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IMPLEMENTATION COMPLETION AND RESULTS REPORT
(TF-94744)

ON A
GEF GRANT
IN THE AMOUNT OF US\$ 7 MILLION
TO THE
SOCIALIST REPUBLIC OF VIETNAM
FOR A
PCB MANAGEMENT PROJECT

October 28, 2015

Environment and Natural Resources Global Practice
EAST ASIA AND PACIFIC REGION

CURRENCY EQUIVALENTS

Exchange Rate Effective June 30, 2015

Currency Unit = Vietnamese Dong (VND)
VND21,821 = US\$1

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

CPS	Country Partnership Strategy
DA	Designated Account
DONRE	Department of Natural Resources and Environment
EA	Environmental Assessment
EMP	Environmental Management Plan
EVN	Vietnam Electricity
FM	Financial Management
GA	Grant Agreement
GEF	Global Environment Facility
GEO	Global Environmental Objective
ISR	Implementation Status and Results Report
MOIT	Ministry of Industry and Trade
MONRE	Ministry of Natural Resources and Environment
MT	Metric Ton
MTR	Mid-term Review
NAP	National Action Plan
NIP	National Implementation Plan
NSC	National Steering Committee
PAD	Project Appraisal Document
PCB	Polychlorinated Byphenil
PIM	Project Implementation Manual
PMU	Project Management Unit
POPs	Persistent Organic Pollutants
QCBS	Quality- and Cost-based Selection
TOR	Terms of Reference
VEA	Vietnam Environmental Administration

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COUNTRY
Project Name

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MAP

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1. Project Context, Global Environment Objectives and Design

1.1 Context at Appraisal

The Stockholm Convention on Persistent Organic Pollutants: Persistent organic pollutants (POPs) are a class of toxic chemicals that, as their name suggests, persist in the environment for long periods of time, are able to travel long distances from their points of origin, carried by natural soil, water and air processes, and accumulate in the fatty tissue of living organisms. Exposure to POPs can lead to serious health effects, such as reproductive or development disorders, nervous system damage, and immune system diseases.

Given their toxicity, persistence and trans-boundary properties, in 2004 the global community adopted a multilateral environmental agreement to address the challenge. The Stockholm Convention on POPs¹ requires Parties to take measures to eliminate or reduce the release of POPs into the environment. At the time of project appraisal, the Stockholm Convention addressed twelve distinct POPs divided across three broad categories: pesticides, unintended by-products and industrial chemicals². The Stockholm Convention requires its parties to submit a National Implementation Plan (NIP) to the Conference of the Parties within two years after ratification of the Convention by the country. For Polychlorinated Biphenyls (PCBs) - one of the POPs - it requires all Parties to eliminate the use of PCB-containing equipment by 2025 and to make determined efforts to have liquid PCBs and equipment contaminated with PCBs subject to environmentally sound waste management as soon as possible, but no later than 2028. Before 2025, the Convention does allow all Parties to use PCBs in intact and non-leaking equipment in areas where the risk from environmental release can be minimized and quickly remedied. However, no PCB-containing equipment should be used in areas close to human food or animal feed production and processing facilities. Special measures apply for any use of PCB-containing equipment in populated areas, including near schools and hospitals.

Sector and country contexts: Vietnam signed the Stockholm Convention on May 23, 2001, ratified it on July 22, 2002, and submitted its NIP to the Stockholm Convention Secretariat in September 2007. Fifteen areas of action were identified as a priority for Vietnam in meeting its obligations. PCB management was listed in Priorities No. 5 (remediation of PCB-contaminated sites) and No. 6 (elimination of PCBs in industrial uses, in particular in electrical equipment). Vietnam has never produced PCBs but imported about 27,000 to 30,000 metric tons (MT) of PCB-containing oils from about the end of the 1940s to 1985. Significant amounts of PCBs existed in Vietnam at the time of project preparation, primarily in oils used in electrical transformers and capacitors.

Two preliminary inventories of electrical equipment containing PCBs were carried out in 2004 and 2006 under the NIP and they found an estimated 9,600 MT of PCB-containing oils in Vietnam, primarily in about 9,000 transformers and 1,800 capacitors. However, the inventory report cautioned that this was underestimation, as the surveys covered only 70% of the facilities

¹ The Stockholm Convention entered into force on May 17, 2004. For more information, visit the Convention's website at: <http://chm.pops.int/Convention/tabid/54/Default.aspx>

² PCBs are one group of compounds listed in the Stockholm Convention's initial 'dirty dozen', which also included a range of pesticides, industrial chemicals and by-products. In 2009, the Stockholm Convention amended its Annexes A, B and C to include 9 new POPs, and in 2011 was further expanded to include the insecticide endosulphan.

of Vietnam Electricity (EVN). Furthermore, it was estimated that EVN owns only about 70% of oil-containing electrical equipment in Vietnam.

1.2 Original Global Environment Objectives (GEO) and Key Indicators

The development objective of the project as set in the GEF Grant Agreement (GA) was to: (i) develop national capacity in Vietnam to manage all PCBs; and (ii) on a pilot basis in Participating Provinces safely store significant amounts of PCBs in anticipation of future disposal³.

The GEO achievement was to be measured by the following key performance indicators:

a) Risks of contamination from all inventoried PCBs are monitored by government authorities;

b) Inventoried PCBs in 9 demonstration sites are safely stored, preventing risks to human health and environment caused by PCBs; and

c) Sufficient capacity in the country will be in place by end of project to proceed to choice of a national disposal option for PCBs.

1.3 Revised GEO (as approved by original approving authority) and Key Indicators, and reasons/justification

Neither GEO nor key indicators were revised during project implementation.

1.4 Main Beneficiaries

The project's main beneficiaries included government of Vietnam, and specifically officials from the Ministry of Natural Resources and Environment (MONRE), Ministry of Industry and Trade (MOIT) and MONRE's Vietnam Environment Administration (VEA), the agencies responsible for overseeing implementation of activities to ensure that the country meets its obligations under the Stockholm Convention. The Vietnam Electricity (EVN) would benefit from activities carried out in its subsidiaries, including construction of safe PCB-containing equipment and waste storages. Pha Lai Power Company was identified as one of the pilot beneficiaries at project appraisal. The Departments of Natural Resources and Environment (DONRE) in selected provinces would benefit from increase of institutional capacity of PCB management and public awareness, as well as piloting of safe storage of PCBs. Various stakeholders involved in PCB and hazardous waste management in Vietnam, including customs officers, laboratory technicians of DONREs, power companies, electrical equipment manufacturers and service workshops, hazardous waste management facilities, and oil/equipment recyclers, hazardous waste transporters, hazardous waste disposal facilities, the Ministry of Labor, Invalids and Social Affairs and mass media would benefit from specifically targeted training and public awareness activities. Finally, public at large would benefit from improved knowledge on the health and environmental impacts of PCBs and potentially reduced health risk due to improved PCB management infrastructure.

³ The PAD version of the GEO was the same as in GA, except for clearly separating the two objectives (i.e., 'Develop national capacity in Vietnam to manage all PCBs and on a pilot basis in selected provinces safely store significant amounts of PCBs in anticipation of future disposal')

1.5 Original Components

The project objectives were to be achieved by the following activities grouped in the components:

Component 1: PCB management framework and action plan (total cost: USD 4,163,980, of which GEF US\$ 1,989,338, other sources USD 2,174,642). This component aimed to establish a sound policy and legal framework for every aspect of management of PCBs. It would assist Vietnam to develop technical and administrative guidelines with clear procedures defining roles and responsibilities of concerned government agencies and industry. In addition, this component was to carry out the third national PCB inventory investigation based on actual sampling and laboratory analysis of suspected electrical oils to devise a realistic national PCB management action plan.

Component 2: PCB management demonstration (total cost: USD 4,977,600, of which GEF USD 2,097,600, other sources USD 2,880,000). The objectives of this component were to demonstrate sound PCB management activities at 15 demonstration facilities (works investments, for physical storage of PCBs would be financed by the project only at 9 sites) and to replicate experience at these facilities to others within the selected provinces where these demonstration facilities are located. This demonstration would cover activities, such as identification of stored PCBs and their temporary safe storage. The project would not include any site remediation activities. Among the 15 demonstration facilities selected, only the Pha Lai Power Company (a subsidiary of EVN) had confirmed its participation in the project at appraisal.

Component 3: Institutional strengthening (total cost: USD 3,787,300, of which GEF USD 1,759,822, other sources USD 2,027,478). This component would support: (i) capacity building for stakeholders involved in PCB management activities; and (ii) public awareness campaigns to mobilize public support for sound PCB management.

Component 4: Monitoring and evaluation (total cost: USD 2,274,700, of which GEF USD 392,500, other sources USD 1,882,200). This component would support activities to monitor progress of project implementation and to evaluate effectiveness of project activities. Monitoring and evaluation results were to be used by stakeholders to identify actions needed to strengthen the effectiveness of the project during project implementation. Monitoring tools developed under the project were expected to be institutionalized for the management of all PCBs in Vietnam.

Component 5: Project management (total cost: USD 1,744,400, of which GEF USD 699,400, other sources USD 1,045,000). This component would finance costs related to establishment of two Project Management Units (PMUs) and incremental operating costs of the PMUs. One PMU would support project management activities to be carried out by the Ministry of Natural Resources and Environment (MONRE) and the Ministry of Industry and Trade (MOIT), and another would support activities to be carried out by EVN.

1.6 Revised Components

There were no significant revisions in the scope of components, although in December 2014 it became evident that given the circumstances outside of the project influence (changes in land use plan and local population objections) the project would accomplish construction of seven demonstration facilities instead of nine. The decrease of number of demonstration facilities

however did not significantly contribute to demonstration effect that the project was to achieve. Hence, and in the absence of the government's request to formally restructure this target, it was not changed in the Results Framework. The savings resulting from this decision were reallocated to carry out testing and analysis of additional PCB samples and purchase of laboratory equipment. In the course of the project, few additional technical guidelines, as described in Annexes 2 and 7, were developed, as their necessity was identified during project implementation after more sector information was collected.

