), watered by rivers and with agricultural land, and the Chaco, an extensive plain used for livestock farming, home to the biggest environmental reserves.

Paraguay has a population of 6,780,504, out of which 41.1 per cent of the population live in rural areas. The indigenous population constitutes 2 per cent of the total population, equivalent to approximately 115,944 people divided into 19 ethnic groups and five linguistic families. Paraguay is considered a middle-income country distinguished, nonetheless, by marked socioeconomic inequalities. Firstly, in terms of human development, the country is in 111th place out of 187 countries with a Human Development Index considered average (0.676), albeit lower than the average for Latin America and the Caribbean (0.740). There are high relative levels of poverty, affecting 22.6 per cent of the population, of whom 16.2 per cent live in urban areas and 32 per cent in rural areas. Extreme poverty affects 10.5 per cent, 19.2 per cent of whom live in rural areas and 4.6 per cent in urban areas, evidencing the gap in terms of poverty between the urban and rural populations. Secondly, a Gini coefficient of 0.5102 reflects the population's unequal distribution of income.

Besides the poverty gap and rural-to city migration the gender pay gap is another source of inequality. According to UN women the integration of women in the workplace occur unequally, with markedly different rates of economic activity or effective or potential involvement in the labour market between men (87.1 per cent) and women (62.0 per cent), 25.1 percentage points lower for women. For those living in poverty, the proportion of economically active women is considerably reduced (50.9 per cent), while it remains virtually unchanged for men (86 per cent). Women's monthly incomes are equivalent to only 71.0 per cent of those of men, the majority of women working in the informal sector with highly vulnerable working conditions and no access to social security.

### Politics

Legally, women's rights were expanded through constitutional and legal changes during the 1990s. Cultural attitudes towards many areas of women's lives are also changing. Yet Paraguayan women still face many challenges in trying to attain social equality. The legal and government institutions that currently exist in Paraguay were developed in part through the efforts of feminist organizations in the country that held significant awareness-raising campaigns during the 1990s to formalize the guarantees of women's rights.

The 1992 Constitution of Paraguay upholds the principle of equality for all individuals and prohibits discrimination. However, socio-cultural practices still support discrimination against women in some areas. However, women in Paraguay have no legal restrictions on holding political office. Women have served in the government as members of the Congress (as National Deputies and as Senators), as governors, as heads of ministries, and there has been one female Supreme Court judge. They are underrepresented in comparison to male members of the government, however, and even relative to the rates of female representation in the governments of other countries of Latin America. Indeed, Paraguay has one of the lowest percentage of women in parliament in Latin America, significantly lower than neighboring Argentina and Bolivia, although higher than Brazil.

## Education

Illiteracy rates for women in Paraguay are higher than those of men, although this is a much more pronounced difference for older generations. The gender gap in education has decreased in recent years. Among youth aged 15 to 24 years, the literacy rate is 99% for both males and females. Young people of both sexes begin dropping out of the education system at significant rates following primary levels, however, and are unlikely to pursue education beyond the secondary level. As of 2010, of the population 15 and over, 92.9% of women and 94.8% of men were literate.

Women's salaries in relation to men's are the second-lowest in Latin America. This is despite the fact that women make up 74% of Paraguay's labour force.

Discrimination against women in the workplace, as well as sexual harassment on the job is common in Paraguay. The Labor Code prohibits, but does not criminalize, discrimination or harassment on the basis of sex. Complaints are generally settled privately. The Secretariat of Women's Affairs occasionally operates programs supporting women's access to employment, social security, housing, land ownership and business opportunities.

## Social Institutions

The Social Institutions and Gender Index (SIGI) measures gender-based discrimination in social norms, practices and laws across 160 countries and the score for Paraguay's was 0.058 in 2014, placing it among countries with a low level of discrimination in social institutions. It had very low levels of discrimination in physical integrity and son bias, but medium levels of discriminations in family codes and resources and assets.

## Economy (according to wikigender)

- In 2013, 59% of the female working-age population was part of the labour force, while 88% of the male working-age population was part of the labour force.
- In 2013, women represented 39.5% of the total labour force.
- In 2012, 49% of women in the labour force were in vulnerable employment compared to 40% men in the labour force.
- In 2012, 23% of women in the labour force were employed in the agriculture sector compared to 30% of men in the labour force.