1.7 Other significant changes

The project was restructured once, on December 16, 2014 to extend the closing date by six months, from December 31, 2014 to June 30, 2015. This would allow completion of the national PCB inventory, which was both significant activity in terms of disbursements and also contribute significantly to the sustainability of project's outcomes. The extension would also allow to complete Component 2, PCB Management Demonstration, activities, particularly the storage facilities, construction of which was delayed both due to delay in PCB inventory activity as well as finding proper locations acceptable by local residents.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

Overall, the design of project components is considered to have been sound. The project's aims and structure were appropriately responsive to Vietnam's interest in addressing the policy, regulatory and information challenges of PCB management so as to meet Stockholm Convention requirements. While lessons of other countries tackling PCB phase-out were diligently studied and considered, the project design was also based on a pragmatic decisions taking into account the unique and complex country situation.

Project background analysis that informed design: The background analysis that informed project preparation was comprehensive and commensurate with the complexity of the issue to be addressed. The project benefitted and was directly informed by the NIP preparation process, which took place in parallel with project preparation. Specifically, the project benefitted from: (i) initial national inventory and assessment of PCB usage; (ii) assessment of national infrastructure for POPs analysis and monitoring; and (iii) assessment of the existing institutional, policy and regulatory framework for POPs management in Vietnam. Further detailed studies were carried out using USD 350,000 project preparation grant (GEF PDF-B grant) and USD 250,000 Canadian POPs trust fund. Project preparation identified and confirmed the key issues that required to be addressed most urgently, namely: (i) incomplete PCB inventory; (ii) poor practice of storage of retired electrical equipment and PCB oils that are prone to create cross-contamination; (iii) no or ambiguous policies or regulations targeting PCBs that allowed mixing and cross-contamination of PCB oils, recycling and reuse of PCBs and ultimately release into the environment; (iv) lack of guidelines for clean-up of contaminated sites, storage and transportation of PCB waste; and (v) limited professional capacity for PCB management in line ministries and industrial sectors.

Given the limited initial GEF and counterpart budget available for this first project aiming to address PCB phase-out in the country, after thorough considerations, it was decided that the crucially important PCB disposal capacity development would be addressed by a follow-up project. The decision was pragmatic and based on consideration that disposal capacity development requires a rational planning and needs to be based on accurate and complete PCB

inventory data. The lesson from cases in developed countries that POPs specialized disposal facilities were closed due to reduced volume of wastes and uncompetitive economic performance was fully taken into account.

Government commitment and support for design: On the national level, the project would support implementation of the NIP, Vietnam's National Strategy for Environmental Protection and the Five Year Plan 2006-2010 of the MONRE. It would contribute to Vietnam's efforts to reduce the risks to human health and ecosystem integrity from industrial pollution and improve its capacity and performance in hazardous waste management. The government, through MONRE, MOIT and provincial governments, provided adequate financing to carry out preparation activities, and set up an institutional structure via inter-ministerial Project Steering Committee to oversee project implementation. The government had also established the National Steering Committee (NSC) consisting of high level ministry officials for the implementation of the Stockholm Convention, which oversaw preparation of NIP and would provide overall project implementation guidance. While the government was ready to fully support project preparation and implementation through its institutional setups, it also stood ready to provide adequate co-financing during implementation. In the midst of project preparation in December 2006 when the GEF came up with the provision that GEF Operational Program on POPs will only provide grant to finance the agreed incremental costs, MONRE assured that given the priority status of the project they will provide matching counterpart funding.

Possible critical project risks and risk mitigation measures were overall, adequately identified, however potential impacts of a few were somewhat underestimated. The overall risk was rated as Moderate, given the moderate rating for most of the underlying risks. While fiduciary risks were adequately identified, the implementation capacity, rated Moderate at appraisal, appeared to be a significant cause of project implementation delays, particularly in relation to carrying out procurement of complex contracts. Similarly, while the team identified a risk of poor coordination among MOIT, VEA and EVN as Moderate, poor coordination, particularly at the beginning of the project (e.g., reaching agreement between VEA and EVN on PCB inventory methodology) appeared to be a major bottleneck. Finally, PAD correctly identified delay in preparing the follow-up project addressing disposal options as a risk with a residual rating after mitigation Low. While the follow-up project is likely, the timeframe and scope of it are yet unknown.

2.2 Implementation

Project implementation period: Project effectiveness was delayed due to delay in finalization of the Project Implementation Manual (PIM) and establishing PMUs at VEA and EVN. While project implementation started nine months after it was approved by the Board, its closing date was extended only once - by six month. Beyond this project extension there were no other restructurings.

Project at risk status: While for most of the project duration the project implementation progress and progress towards achievement of GEO were assessed as Moderately Satisfactory, its implementation progress rating was downgraded to Moderately Unsatisfactory first in May 2012 due to delays in hiring consultants for the key contracts – PCB inventories at EVN and non-EVN facilities. This affected both start of implementing other activities as well as disbursement rate, which at mid-term review (MTR) reached only 22% for VEA activities and 1.54% for EVN. No restructuring of the project was proposed during MTR, as at the time the newly agreed implementation schedule would still allow the project fully achieve its objectives before the original closing date. The project was upgraded back to Moderately Satisfactory in December

2012 when the two inventory contracts were signed. Implementation of inventory work however continued to experience hurdles and the projects ratings were again downgraded in December 2014, as it was evident that neither inventory nor the next larger contract, storage construction can be completed within project period. The ratings were reversed back to MS in the last Implementation Status and Results Report (ISR) in June 2015 given the progress with implementation of the two contracts and the rest of activities.

PCB inventory of EVN and non-EVN enterprises was one of the key project activities in terms of its volume and also crucial as a background information to initiate other activities, such as preparation of the National PCB Action Plan, selection of storage sites in pilot provinces and preparation of the individual PCB management plans. The inventory results were also to be key for decision making on the preferred PCB disposal option to be addressed by a follow-up project. There were numerous factors that affected poor implementation of the contracts, among them: (i) poor coordination between VEA and EVN resulting in difficulties to reach an agreement on the methodology to be used in both inventories; (ii) lack of experience of PMU procurement staff/procurement unit in carrying out more complex consultant selection (quality- and cost-based selection, QCBS), which resulted in delays of finalization of the terms of reference (TORs) and evaluation of technical proposals; (iii) lack of experience in PCB (and POPs in general) area and Bank procurement process by local consultancy market; (iv) changes of key technical staff in selected contractor teams, particularly at the start of contract implementation; and (v) difficulties in carrying out sampling due to non-cooperation of some facilities and timing for sampling that had to be coordinated with power cut schedules. This all resulted in both delay of implementation and at times substandard outputs. While VEA/MOIT's part of inventory with the persistence of the VEA's PMU and support of the Bank's task team was successfully completed, EVN was not able to fully complete the inventory until the very end of the project.

Storage demonstrations: The PCB inventory results were to feed in site selection for PCB storage demonstrations that would be closest to the major PCB equipment retiring facilities. With inventory delays, process of storage construction stalled, however at MTR the Bank team and the client agreed that it will start process using the limited existing data. This was a pragmatic decision. While non-ENV sites were easier to determine given that most would be located in the territories of existing larger PCB equipment producing, waste management and oil recycling facilities, site selection appeared to be more complex in EVN subsidiaries/small PCB equipment servicing workshops, which at times were located nearby or in the middle of highly populated areas. As such, construction of hazardous material storages either faced local population objections, or were objected by the local governments given their land use masterplans. As a result, EVN was able to only construct one new PCB safe storage facility, while it has also upgraded several of its storages using own financing sources.

While these two important contracts affected other decisions, including those related to the National PCB Action Plan completion, nevertheless good progress was achieved and the plan was completed. Also, other activities such as MIS, training, capacity building and shaping of regulatory framework, successfully completed, were all essential to achieve project results, and ensure sustainability of project outcomes.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

Design: The project design included a sound project monitoring and results framework with three PDO (outcome) level indicators and eleven intermediate outcome (results by component) indicators covering most aspects of the GEO and components. While most of the indicators were well defined, some of them would have benefitted from being more specific (see sub-section on

Implementation below). Also, annual progress targets were, as usual in GEF operations designed at the time, translated as a percentage of achievement of the total, which did not allow for an accurate assessment of the progress and could lead to misinterpretation. The project supported a Management Information System (MIS) establishment, which was to be central to project management and monitoring and track progress towards project implementation milestones and achievements. The MIS was to be an important tool to also house the national inventory data.

Implementation: Results framework indicators were used to measure project progress throughout implementation in the semi-annual PMU progress reports and Bank's Implementation Status and Results Reports (ISRs). As mentioned above, some outcome indicators were not defined in a straightforward manner and assessment of their achievement could depend on the interpretation. For example, the outcome indicator 'sufficient capacity in the country will be in place to proceed to choice of a national disposal option for PCBs (% referring to a qualitative assessment of capacity)'- While this would have been an appropriate indicator in the absence of implementation delays, in reality it appeared to be difficult to measure given that disposal option decision was largely dependent on the results of the national inventory, which was completed only at the closure of the project. On the other hand, capacity building activities were fully implemented and clearly there was now capacity and basis in the country to make such decisions. **The MIS, while already designed at the preparation, was not consistently used to track project progress towards its Results Framework indicators.** It was however gradually expanded to accommodate inputs of the national PCB inventory, which in fact was the key utility of the MIS.

Utilization: MIS was upgraded and as of April 2012 allowed the start of entering national inventory data as well as linking to the GIS system of VEA. By the end of project, all inventory data of VEA have been transferred to MIS, and EVN was working on data input.

2.4 Safeguard and Fiduciary Compliance

Safeguard compliance: During preparation, it was determined that the project triggers OP4.01 Environmental Assessment and is classified as Category B. Project's potential adverse environmental impacts were assessed as not substantial and easily managed and mitigated. The project was expected to improve the management system of PCB oils and equipment throughout their life cycle, which would result in lowering risks to humans and environment. At the earlier stages of preparation the project was classified as a Category A project, but the category was lowered to B because of the decision not to finance the PCB disposal facilities' construction. An Environmental Assessment Framework (the EA Framework) was prepared based on two rounds of stakeholder consultations. Based on the EA Framework, an environmental assessment (EA) report was prepared for the Pha Lai Thermal Power Generation Company – the only identified and confirmed facility before appraisal.

The safeguards reviews conducted during implementation confirmed consistent compliance with OP 4.01 safeguard policy. The Environmental Management Plans (EMPs) of the storage site constructions were reviewed and accepted by the Bank, adopted by the local governments and complied with during construction period. The draft EMPs were discussed during public consultations (as a result of due public consultation process, decisions to halt moving forward with construction of several EVN storages were made). In addition, site-specific PCB management plans were developed under project to monitor proper management of PCB at five EVN facilities without the introduction of construction work.

The overall safeguard implementation of the project is assessed as *Satisfactory*.

Financial Management: Financial management throughout the project was generally *Satisfactory*. The two PMUs had adequate financial management arrangements for project implementation. In March 2011, due to implementation delays on EVN part, the agreement was reached to return EVN's advance of its designated account (DA). However, the first expenditures took place and were documented in July 2011, therefore DA advance was not returned. The audited financial statements were delivered on time and the auditors have issued an unqualified audit opinions. The project management recommendation letters issued by the auditors did not contain any internal controls deficiencies or accounting issues. The quarterly Interim Unaudited Financial Reports were submitted on time with acceptable quality. While there were a few internal control and contract management issues identified during the Bank implementation support missions, the PMUs have fully implemented the Bank mission recommendations.

Procurement: Generally the Bank's procurement guidelines were complied with. The project procurement experienced implementation delays in part due to inadequate procurement capacity in the PMUs, particularly in EVN, and their unfamiliarity with QCBS procedures in the beginning. The procurement rating was downgraded to Moderately Satisfactory a year after effectiveness, and further to Moderately Unsatisfactory in May 2012, mainly due to slow selection of consultants for PCB inventory of EVN and non-EVN sites. Additional capacity building, training and daily hands-on support were secured since then. The procurement approval authority has been decentralized to departmental level, instead of ministerial level. As a result, implementation of procurement activities following the Mid-term Review came back on track. In the last year of the project, the procurement rating was upgraded to Satisfactory, and all procurement activities were assessed to be performed in a professional manner, and in full compliance with the World Bank Procurement Policies/Guidelines and the procurement plans. This assessment remained effective until project closing.

2.5 Post-completion Operation/Next Phase

One of the key project's outputs was improved institutional capacity of the government agencies, EVN and the private sector in management of PCB-containing retired equipment and waste. The project produced the National PCB Action Plan that is submitted to MOIT and is expected to be formally issued shortly, while in fact its implementation is already ongoing. The objective of the plan is to ensure integrated PCB management in order to minimize PCB emission to the environment, implement use of PCB in equipment and materials phase-out by 2025, ensure safe destruction of PCB contaminated equipment, oil and waste by 2028 and remediate PCB contaminated sites. As such, the plan foresees in the period of 2015-2017 to: (i) complete legal framework related to PCB management; (ii) continue building human resources for PCB management; (iii) completing inventory of PCB-containing equipment, materials and waste, and detecting sites and sediments suspected PCB contamination; (iv) carry out a pilot scale study on PCB treatment technologies; (v) conduct studies to find out appropriate technologies, which can be applied to recovery, recycling, and treatment of PCB-containing equipment and materials as well as for remediating PCB-contaminated soils and sediments; (vi) identify alternatives for storage, collection, transportation and treatment of PCB over the country; and (vii) complete infrastructure and legal formalities for PCB collection, transportation, storage and treatment service units. As described in the below sections, many of the activities are well ongoing and their finalization is essential to design well informed future sector interventions.

A concept of the Industrial Hazardous Waste Management project that aims to implement environmentally sound management and treatment of PCBs has been developed by the Environmental Technology Center and submitted to VEA/MONRE, relevant authorities and donors in June 2015. This follow-up project would continue to support the environmental

management of toxic chemical waste in Vietnam in general and implementation of the Stockholm Convention in particular.

In parallel, the World Bank has initiated two analytical studies on solid waste and air quality management that will be completed in early CY2016. The outcome of this work will inform the design and scope of the new investment project/program and also potentially including a follow-up work on PCB phase-out.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

Rating: *Satisfactory*

The project's objectives and design were relevant to the Country Partnership Strategy (CPS) 2007-2011, and remain so under the current CPS FY 2012-2016, as well as to both Vietnam's country level and global environmental priorities. Under the key pillar of the CPS 2007-2011, which addressed strengthening of natural resource and environmental management, the project supported the aim of mitigating the environmental impacts of human activities and, more directly, the Government's desire to observe international environmental conventions by establishing a basis for phase-out of PCBs. The current CPS FY 2012-2016 explicitly maintains this focus by recognizing that Vietnam's economic growth has generated environmental risks and decline of natural habitats. Its pillar 2 on sustainability focuses on, among others, land management and pollution control. The PCB project also has remained a key project in Vietnam for the fulfillment of the country's commitment towards the Stockholm Convention. The project has laid the foundation for a national program of PCB elimination in Vietnam.

3.2 Achievement of Global Environmental Objectives

Rating: *Moderately Satisfactory*

Based on assessment of project outputs, weighed against the project's performance indicators, the project is considered to have largely achieved its GEO in spite of the delays that plagued aspects of its implementation. The project has made acknowledged improvements to the development of the national capacity to manage PCBs and piloting safe storage of PCB at participating provinces. The project contributed to strengthening the regulatory, policy, and technical framework for PCB management in Vietnam as well as raising public awareness towards safeguarding the environment and people from PCB/POPs and hazardous waste pollution. A comprehensive regulatory system addressing the full life cycle of PCBs from banning of production, import, sales, to in-service equipment management and final disposal, has been developed. The draft National PCB Action Plan (NAP) has been prepared and contributes towards implementation of the Stockholm Convention by Vietnam. The component of institutional strengthening achieved the best outcomes and the PCB management information system has been installed and relevant stakeholders trained to use it.

However, due to the implementation delays, some activities relevant to PCB management demonstration have been postponed and only partially achieved. For example, seven out of originally planned nine storage demonstration sites have been finalized under the project. While this in itself does not affect the achievement of the GEO, delays in identifying sites only allowed to prepare the PCB management plans in these sites and complete storage facilities, but did not

allow for time to actually transport and store PCB-containing equipment to most of the facilities, expect for only one⁴.

On PCB disposal option decision, a notable achievement is development of the draft *Technical Guideline for Decontamination of PCB containing equipment, materials and wastes* that has analyzed variety of disposal options⁵ and selected two technologies as suitable to available technology conditions in Vietnam at present. These technologies (i.e., cement kiln co-incineration and hazardous waste incineration) could be applied in the short-term future while investment in other more modern disposal options, if warranted by inventory analysis, is being made. The analysis has identified one of the cement kiln facilities in Vietnam, Holcim Vietnam Ltd. Co., as the facility that has capacity to treat PCB-contaminated oil, however further analysis on the impacts of the final inventoried and non-inventoried PCB amounts, transportation distances, treatment cost, outcomes of the complicated procedure of PCB-contaminated oil collection from the equipment, remains to be carried out. Given the above minor shortcoming, the achievement of GEO is considered Moderately Satisfactory.

3.3. Efficiency

Rating: *Satisfactory*

The project was designed to contribute both local and global public good by reducing the risk of the release of PCBs into the environment. Due to the lack of reliable baseline data and difficulties associated in measuring the impact of the overall environmental, health and related socio-economic impacts, project preparation team concluded that it was not possible to conduct a traditional economic or financial cost-benefit analysis for the project. However, a cost-effectiveness analysis of four alternative technical solutions was carried out, which also included a business as usual, full disposal and transportation, and pilot (partial) disposal options.

Most of the project investments were consultancy assignments - necessary to establish the regulatory and institutional basis for PCB management and phase-out. Key investments related to the construction of PCB storage facilities. There was no clean-up or remediation of PCB contaminated sites or PCB treatment/disposal carried out as part of the project. Quantification of indirect impacts of safe PCB storage on human and environmental health was not done at completion due to the similar reasons as at preparation, including: (i) assumptions of human health impacts would be impossible to attribute to safe storage only; (ii) there was not health analysis data collected during the project; (iii) only smaller amounts of PCB-containing equipment were actually transferred to the safe storage facilities, thus cutting the pathway of the risk of potential exposure, within project period. The actual costs of storage facilities were in line with the projections at the appraisal and lower compared to other projects elsewhere. Therefore, it appears that the activity and the entire project has been carried out in a cost-effective way. For further details see Annex 3.

⁴ 21 PCB-containing transformers (with oil) and 2 PCB-containing oil tanks have been transferred to EVN storage (Pha Lai site)

⁵ Including (1) incineration in non-slugging incinerators; (2) pyrolysis; (3) alkalized metal reduction at atmospheric pressure and temperatures in the range of 60°C - 180°C; (4) base-catalyzed decomposition (BCD); (5) plasma technology; (6) cement kiln co-incineration; and (7) incineration in hazardous waste incinerators.

3.4 Justification of Overall Outcome Rating

Rating: *Moderately Satisfactory*

The project largely achieved its GEO by evident improvements to the development of the national capacity to manage PCBs and piloting of model of safe storage of PCB waste. Institutional capacity was strengthened, which enabled the development of targeted policy and regulatory arrangements for the long-term control of PCBs within the context of broader national chemicals management objectives. Awareness of those involved in PCB management and broader public on PCBs and hazardous waste was increased. Finally, a system of PCB inventory accounting was put in place, which will make the decision-making on PCB phase-out more informed. The project's concept and design remains highly relevant to Vietnam's obligations under the Stockholm Convention and to its national priorities with respect to pollution and hazardous waste management and environmental protection. Project results were overall achieved in a cost-effective manner with the costs involved in achieving project objectives being reasonable in comparison with the benefits it generated, and the initial estimates. It is clear that overall the project has generated value, however it is not possible to overlook the delays experienced during implementation, which ultimately did not allow to witness the full spectrum of impacts of the interventions, specifically make a fully informed decision on the PCB disposal options and proceed with a follow-up project. Based on this factor, the overall outcome rating is Moderately Satisfactory.