## Gender mainstreaming activities

UN Women supports the Paraguayan State in the challenge to extend women's rights and to achieve gender equality and the empowerment of women. It also supports civil society initiatives, contributing mainly to strengthening women's organizations to ensure that their voices are heard with regard to equality of rights and opportunities such as the leadership and political participation of women, the economic empowerment of women, the elimination of violence against women, and the promotion of international regulatory frameworks and intergovernmental political commitments on gender equality and the empowerment of women.

## **PCB sector context within the UNIDO-GEF project**

Gender considerations will be an integral part of the project strategy in consideration of the Gender policies of GEF, UNIDO and Paraguay. This is because efforts to ensure the Sound Management of Chemicals, especially POPs, have important gender dimensions. In daily life men, women and children are exposed to different kinds of chemicals in varying concentrations. Biological factors, notably size and physiological differences between women, men, adults and children, influence susceptibility to health damage from exposure to toxic chemicals. Social factors, primarily gender-

determined occupational roles, also have an impact on the level and frequency of exposure to toxic chemicals, the types of chemicals encountered, and the resulting impacts on human health.

Regarding the situation in Paraguay, it is expected that the majority of workers employed by electricity companies and the industrial and mining sectors, maintenance companies, junkyards, large consumers and industries, among others, are men. The situation is as follows:

- **MANUFACTURING:** During the manufacturing processes of electrical equipment (transformers) the majority of women are working in the winding processes (100%), where more manual work is required. In all other processes such as boiler, painting, connection or final assembly the workers are exclusively men.
- **MAINTENANCE AND REPAIR OF EQUIPMENT:** exclusively men
- **IDENTIFICATION AND SAMPLING WORK:** field work for identification and sampling is rather mixed (50% women and 50% men)
- **LABORATORY ANALYSIS:** Laboratory analysis is carried out mainly by women (80% women and 20 % men)
- **TEMPORARY OR FINAL DISPOSITION:** During the transfer and packing of equipment the majority are also male (we could use the percentages of women in fireworkers, for example: 1 woman for every 5 men)
- **MANAGEMENT, LOGISTICS AND PLANNING:** 50% women and 50% men

In addition, there might be women and children in the communities surrounding electric maintenance facilities, who spend most of their time in potentially PCB-contaminated areas which represent high human health risks. These gender dimensions will need to be addressed present in both the project and on policy level interventions regarding the sound management of chemicals in general and of PCBs in particular.

For example, the fire at one of ANDEs PCB storage place imposed great risks to human health, which is also true for the stored PCBs and PCB-contaminated soils. Thus, the project will ensure that relevant stakeholders are aware and have adequate knowledge of environmentally sound management of PCBs and special attention is to be given to women and children working or living close to the storage places.

### **Stakeholder and Indicators**

Stakeholders (who are mainly ANDE and the Ministry of Environment) will be informed about gender mainstreaming through regular project meetings and be kept informed about gender-related activities. In line with UNIDO's gender mainstreaming policy of environmental management projects, the project will be prepared and implemented in a gender-sensitive and gender-responsive manner and will include at least the following activities:

To achieve and monitor gender mainstreaming during project implementation, efforts will be made to ensure that recruited staff either has existing knowledge on integrating a gender perspective or their capacity will be built in this area, or they will be trained. (e. g. Gender Courses on UN Women's eLearning Campus <https://trainingcentre.unwomen.org>). The work of recruited staff will also include the collection, analysis and monitoring of sex-aggregated data along the PCB-cycle. The baseline could be data collected during PPG and their in-depth assessment and monitoring.

Regarding the gender-responsive trainings, it is aimed to include an available national gender expert with technical knowledge to advice on the gender-sensitive implementation of activities such as trainings and development of training programmes and to ensure that gender issues are addressed during the implementation phase. If such person is not available a technical knowledgeable person with gender experience will be recruited.

In addition, since women and children are the most impacted from the adverse effects of PCBs, awareness raising materials specially designed to facilitate women's participation in the project will be prepared. An assessment of the impact of PCBs in women and children will be conducted as part of the awareness raising and training materials. For this purpose, gender focused group will be consulted during the preparation of gender-related activities.