3.5 Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

N/A

(b) Institutional Change/Strengthening

As a result of project implementation, institutional capacity was built and strengthened at several levels. At the level of government, capacity within MONRE, MOIT, as well as their local department (DONRE, DOIT), Customs and Environmental Police was strengthened with respect to technical aspects associated with the development of PCB regulations and PCB management policy, environmental and technical standards, import and export control of PCB materials through workshops, seminars and training. Implementation of the project also strengthened VEA's and EVN's coordination capacity with respect to other ministries within the NLG, with provincial government agencies, and through partnership with various research and scientific institutions that generated valuable research, all of which can now positively contribute to replication of a PCB management strategy at the national level. Training was also provided to the research institutes, laboratories, EVN and enterprises to increase their capacity in sampling, quick and advanced analysis of PCBs, inter-laboratory cross-checks for PCB analysis in transformer oil, emergency response, evaluating prevention, response and recovery of chemical and PCBs incidents. Overall, results achieved were internalized by project partners at all levels, such that they can be drawn upon in future, as required.

(c) Other Unintended Outcomes and Impacts

The project launched a successful public outreach campaign for public awareness on PCB management through articles in press, radio and TV reports, the participation in international seminars for project activities dissemination, preparation of POPs and PCB newsletters,

pamphlets and handbooks. Also, the web portal “pops.org.vn” and a specific PCB website in both English and Vietnamese have been developed and updated periodically during project implementation to provide general audience with information on PCB/POPs policies and regulations and technical information and guidelines pertaining to sound PCB management. The POPs portal and PCB website have been linked to the VEA website and recently have been upgraded with a number of relevant news in English language, for which almost 8 million accesses have been made.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

N/A

4. Assessment of Risk to Development Outcome

Rating: *Moderate*

The risk to development outcome is assessed as Moderate mainly due to risks related to stakeholders. While the project activities provided for a good regulatory basis, it mostly regulates management of dangerous goods, hazardous chemicals, chemicals restricted from production or trading, including PCBs. While this is a great achievement, detailed provisions in the regulations on the responsibilities of stakeholders involved in management of PCB life cycle are still missing. For example, the draft of the MONRE’s Circular on the management of hazardous wastes, including used PCB-containing equipment and parts; hydraulic oil waste; thermal oil and PCB-insulated waste; PCB-containing transformers and capacitors; PCB-containing or contaminated electrical equipment; PCB-containing construction waste and demolition, does not specifically stipulate responsibilities of owners of PCB-containing equipment and material in managing each step of PCB phase-out. In addition, responsibility for environmental handling and remediation of PCB-contaminated areas has also not been decided. These responsibilities need to be specified as soon as possible and/or other incentives for PCB phase-out identified, if Vietnam wants to achieve its Stockholm Convention commitments.

One of the risk mitigation measures that was already embodied in the project was involvement of the Vietnam Electricity (EVN), the biggest owner of PCB-containing equipment in Vietnam, in project demonstration activities. While implementation performance of EVN was uneven at the beginning of project, it nevertheless showed great share of understanding and commitment to the PCB phase-out towards latter part of project, as evidenced by own resource allocation for upgrading of existing PCB storage facilities, keen interest in leading dialogue on PCB disposal options, as well as increased human resource capacity through activities provided under the training.

5. Assessment of Bank and Borrower Performance

5.1 Bank

(a) Bank Performance in Ensuring Quality at Entry

Rating: *Satisfactory*

The project preparation took almost four years. While it took about a year from the PCN review until the first preparation mission, the new task team was committed and persistent in delivering this complex project. Most of the preparation delays were due to reasons that would be difficult for the Bank to directly resolve. These included changes in co-financing requirements by GEF, reduction of initially planned GEF grant amount by almost half and initial removal of the project

from the pipeline entry by the GEF CEO. Despite of these difficulties, the Bank team and management worked tirelessly with the counterparts to move ahead with project preparation, including securing adequate funding for preparation from the GEF project preparation grant and Canadian POPs trust fund. Additional delay emerged at the time of preparation of environmental safeguards documents. Nevertheless, the design of project and its strategic relevance was based on detailed analysis and studies. The M&E system, particularly inclusion of MIS development as part of project activities was the right approach. Also, the team's efforts to obtain thorough data to carry out project's cost-effectiveness analysis is commendable. While the risk levels for few of the risks was somewhat underestimated, the overall performance of the Bank during preparation was Satisfactory.

(b) Quality of Supervision

Rating: *Satisfactory*

The Bank's supervision team provided Government and other project counterparts with consistent, timely and best available policy and technical advice, including guidance on financial management, procurement and environmental safeguard issues, through regular supervision missions, including frequent site visits, as evidenced by thorough aide memoires. As the aide memoires demonstrate, the Bank team maintained a constructive dialogue with both PMUs to address the various complex implementation issues that arose. The team was particularly proactive and worked on the basis of newly agreed action plans and milestones at the times of project implementation delays. Specific FM and procurement training was provided for PMU staff in order to ensure that the project's fiduciary and procurement requirements were respected. The quality of supervision is consequently rated Satisfactory.

(c) Justification of Rating for Overall Bank Performance

Rating: *Satisfactory*

Given the Satisfactory ratings for both quality at entry and supervision, the overall Bank performance rating is Satisfactory.

5.2 Borrower

(a) Government Performance

Rating: *Satisfactory*

Government performance, rated across the spectrum of the project's full implementation is considered to have been Satisfactory. The Government was and remains a strong advocate for action in support of the Stockholm Convention. Agencies involved through the Project Leading Group and NLG, and at the provincial level, all played a role, to varying degrees, in ensuring the development of comprehensive policy frameworks at the national and provincial levels, advancing a diverse national capacity base to address the issue into the future, and promoting awareness about the importance of sustainable hazardous waste management.

The project benefited from political will and commitment, witnessed by actual counterpart funding that was in line with the commitment at preparation, from both the national and provincial governments and EVN, which contributed to project team operations, to the development of a sound policy and regulatory framework, as well as to the design of the National PCB Action Plan, as well as discussions on moving forward to a choice of a proper disposal option.

(b) Implementing Agency or Agencies Performance

Rating: *Moderately Satisfactory*

The two PMUs' performance, particularly in the earlier stages of the project and particularly related to EVN activities resulted in delays, which is a reason for rating the overall performance less than satisfactory. In the later part however, the PMUs managed to make up for the lost time, and implementation proceeded at a satisfactory pace, with quality of procurement documents and technical specifications increasing and disbursements accelerating. Collaboration between the two PMUs could have been stronger, particularly when agreeing on the PCB inventory methodology and other common activities. In spite of these difficulties, the project was almost fully disbursed and most of the project activities originally planned had been executed, which would not be possible without overall good performance of the implementing agencies.

(c) Justification of Rating for Overall Borrower Performance

Rating: *Moderately Satisfactory*

Overall, Borrower performance is considered to have been Moderately Satisfactory. Commitment to achieving the GEO, in accordance with obligations under the Stockholm Convention, was manifested throughout project implementation teams that were committed to managing and monitoring for results, despite certain difficulties with respect to management capacity, as noted above. Also, the government support and commitment throughout both project preparation and implementation phase was excellent.

6. Lessons Learned

- ***Final hazardous waste disposal options need to be based on good baseline inventory data, on the other hand decision on disposal should not be delayed*** – The project preparation team and the client made a pragmatic decision to halt the decision on investment in disposal facility(ies) until sufficient data on the amounts and locations of PCBs become available. Given the limited initial financing available, it is important to have a cost-effectiveness analysis to compare what different disposal options cost. While construction of temporary storages is not a long-term solution, it is warranted in situations when benefits outweigh costs and risks.
- ***Establishment of a regulatory framework is a priority*** – It is important to not only ensure phase-out of the existing amounts of hazardous waste and PCBs, but also to avoid cross-contamination and increase of PCBs in environment. One of the critical issues that Vietnam faced at the onset was poor practice of storage of retired electrical equipment and PCB oils that are prone to create cross-contamination due to lack of proper regulations and technical guidelines. Adoption of the necessary regulations was key to start adoption of good environmental practices. Technical guidelines, training and demonstration activities enhanced these results.
- ***Public outreach activities need to be carefully designed, tailored to the right audiences and appropriately timed*** – While the public outreach activities under the project were successfully implemented and increased public awareness, the upgrade of EVN PCB storages, which were located next to populated areas, had difficulties receiving an approval from the nearby residents. A message and closer communication with the affected beneficiaries to explain the benefits of upgrading hazardous waste facilities to safer standards, thus securing safer environment could have possibly avoided this.
- ***Project interventions targeting biggest owner of PCB equipment need to be carefully designed in order to achieve intended impacts*** – While EVN is the biggest owner of the PCB

equipment, the project interventions in terms of number of activities and costs were mostly targeted to non-EVN enterprises. While this was a pragmatic decision, given the financial capacity of the EVN and presumption that limited demonstration activities would enable EVN to scale them up, EVN's commitment to project activities appeared to be uneven, particularly in the early stages of the project.

- ***Flexibility of sequencing project interventions is crucial in projects that involve data collection and planning phase*** – As PCB inventory that was to feed in decisions on the follow-up activities was delayed, these activities also resulted in delays. The implementation teams took the right decision to start the follow-up activities despite of availability of full inventory data. Such flexibility in staging the activities is a pragmatic solution when project implementation delays are experienced.

- ***Consultant selection criteria should be carefully thought through, particularly for the key activities*** - Contract management may appear to be a complex issue. The TORs and qualification criteria should be properly designed to attract qualified and reputable companies that are interested to commit the initially proposed teams as well as provide quality and timely outputs. Cancelling of the contract due to poor performance and re-bidding is complicated and time-consuming and might not always be an option given the sequence of activities and project closing dates.

- ***Collaboration between implementing agencies is crucial to avoid implementation delays and achieve best results*** – When two implementing agencies are involved, particularly in carrying out joint activities, collaboration between them is essential, as in the project case evidenced by the decision-making process related to the PCB inventory methodology between EVN and VEA PMUs.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

The first draft Project Completion Report prepared by the PMUs was sent to the Bank on October 28, 2015. In evaluating project design and achievements, the report indicates satisfaction with project outcomes. The impact that the project's implementation had with respect to raising consciousness with regard to PCB management issues at all levels of society is considered to be key to the sustainability of efforts. A summary of Recipient's completion report can be found in Annex 7.

The draft ICR was shared with VEA and EVN, their comments incorporated in the final report and concurrence received on **XXX**.

(b) Cofinanciers

N/A

(c) Other partners and stakeholders

(e.g. NGOs/private sector/civil society)

N/A

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
1. PCB management framework and action plan	4.164	2.243	
2. PCB management demonstration	4.978	2.190	
3. Institutional strengthening	3.787	1.406	
4. Monitoring and evaluation	2.275	0.281	
5. Project management	1.744	0.710	
Total Baseline Cost	16.948	6.827	
Contingencies	0.552		
Total Project Costs	17.500		
Project Preparation Facility (PPF)	0.350	0.347	
Total Financing Required	17.850		

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Borrower	Counterpart financing	6.34	6.65	104.8
Global Environment Facility (GEF)	Grant	7.00	6.83	97.5
Local Sources of Borrowing Country	In-kind	3.15	2.60	82.5
SWITZERLAND: Swiss Agency for Dev. & Coop. (SDC)	In-kind	1.01	1.00	99.0
TOTAL		17.50	17.08	97.6

Annex 2. Outputs by Component

PAD output	Actual output
<p>Component 1: PCB Management Framework and Action Plan <i>Sub-component 1.1 : Development of a comprehensive set of PCB regulations</i></p> <p>Legal definition of PCBs</p>	<p>Definitions provided in the below listed regulations</p>
<p>Definitions of PCB-contaminated wastes</p>	<p>Draft⁶ National Technical Regulations on the permissible limit of PCBs in soil</p> <p>Draft Vietnam standards on analysis of PCBs, incl. (i) Standard on instruction for grid sampling of PCBs contaminated soil; (ii) Standard on analysis of PCBs in non-porous solid material surface; (iii) Standard on analysis of PCBs in biological sample; (iv) Standards on analysis of PCBs in insulating oils; (v) Standards on analysis of PCBs in soil/sediments</p> <p>Draft Regulations for control of toxic releases, incl. PCB in ship dismantlement and industrial zone activities</p>
<p>Retirement schedule of PCB-containing equipment for various applications, if any</p>	<p>Legal document⁷ on ‘Retirement schedule of PCB-containing equipment; Restriction on re-use and recycle of PCB-containing oil’</p>
<p>Restriction on reuse and recycle of PCB-containing oils</p>	<p>National Technical Regulations QCVN 56:2013/BTNMT on Waste Oil Recycling (MONRE; Dec 31, 2013)</p> <p>Legal document on ‘Retirement schedule of PCB-containing equipment; Restriction on re-use and recycle of PCB-containing oil’</p>
<p>Requirements for labeling, packaging and on-site storage facilities</p>	<p>Draft Circular on management of PCB-containing equipment, products, and materials⁸</p>
<p>Methods for transport and disposal of PCB-</p>	<p>Draft Circular on management of PCB-</p>

⁶ All Draft documents mentioned in output section have been prepared and submitted to the relevant authorities for adoption, expected in 2015/2016

⁷ Legal documents serve as background analysis documents and have been incorporated in (1) Circular on PCB management; (2) NIP; and (3) National PCB Action Plan

⁸ Based on analysis and recommendations from the project financed report ‘Requirements and guidelines for registration, labelling, packaging, on-site storage, on-site storage facilities, and reporting with respect to PCB oils, equipment, and hazardous waste, applicable to PCB waste generators, PCB owners; Method for transport and disposal of PCB oils and hazardous waste’

containing oils and wastes	containing equipment, products, and materials ⁸
Requirements for contingency/emergency response plans	Draft Circular on management of PCB-containing equipment, products, and materials ⁹
Registration and reporting of PCB-containing oils, equipment and wastes	Draft Circular on management of PCB-containing equipment, products, and materials ⁸
Roles and responsibilities of government agencies on inspection and enforcement	Legal document on ‘Roles and responsibilities of government agencies on inspection and law enforcement; and Liability-based cost recovery system to support implementation of sound PCB management’
Liability-based cost recovery system to support implementation of sound PCB management	Legal document on ‘Roles and responsibilities of government agencies on inspection and law enforcement; and Liability-based cost recovery system to support implementation of sound PCB management’
Amendments of Decision 155/1999 on hazardous wastes management taking into account provisions of Decision 23/2006 and Circular 12/2006	Circular 12/2011/TT-BTNMT of April 14, 2011 of MONRE stipulating hazardous waste management Circular 36/2015/TT-BTNMT of MONRE stipulating hazardous waste management (Revision of Circular 12/2011/TT-BTNMT) QCVN 07:2009/BTNMT on technical regulations for hazardous waste threshold ¹⁰
Update of occupational health and safety legislation and regulations under the Ministry of Labor, War Invalids and Social Affairs to cover PCBs	Report on ‘Legal definition of PCBs; revision and update of policies and regulations with respect to PCBs’ Report on ‘Assessment and recommendation for environmental health management related to toxic chemicals (PCB, PTS, mercury, etc.)’
Revision of TCVN 5507 - 2002 to reclassify PCBs as toxic chemical, instead of flammable material	Revision completed
Update of provincial policies and regulations in the demonstration provinces covered by the project	Report on ‘Legal definition of PCBs; revision and update of policies and regulations with respect to PCBs’
<i>Sub-component 1.2: Technical and administrative guidelines</i>	

⁹ Based on analysis and recommendations from the project financed reports ‘Requirements for contingency/emergency response plans’, ‘Development of national plan and measures for capacity building and prevention, response and remediation of environmental incidents related to PCBs/POPs/PTS’, ‘Development of training materials and training plans for some selected local authorities as a demonstration and prevention and responses for environmental incidents related to PCBs/POPs and other toxic chemicals’

¹⁰ These documents were partly supported by the project by involving project hired PCB expert from MONRE

Review and revision of technical guidelines for land-filling of hazardous wastes (Decision 60, 2002, MOSTE)	Draft National Technical Regulation QCVN xx:2015/BTNMT on landfilling of hazardous waste
Review and revision of the design standards for construction of hazardous waste landfills, TCXDVN320-2004	Review completed by project financed report, submitted to VEA/MONRE
Review and revision of the guidelines for the use of cement kilns for disposal of hazardous wastes	National Technical Regulation QCVN 41:2011/BTNMT on co-processing of hazardous waste in cement kilns (MONRE; Dec 26, 2011)
Guidelines for identification, management, repair and retro-fitting of PCB-containing equipment	Guidelines on identification of PCB-containing oil, equipment, materials, and waste (VEA; Nov 20, 2014)
Guidelines for the registration process for PCB waste generators and PCB owners	Guidelines on registration of PCB-containing oil, equipment, materials, and waste (VEA; Nov 20, 2014)
Guidelines for labeling, packaging, transport, and storage of hazardous wastes, including PCBs	Guidelines on packaging and labelling of PCB-containing oil, equipment, materials, and waste (VEA; Nov 20, 2014)
Guidelines for decontamination of PCB-containing transformers	Guidelines on decontamination and disposal of PCB-containing oil, equipment, materials, and waste (VEA; Nov 20, 2014)
Guidelines for on-site storage of PCB-containing equipment and materials	Guidelines on storage of PCB-containing oil, equipment, materials, and waste (VEA; Nov 20, 2014) Guidelines on transportation of PCB-containing oil, equipment, materials, and waste (VEA; Nov 20, 2014)
Guidelines for emergency response	Guidelines on response and contingency plan development on PCBs (VEA; Nov 20, 2014) Guidelines on prevention and response of PCB incidents (VEA; Nov 20, 2014)
Guidelines/Protocols for inspection officers	Guidelines on inspection of PCB management (VEA; Nov 20, 2014)
	Collaborative Code of Practice – 01QCLN-TCMT=TCHQ between VEA and General Department of Customs in environment protection during export and import of some articles, including PCBs/POPs
<i>Sub-component 1.3: National PCB management action plan</i>	
Inventory methodology	Completed
National PCB inventory	Completed for non-EVN; almost completed for EVN
National PCB Management Action Plan	Draft Completed and submitted to MOIT for enacting
Component 2: PCB Management Demonstration <i>Sub-component 2.1 : Site-specific</i>	

<i>investigations</i> Site investigations at 15 selected facilities in 10 demonstration provinces	Completed in 7 sites in 7 provinces
<i>Sub-component 2.2: Site-specific PCB management plans</i> Site-specific PCB management plans in demonstration facilities	7 management plans in demonstration sites
<i>Sub-component 2.3: Voluntary retirement of PCB-containing equipment at some facilities in Pha Lai Power Company etc.</i>	21 PCB-containing transformers in Pha Lai Power Company retired
<i>Sub-component 2.4: Proper handling of PCB-containing oils and equipment</i> Implementation of the site-specific PCB management plans developed under sub-component 2.2	Implementation started in 7 demonstration sites completed under sub-component 2.2 ¹¹
Identification, inspection, labeling, maintenance, packaging, transportation, and temporary storage of PCBs at the 15 sites	Temporary storage completed in 1 storage site
<i>Sub-component 2.5: Infrastructure improvement</i> Improvement of existing storage facilities at the demonstration sites	New storage facilities constructed in 7 demonstration sites; several additional EVN facilities upgraded
Laboratory upgrade - PCB test kits or analyzers for the 15 sites	2 PCB analyzers for 2 EVN subsidiaries; PCB analyzers and quick tests took kits for 6 VEA sites
Oil recycling units and servicing tools in 15 sites	2 oil recycling units for 2 EVN subsidiaries; Oil recycling units PCB analyzers and quick tests took kits for 6 VEA sites
<i>Sub-component 2.6: Demonstration of administrative measures for PCB management</i> Inspection officers of relevant authorities will conduct inspections of at least 25 sites (including the 15 demonstration sites) per year	44 facilities based in 15 provinces/cities inspected by inspection officers of VEA
VEA to undertake at least 5 inspections per year at other sites in the selected provinces	80 sites (in 5 years) visited and inspected by DONREs and VEA
During site inspections, sampling and screening of at least 20 PCB-containing oils and wastes at each site; On average about 10 soil samples per site sent for detailed chemical analyses by gas chromatography technique at the certified laboratories	151 samples of PCB-containing oils as well as soil samples collected and analyzed
Selected customs offices implement protocols	NinhBinh Custom Office implemented pilot