General indicators will be at least the following:

- (i) workshops (measured as participation by male/female gender-specific presentations)
- (ii) trainings (measured as number of male/female, gender-specific presentations, gender-specific information material)
- (iii) gender-specific awareness-raising campaigns (e.g. targeted to women's group; gender-specific knowledge materials)
- (iv) gender-specific technical trainings. It is aimed to increase the number of women underrepresented in processes along the PCB life cycle, e.g. by targeting 40% of the staff working in the technical domain of reparation, maintenance and final disposal, if possible. However, it needs to be noted that especially these activities require heavy lifting and might not be feasible for each women.

Specific gender indicator

Output 1.1.4. "Hazmat and risk management trainings conducted and awareness raised to reduced exposure of workers and the general public to PCB and related toxic wastes"

Indicator # specific training related to gender issues (male/ female)

**ANNEX K: EXECUTION SUPPORT LETTER**



TEKOHA  
RESAJ  
SECRETARÍA  
NACIONAL DEL  
AMBIENTE



Asunción, 29 September 2017

**To: Mr. Philippe R. Scholtès**  
Managing Director  
Programme Development and  
Technical Cooperation – PTC  
UNIDO, Vienna International Centre  
Wagramer Strasse 5, P.O. Box 300  
1400 Vienna, Austria

*Subject: Requesting UNIDO to provide execution support for the project:  
“Strengthening the environmentally sound management and final disposal of PCBs,  
in Paraguay.”*

UNIDO and the Ministry of Environment of Paraguay (SEAM) have jointly developed the above referred project for submission to the Global Environment Facility (GEF), through a collaborative effort and extensive consultations with national stakeholders and potential executing partners to ensure a strong commitment of the Paraguayan public and private sectors to meet the project objectives.

Due to the nature of the project and the barriers that Paraguay faces for the environmentally-sound management and elimination of PCBs, as the country’s GEF Operational Focal Point, I hereby request UNIDO to provide execution support for this project through international procurement of equipment, services, international experts and hiring the National Project Coordinator to be based at the SEAM.

We look forward to working closely with you to submit this important project in due time and commence with its implementation once it is approved.

Yours sincerely,



Ms. Ethel Yamil ESTIGARRIBIA GONZALEZ  
Director of the National Office of Climate Change  
GEF Operational Focal Point

Copy to: Ing. For. Rolando Gabriel DE BARROS BARRETO, Ministro - Secretario Ejecutivo  
Mr. Fernando BRITZ, Director de Calidad Ambiental, Convention Focal Point for Stockholm (POPs)

**ANNEX L: ENDORSEMENT LETTER FOR NATIONAL ADMINISTRATIVE PARTNER**



TEKOHA  
RESAI  
SÁMEYHYHA  
SECRETARIA DEL  
AMBIENTE

TETÁ REKUAI  
GOBIERNO NACIONAL  
Jaispe Chopyrykopa Taky P'aryi  
Capitãtãrãndõ Juyitãrã Nãevã Rãtãrã

Asunción, 01 December 2017

**To: Mr. Philippe R. Scholtès**  
Managing Director  
Programme Development and  
Technical Cooperation – PTC  
UNIDO, Vienna International Centre  
Wagramer Strasse 5, P.O. Box 300  
1400 Vienna, Austria

*Reference: Letter of endorsement for the project: "Strengthening the environmentally sound management and final disposal of PCBs, in Paraguay."*

We are pleased to support to Non-Governmental Organization CEAMSO, as administrative partner for the project of reference.

We interviewed and compared several local and foreign organizations, considering both the technical and managerial capacities, as well as the added value that they could contribute to the project. The results of this process and the factors considered are summarized in the attached table. As you can see, CEAMSO achieved the highest score, providing the greatest added benefits in relation to the economic offer and project management.

In this regard, we would like to request UNIDO to draft the Terms of Reference in order to develop a subcontract with CEAMSO as Administrative Partner under the supervision of the Secretariat of Environment of Paraguay (SEAM).

Yours sincerely,



**Mr. Rolando Gabriel De Barros Barreto Acha**  
Minister of Environment  
Secretariat of Environment of Paraguay  
GEF Political Focal Point

Copy to: **Ms. Ethel Yamili ESTIGARRIBIA GONZALEZ**, GEF Operational Focal Point  
**Mr. Fernando BRITTEZ**, Director of Environmental Quality, Convention Focal Point for Stockholm (POPs)