¹¹ For non-EVN sites: 17 containers of 20ft have been installed in 6 sites

to be developed under this project to carry out import/export inspection	protocol
Brief reports summarizing findings at each inspected sites processed by the MIS for future evaluation	All reports and information on VEA supervision activities of PCB management at Quang Ninh Port were uploaded to the MIS
Component 3: Institutional Strengthening <i>Sub-component 3.1 : PCB management capacity development</i>	
International PCB expert recruited	3 international PCB experts recruited
Training on export/import control of PCB-containing materials	2 trainings with 180 participants
PCB screening and sampling training	3 trainings with 180 participants
PCB testing and analysis training	4 trainings with 160 participants
PCB management technical training	4 trainings with 220 participants
Emergency response training	5 trainings with 345 participants
PCB management policy training	5 trainings with 400 participants
<i>Sub-component 3.2: Public outreach</i>	
Training of journalists.	4 trainings with 200 participants
Media coverage of PCB issues and project	Media outputs include: (i) 6 articles for gov officials; (ii) 6 articles for enterprise management; (iii) 15 articles for workers and general public; (iv) 4 in-depth technical articles; (v) 5 radio reports; (vi) 6 video/TV trainings; (vii) leaflets for enterprises, and action leaflets; (viii) posters; (ix) newsletter
Advertisements in national and local newspapers and professional journals	See above
Occupational health education program	2 trainings with 120 participants
Production and distribution of public awareness materials	See above
National and international workshops	1 international workshop organized in Vietnam with 132 delegates Participation in 5 international workshops (25 participants from Vietnam)
Component 4: Monitoring and evaluation <i>Sub-component 4.1: PCB management information system (MIS)</i>	MIS completed and operational
<i>Sub-component 4.2: Project launch workshop</i>	Project launch workshop carried out in March 2010 with 200 participants
<i>Sub-component 4.3: Project monitoring and evaluation</i>	
Project Steering Committee annual meetings	5 annual meetings
Annual review workshops	5 ministerial meetings to collect comments and improve cooperation between stakeholders
Mid-term and project completion review	Mid-term progress report submitted; Draft completion report submitted on October 28, 2015
<i>Sub-component 4.4: Implementation</i>	Completion workshop carried out in June

<i>completion workshop</i>	2015 with almost 100 participants
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Annex 3. Economic and Financial Analysis

The project was designed to contribute both local and global public good by reducing the risk of the release of PCBs into the environment. Due to the lack of reliable baseline data and difficulties associated in measuring the impact of the overall environmental, health and related socio-economic impacts, project preparation team concluded that it was not possible to conduct a traditional economic or financial cost-benefit analysis for the project. However, a cost-effectiveness analysis of four alternative technical solutions was carried out, which also included a business as usual, full disposal and transportation, and pilot (partial) disposal options.

Most of the project investments were consultancy assignments - necessary to establish the regulatory and institutional basis for PCB management and phase-out. In addition to smaller purchases of laboratory testing and monitoring equipment, and MIS software, the key investment related to the construction of PCB storage facilities. There was no clean-up or remediation of PCB-contaminated sites or PCB treatment/disposal carried out as part of the project. Quantification of indirect impacts of safe PCB storage on human and environmental health was not done at completion due to similar reasons as at preparation, including: (i) assumptions of human health impacts would be impossible to attribute to safe storage only; (ii) there was not health analysis data collected during the project; (iii) only smaller amounts of PCB-containing equipment was actually transferred to the safe storage facilities, thus cutting the pathway of the risk of potential exposure, within project period. The actual costs of storage facilities (USD 303,691 for the six non-EVN sites) was in line with the projections at the appraisal. The storage capacity of these facilities sites is about 250t of PCB-containing equipment and waste, thus the storage cost for 1 ton of PCB is around USD 1,215. Most of the PCB management projects in other countries, for example in Moldova, Belarus, Tunisia, Egypt were focusing on final disposal/transportation of the PCB waste rather than storage of PCBs. Philippines PCB management project intends to build a temporary PCB storage but this activity has not yet been initiated, therefore cost information for comparison reasons is not available. The PCB management project in Nigeria that has been recently approved is in scope similar to Vietnam PCB management project and will upgrade the interim storage facilities, but as in Philippines case, the cost information is not available. The PCB management project in China, as one of the sub-activities provided for an interim storage of highly-contaminated PCB waste, and the cost data available reveal that cost per ton of storage was about five times higher than in Vietnam. Considering that the storage facilities procured under the project are mobile, there are 7 of them and they are located in various evenly distributed locations throughout the country, it appears that the activity has been carried out in a cost-effective way.

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Douglas J. Graham	Sr. Environmental Specialist	EASVS	TTL/ Environment
Jiang Ru	Operations Officer	EASOP	Co-TTL
Helen Chan	Sr. Operations Officer	EASRE	TTL during preparation
Viraj Vithoontien	Sr. Regional Coordinator	ENVMP	Environment
Hoang Xuan Nguyen	Procurement Analyst	EAPCO	Procurement
Hung Viet Le	Sr. Financial Management Specialist	EAPCO	FM
Cung Van Pham	Financial Management Specialist	EAPCO	FM
Hoi-Chan Nguyen	Sr. Counsel	LEGES	Legal
Mei Wang	Sr. Counsel	LEGES	Legal
Quang Ngoc Bui	Social Specialist	EASVS	Social
Trang Thi Phuong Nguyen	Environmental Specialist	EASVS	Environment
Toan Huy Ngo	Environmental Specialist	EASVS	Environment
Giang Thanh Huong Le	Program Assistant	EACVF	Administrative
Evelyn Bautista Laguidao	Program Assistant	EASRE	Administrative
Nina Queen	Sr. Program Assistant	EASRE	Administrative
Supervision/ICR			
Douglas J. Graham	Sr. Environmental Specialist	GENDR	TTL
Jiang Ru	Sr. Environmental Specialist	GENDR	Co-TTL
Hisham A. Abdo Kahin	Lead Counsel	LEGES	Legal
Giang Thanh Huong Le	Program Assistant	GTIDR	Administrative
Huy Toan Ngo	Environmental Specialist	EASVS - HIS	Environment
Hoang Xuan Nguyen	Procurement Specialist	GGODR	Procurement
Ba Liu Nguyen	Procurement Specialist	GGODR	Procurement
Ha Thuy Tran	Financial Management Specialist	GGODR	FM
Ruxandra Maria Floroiu	Sr. Environmental Engineer	GENDR	TTL at ICR
Thuy Cam Duong	Environmental Specialist	GENDR	Co-TTL at ICR
Solvita Klapare	Environmental Economist	GENDR	ICR author
Quyên Thuy Dinh	Program Assistant	EACVF	Administrative

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)		Note
	No. of staff weeks	USD (including travel and consultant costs)	
Lending			
FY2007	14.38	60,726.01	BBGEF
FY2008	28.19	113,835.65	BBGEF
FY2009	21.81	109,998.64	BBGEF
Total		284,560.30	
Supervision/ICR			
FY2010	9.59	36,392.20	BBGEF
FY2011	10.31	54,547.64	BBGEF
FY2012	9.05	52,297.19	BBGEF
FY2013	8.90	49,121.50	BBGEF
FY2014	14.36	50,799.55	BBGEF
FY2015	18.42	71,200.56	TF018171
FY2016	5.18	19,497.99	TF018171 (As per Nov 2, 2015)
Total			

Annex 5. Beneficiary Survey Results

N/A

Annex 6. Stakeholder Workshop Report and Results

The project completion workshop took place on June XX, 2015. The following paragraphs summarize the results of the workshop.

The project results and activities have been appreciated by many organizations, government agencies, including MONRE and DONREs, MOIT and DOITs, Ministry of Health, Ministry of Agriculture and Rural Development, Ministry of Construction, Ministry of Labour, Invalids and Social Affairs, General Administration of Customs, the local Customs Departments, Market Management Agencies, Police Department of the environmental crime prevention (EP) and provincial Police Divisions of environmental crime prevention, Provincial People's Committees, etc. These institutions concluded that the following are the key contributions of the project:

- The agencies have benefited from the capacity building activities, such as staff training, information provision; equipment for environment monitoring, inspection and supervision activities on PCBs, POPs and hazardous chemicals.
- Several agencies were provided office equipment, computers, servers, cars to support project implementation, and implementation of governmental programs related to PCB management.
- Government officials from several agencies have participated in overseas research, training activities, international conferences, and have visited laboratories, waste treatment facilities, etc. Thereby, their capacity and knowledge have been strengthened in PCBs, POPs and chemicals management.
- Domestic workshops and training activities served as forums for stakeholders to exchange information, provide consultations, share experiences on the government management for PCBs, hazardous waste, toxic chemicals, and prevention and control of environmental incidents.
- In general, management capacity of government agencies has been strengthened through the expanded regulatory framework, technical guidelines and mechanisms for inter-sectoral collaboration; channels built to exchange information and share experiences and coordinate inter-sectoral management and monitoring.
- The project has also contributed to the development of mechanisms for exchange and cooperation between government agencies, enterprises and media units, dissemination of information and awareness raising on the risks of PCBs and hazardous chemicals, and benefits of safe management of these chemicals.
- State and private enterprises, as well as corporations, such as EVN, Vinachem, trading and manufacturing facilities owning electrical equipment, also appreciated project interventions, including the benefits of increased information, awareness raising about the PCBs and environmental protection and investment in infrastructure. Namely:
 - EVN has benefitted from awareness and knowledge about PCBs; has implemented the internal PCB inventory, focusing on equipment with the highest risk of PCB contamination; collection of information about PCBs to enable the future suitable management of PCB-containing materials, including basis for informed decisions on the storage, disposal and treatment strategies. Besides, some units in EVN have received investment in infrastructure and equipment, such as PCB storage, quick test tool kits, filters, packaging materials etc.

- In the project framework, many units in EVN have been trained in developing PCB management plans, environmental incident prevention and response plans, dissemination of updated regulations on hazardous waste management etc.
- Non-EVN enterprises have also benefitted from significant improvement in the level of awareness about the risks and safe management of PCBs, toxic chemicals and hazardous waste management, through training, communications and performed inspection, and testing activities, such as water supply and sewerage companies, paper, engineering mechanic, brick manufacturers, poultry farms, minerals enterprises, etc.
- Staff and management of PCB and hazardous waste storage facilities and treatment units have benefitted from the training and communication activities; waste management processes and plans development; some units received equipment, upgraded infrastructure, received information/training on PCBs and other hazardous chemical containing wastes.
- Management Boards of industrial zones/industrial parks increased their awareness level about PCBs, POPs, strengthened capacity on prevention and response to environmental incidents, improved their knowledge about general pollution prevention and control.
- Research Centers and Institutes and laboratories were provided with information, additionally trained on analysis, monitoring, risk assessment, safe management of PCBs and similar toxic chemicals. These units also benefitted from the provision of advisory services; some were equipped with analysis equipment and consumable material.
- Through the project, Inter-Laboratories Inspection activities have created a sharing experience channel on methods, processes of analyzing, monitoring of POPs in Vietnam as well as quality control process, coordination mechanism, strengthening cooperation, building a network between laboratories.
- Universities were provided with updated/state of art information, syllabi, technical documentation on the safe management of POPs, PCBs.
- Other social organizations benefitted from information, awareness raising, access to brochures, manuals.
- The press, media agencies and journalists received training, and latest comprehensive information. Through the activities of the project, experts in the field of management and science shared expert information with journalists to enable delivering the messages to a broader audience in easy to understand and accurate information. They also participated in the survey group, business meetings to raise awareness of the fact to have the right view of environmental, health risks and business activities; trained and supported for communication and professional development activities through training of trainers, communicators.

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

ASSESSMENT OF OUTCOMES

a) Relevance of Objectives, Design, and Implementation

In order to achieve country's as well as global objectives on environment protection and safe management of PCBs, the project established two Project Development Objectives, including: (i) to develop national capacity in Vietnam to manage all PCBs and (ii) on a pilot basis in selected provinces safely store significant amounts of PCBs in anticipation of future disposal, towards the final goals of safety management and reduce releases of PCBs into environment at national scale.

The specific objectives of the project were also set properly, including: (i) development of legal and institutional framework for PCB management; development of National Action Plan on PCB management and safe disposal; (ii) demonstration of PCB management in major sectors that use PCB and in 10 selected provinces; and (iii) capacity building for all stakeholders on sound management of PCBs; awareness raising for the public. The rationale of those objectives has been confirmed at the end of the project through implemented activities and achieved results.

Regarding project design, components and activities of the project were developed adequately and were feasible for the Vietnam's country situation, including the institutional mechanisms and coordination among relating organizations, agencies and enterprises.

Original budget allocations for components and activities were also appropriate. However, regarding EVN storage improvement, the selection of location faced some difficulties, and therefore, the number of facilities did not meet the original target. The saving were used to purchase more analytical equipment for identification of additional PCBs containing materials and equipment, as well as packaging materials.

Achieved outcomes and outputs proved that project's specific objectives have been achieved and scope of some activities has even exceeded the original expectations. Furthermore, some new activities have been added to the scope of the project with approval from the Government and the WB, but still consistent with the initial objectives, in order to support the long-term results and ensure sustainability of the project.

The design of 2 PMUs in different agencies with separated and specific responsibilities has increased the responsibility of 3 project owners namely MONRE, MOIT and EVN, led to the increase of human resources mobilized for the project and facilitated the parallel implementation of the project activities. Active involvement of 3 project owners also led to increase in mobilization of co-financing sources. The coordination and information exchange between MONRE and MOIT was close and effective.

b) Achievement of Project Development Objectives

As mentioned above, the project has been designed with 2 PDOs, towards the ultimate goal of sound management and reduction of PCB release to environment and human exposure in Vietnam.

The first PDO "to develop national capacity in Vietnam to manage all PCBs" - after the implementation and completion of project activities, the PCB management capacity in Vietnam in general has been strengthened considerably, including on a national scale, covering institutional

capacity increase, development of policies and inter-ministerial coordination mechanisms, increasing awareness, and improving state of science and technology, etc. In terms of awareness, public awareness campaigns were highly successful in raising knowledge and awareness, which resulted in change of behavior and attitudes, especially in governmental management authorities and enterprises. Regarding training, the project has provided with a lot of related training courses and workshops; those training courses and workshops were highly appreciated by relevant departments and agencies, customs agencies, environmental police, and enterprises, etc. Development of legal framework, building institutional capacity and public awareness raising have contributed significantly to prevention of PCB and POPs in general further contamination.

The second PDO has also been successfully achieved and storage capacity has been enhanced. Specifically, EVN's PCB safe demonstration storage was completed at Pha Lai, and also upgraded in Quang Ninh, Dong Anh, Hanoi, Da Nang, Dong Nai, Hochiminh City, etc. For non-EVN sites, storage facilities are also ready to store PCB-containing equipment and materials. Procedures on safe storage and operation and EIAs were developed appropriately for each specific site, the staff were trained ensuring human capacity to operate the facility safely; plans on prevention and emergency response were developed completely and trainings for each site were implemented; quick test kits to identify materials and wastes containing PCB, oil filters to reduce risks of cross contamination, safety equipment and personal protective equipment were also purchased.

At some sites, a number of PCB-containing waste is kept safely, such as 7 tons of PCBs contaminated waste at Cai Lan Port (then was transported and safely disposed), equipment containing PCB is stored at Pha Lai storage, waste oils and PCB equipment also safely stored in multiple storage facilities under subsidiaries of EVN, such as Electricity of Dong Nai, Hochiminh City, Hanoi, Quang Ninh.

Six PCB storage facilities were improved at waste management and waste oil recycling facilities. These storages meet legal requirements to store PCBs as soon as PCBs are detected.

c) Efficiency

Implementing costs at the moments of deploying project activities and PCB management:

1. Project cost: 7,000,000 USD and co-financing to implement following activities:
 - 1.1. Cost to develop PCBs management policy
 - 1.2. EVN and non-EVN inventory
 - 1.3. Build EVN storage
 - 1.4. Build and improve non-EVN storages
 - 1.5. Materials, equipments for sites
 - 1.6. Public awareness campaign, training, raising knowledge and awareness
 - 1.7. Expanded activities: analysis equipments, environmental health
2. Costs of deploying and applying new policies, regulations:
 - 2.1. Dissemination and guide implementation of new regulations, guidelines
 - 2.2. Analysis and disposal applying Vietnam standards, National technical regulations, and regulations
 - 2.3. Replacement of transformers, electrical equipment
 - 2.4. Storing cost of equipments, wastes containing PCBs
 - 2.5. Disposal of oils, wastes containing PCBs
 - 2.6. Analysis, environmental monitoring related to PCBs pollution

3. Results obtained in terms of economy and society:
 - 3.1. Environmental benefits: reduced pollution of soil, water, sediment; tourism environmental protection (e.g., handling PCBs in Halong Bay, Quang Ninh)
 - 3.2. Protect export market of seafood and agricultural produce: prevention of pollution in aquaculture, controlling the spread of PCBs in exported products chain
 - 3.3. Safe management of PCBs thus reducing the cost of monitoring and risk assessment for contaminated sites, in environment in general and in food chain
 - 3.4. Health benefits: reduced exposure of workers, reduced accumulation in food chain, and reduced illness in community; reduced risks to health of the people in consumer society.
 - 3.5. Demonstrating responsibility of Vietnam to the international community on protection of the environment and health.

d) Justification of Overall Outcome Rating

Above sections summarized main results of the project. Regarding the first objective, the project completed legal framework on POPs in general and PCBs in particular, and the capacity of offices and the cooperation between functional agencies of MONRE, MOIT, General Department of Customs, MOH, EVN, Environmental Police, etc. have been strengthened. These results also increased the cooperation mechanisms between central authorities and local authorities regarding sound management of PCBs and control of toxic chemicals in general. As a result, it could be concluded that the project archived the first objective, results are sustainable, and therefore can be rated Satisfactory.

For the second objective, the project cooperated with functional agencies to conduct activities on monitoring, inspection, guidance on PCB management at number of facilities from the north to the south of Vietnam. These activities were implemented based on requirements and technical guidelines developed in framework of the project. These activities effectively contributed to the sound management of PCBs as well hazardous waste in general; awareness and activities on safe management and disposal of equipment and materials containing PCB have also been increased. The periodic monitoring and inspection resulted in the facilities to understand the risks and requirements on PCBs management, implement suitable activities, and create an effective information exchange channels with relevant authorities.

In conjunction with the increase in PCB management capacity, the project completed the construction/improvement of facilities for safe storage of PCB. In this activity, the project investigated 14 facilities that store, recycle, maintain transformers; store, dispose hazardous waste in order to select the sites that require improvement in compliance with requirements regarding PCBs. Six non-EVN PCB storage sites and one EVN site were then constructed/improved for storage as part of project activities. In addition, these storing sites were equipped with necessary equipment and materials, such as quick test tool kits, oil filters, packaging and labelling materials etc. for safe operation and avoidance of cross-contamination. These seven storage sites are located in different seven provinces along Vietnam for safe transportation and storage of PCBs.

Before project start, there were only two laboratories having capacity on providing accurate analysis of PCBs; however, at that time, relevant authorities had not yet officially certified the capacity of those laboratories. The project implemented number of activities on investigation of capacity of laboratories in Vietnam on POPs/PCBs analysis; training on POPs/PCBs analysis

using quick test tool kits and advanced analytical instruments (Gas chromatography – GC) in different sample matrix, such as insulating oils, sediments, soils, wastewater, etc. for technical staff from laboratories, institutions, Government offices of VEA, DONRE, DOIT, Departments of Customs, environmental offices, etc. In addition to this technical training, two inter-laboratory crosscheck campaigns were organized for up to 25 Vietnam laboratories and two international laboratories. Until now, based on training activities and results from cross check campaigns, six Vietnam laboratories have capacity of PCBs analysis; and four among them have been certified by VEA (following Decree No. 127/2014/NĐ-CP).

While not originally planned, the project also carried out environmental risk assessments, environmental health aspect analysis regarding PCBs/toxic chemicals, control of PCBs and toxic chemicals pollution in ship dismantlement and industrial zone. Those activities have created a close integration between PCBs management and pollution control activities, environmental protection in general, and the sustainability of the project.

Strengthened capacity is an important component of the Vietnam PCB Management Project not only in attracting the participation of communities in the management of PCBs through knowledge of hazards of PCBs to health and environment but also in helping with compliance with PCB management plan developed by the Government of Vietnam. With the objectives of: (i) strengthen capacity of relevant stakeholders in management of PCBs and (ii) mobilize public support for sound PCBs management, the Vietnam PCB Management Project has implemented capacity building activities on many aspects, including activities to strengthen the transfer of technical knowledge, which have been done through the activities of the awarded consultant service contracts, trainings/workshops, etc. More than 45 workshops/training courses for approximately 4,300 participants nationwide from local units, including DONRE, DOIT, DOLISA, Customs, Environmental Police, research institutes, laboratories, enterprises, etc. have been organized during last five years of the project. Followings are few typical activities: Training workshops on import and export control of PCB materials; Training workshops on sampling, quick analysis of PCBs, and advanced analysis of PCBs; Inter-laboratory crosschecks for PCB analysis in transformer oil; Training workshops on emergency response; Workshops on evaluating prevention, response and recovery of chemical and PCBs incidents; Training workshops on PCB management policy; Training workshops on environmental technical standards, regulations on PCBs.

Furthermore, the project launched a successful public outreach campaign (in three years, from October 2011) for public awareness on PCB management through articles in press, radio and TV reports, participation in international seminars for project activities dissemination, preparation of POPs and PCB newsletters, pamphlets and other relevant handbooks.

Also, the web portal “pops.org.vn” and a specific PCB website in both English and Vietnamese have been developed and updated periodically during project implementation to provide general audience with information on PCBs/POPs policies and regulations and technical information and guidelines pertaining to sound PCBs management. The POPs portal and PCBs website have been linked to the VEA website and recently have been upgraded with a number of relevant news in English language for which up to 8 million accesses have been recognized.

ASSESSMENT OF RISK TO DEVELOPMENT OUTCOME

* Risks not anticipated during project preparation:

- The initial design of the project did not include activities related to supporting treatment of PCB (as assessment of treatment technologies, or pilot treatment technology). Therefore,

when the project implemented PCB management activities at the facilities, the facilities and waste generators would like to thoroughly handle or store PCBs on sites instead of long-term storage of PCBs at the sites selected by the project in order to eliminate environmental and regulatory risks soon.

- At the beginning of the project, the facilities repairing transformers which were expected to join the project did no longer manufacture, or involved in business related to transformers and old electrical equipment, so they did not participate in the project. Therefore, the project actively surveyed, sought other facilities and cooperated with hazardous waste treatment and waste oil recycling facilities. The survey, assessment, selection and achievement of the cooperation agreement has prolonged the duration of building PCBs storage warehouses and also affected other activities of the project.
- Difficulties in sampling and inventory of transformer oil: For EVN, many transformers are still being operated in the grids and the large number of samples that needed to be analyzed led to PCBs inventory process delay. For non-EVN facilities, the variety of owner facilities also increased time of PCB inventory. This also affected other activities of the project, such as updating data on management information system, development of national action plan on PCBs management, strengthen inspection of PCB management at the facilities.

* During implementation of the project, the risks mentioned above were mitigated as follows:

- For PCB treatment, authorized management agencies, EVN and the project has encouraged the facilities handling PCBs when they have eligibility; developed next phase project related to treatment of hazardous waste, including PCBs; actively sought for the international partners to transfer PCB treatment technologies to Vietnam.
- For change in the PCB storage sites, the project surveyed, identified and built new PCBs storage warehouses to ensure technical and legal requirements for long-term storage of PCBs.
- For difficulties in PCB sampling and inventory: EVN and MOIT have actively coordinated, enhanced experts, supplemented counterpart resources, shared power cut schedules, sampling and analysis plans, ... and promoted of inventory progress keeping initially expected sample numbers.

In the future, after the project completion, VEA, EVN, MOIT and related agencies also have plans to actively implement measures to ensure the sustainability of the project, and minimize risks, including:

- Continuously promote implementation of regulations and guidelines on sound PCB management and treatment; strengthen inter-sectoral coordination.
- Continuously maintain communication activities, dissemination of information related to the risks caused by POPs/PCBs.
- Combine and promote PCB management and treatment activities in the general activities of hazardous waste management.

ASSESSMENT OF BANK AND BORROWER PERFORMANCE

a) Bank Performance

The Bank - as a Global Environment Facility (GEF) Implementing Agency – has a responsibility to assist its client countries to achieve global environment objectives that are supported by the GEF. The GEF is the interim financial mechanism of the Stockholm Convention. This PCB

Management Project would contribute significantly to achieving the objectives of the corresponding GEF Operational Program for Reducing and Eliminating Releases of Persistent Organic Pollutants. The Bank has technical knowledge on POPs management and experience in the design and implementation of GEF investment projects. The Bank's long-standing and broad involvement in the power sector in Vietnam allowed for synergies to be developed.

The project was designed with the components and activities that are distinct to ensure the feasibility for achieving the goals of the project as well as the disbursement plan. During implementation, the Bank has supported the project on building procurement plan and workplan very actively. Also, the Bank has provided technical support on procurement management, financial management, managing the implementation of the consultancy contracts, especially in the final stages of the project after it was restructured and to ensure project progress.

Through the missions, the Bank and PMUs have monitored the results of the project, provided technical comments, ensuring the process of project accordance to the provisions of the WB and Vietnamese government, and ensure the goals of the project are achieved. Through fieldwork, the Bank has helped to resolve technical issues, reviewed the environmental documents that helped to choose the most suitable locations for the PCB storage sites.

b) Borrower Performance

During the project implementation, the PMUs made efforts in building and completing policy framework on PCB management, prevention and response to emergency incidents, pollution control and health protection. Besides, the PMUs were active in the propaganda, dissemination and awareness-raising for different audiences from the state authorities, the business sector, institute and research centers, universities, the Industrial Management Board and social organizations. The PMUs also directed the implementation of activities to ensure the sustainability of project and developing the plan of activities for the next phase of the project.

For organization, proper arrangements related to PMU members were put in place to enable solving problems during project implementation. The project offices were equipped, the staff had professional and technical capacity necessary to achieve the objectives.

Regarding the method of implementation, the project has shown flexibility during the implementation; for example, mechanisms and policies were developed to meet the actual demand (standards, technical guidance notes, additional to those initially planned). The project has actively arranged personnel, time and financial resources for performing investigations and surveys to choose locations for storing PCBs with many different establishments, from north to south of the country (about 14 sites).

About administration, finance, procurement, in addition to the supervision of the World Bank, all project activities were under the strict control of many government units, the Department of Planning and Finance of VEA, the leadership of the VEA and the Departments of MONRE: the Department of Finance, Department of International Cooperation, the Organization Department and other departments, such as: Hanoi Tax Department, State Treasury, Ministry of Planning and Investment, the Independent Auditor. Through the inspections of these units, financial activities, bidding procurement of project were considered compliant with the provisions of CPVN and donors.

In addition, the project also performed compliance reporting by weekly reports to the PCD, VEA; monthly reports for the ICD and MOST; monthly tax report, quarterly report for the ICD, MOST, Financial Planning Department of the VEA and General Department of Environment, Planning

Department of the MONRE and the Ministry of Natural Resources and Environment; quarterly reports to the World Bank; disbursement reports, annual reports for the ICD and Science and Technology Department, Financial Planning Department of VEA; annual reports to the Planning Department, Ministry of Natural Resources and Environment; the annual audit report, and other reports, including 6-month report to the Ministry of Natural Resources and Environment, Report on the inspection schedule of the World Bank, Ministry of Finance Report (aid certification).

LESSONS LEARNED

Advantages

In terms of implementation, the project was split in 2 PMUs, one under the management of VEA/ISEA, and the other under EVN, which created independence for each party in procurement activities, implementation of EVN and non-EVN inventory and disbursements.

Disadvantages

Regarding reporting mechanism, splitting implementation between 2 PMUs showed advantages, however, the responsibility to submit reports and sharing information was not regulated initially, causing problems with sharing of information, especially information on storage construction, inventory data. In addition, regulations and deadlines for submitting reports were not clear, resulting in delays and efforts in collecting and reviewing data.

Regarding cost norm, the PAD anticipated inflation, fluctuations of market prices, however, as prescribed in PIM, all expenditures had to comply with MOF requirements, which were usually lower than the market price, causing difficulties for disbursement. Besides, going through long periods of development, approval and implementation of the project, cost estimates for some packages of goods, civil works, such as purchasing oil filters, construction of storage/warehouse were lower than real-time prices, causing difficulties to select suppliers while ensuring quality.

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

N/A

Annex 9. List of Supporting Documents

1. Project Concept Note
2. Project Appraisal Document
3. Project Grant Agreement
4. Environmental Impact Assessment
- 5 Country Partnership Strategy (CPS) for Vietnam 2007-2011
6. Country Partnership Strategy (CPS) for Vietnam 2012-2016
7. Aide Memoires for Supervision Missions
8. Implementation Status Reports (ISRs)
9. Mid-Term Review Report
10. Draft National PCB Action Plan, May 2015
11. Project (Restructuring) Paper
14. Project Progress Reports prepared by PMUs
14. Completion Report prepared by PMUs

MAP

I N S E R T

M A P

H E R E

AFTER APPROVAL BY SENIOR GLOBAL PRACTICE DIRECTOR
AN ORIGINAL MAP OBTAINED FROM GSD MAP DESIGN UNIT

SHOULD BE INSERTED

MANUALLY IN HARD COPY

BEFORE SENDING A FINAL ICR TO THE PRINT SHOP.

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