PROJECT BRIEF (8 April 2004)

1. IDENTIFIERS

PROJECT NUMBER:	PIMS 3057
PROJECT NAME:	Demonstration of the Viability and Removal of Barriers that Impede Adoption and Successful Implementation of Available, Non-Combustion Technologies for Destroying Persistent Organic Pollutants (POPs)
PROJECT DURATION:	4 Years[1]
IMPLEMENTING AGENCY:	UNDP
EXECUTING AGENCY:	UNIDO
PRINCIPAL COOPERATING AGENCY:	Environmental Health Fund (EHF)
REQUESTING COUNTRY	**The Philippines**
ELIGIBILITY:	Eligible under para. 9 (a) of the GEF Instrument; Philippine also ratified the Stockholm Convention
GEF PROGRAMMING:	OP#14: Proposed POPs Operational Programme OP#10: Contaminants-Based Operational Programme
CROSS-PROGRAMATIC	OP#8: Water-Body Based Operational Programme
BENEFIT:	POPs Enabling Activities (Globally)

2. SUMMARY

The first phase of the Global Programme to demonstrate the viability of available non-combustion technologies for use in the destruction of obsolete Persistent Organic Pollutants (POPs) stockpiles was approved by the GEF Council in May 2003. Four countries were selected to participate in the Global Programme with Slovakia constituting the focus of the first phase. The second phase of the programme, of which this Project submission is the main focus, will be located in the Philippines. The main objectives of this Project are to demonstrate the viability of available non-combustion technologies to destroy POPs, show how the barriers to the deployment of these technologies may be removed and deploy an immediately available and proven non-combustion technology to the Philippines to destroy 4,547 tonnes of PCB wastes. The Project, in line with the GEF POPs focal area strategic priorities as described in the GEF Business Plan FY04-06, will extend the activities of the first phase by carrying out demonstrations on non-combustion technologies for destroying POPs stockpiles in a developing country environment and meet the Stockholm Convention requirements to ensure the use of Best Available Techniques (BAT) and Best Environmental Practices (BEP).

The motivation for promoting non-combustion technologies arises from the environmental and health concerns related to the use of combustion systems for the destruction of POPs. High technology

[1] The full Programme covers four countries (Slovakia, Philippines, China, and an as yet to be identified African nation). Slovakia and the Philippines have previously been the subject of GEF funding for preparation. Separate preparation request will be required for China and the as yet to be identified African nation. The Philippines is the subject of this Project Brief. China and the as yet to be identified African nation will be the subject for specific additional Project Brief submissions, either singly or in combination, to the GEF Council at a later date. The full Programme is expected to last 6-7 years.

combustion systems equipped with sophisticated air pollution control systems (APS) that can be found in the industrialized countries of Western Europe, Japan and North America, are known to generate significant total releases of unintentional POPs in the form of dioxins and furans which are highly toxic to humans and the environment. These toxic releases accumulate in the fly ash captured by the APS device as well as in the bottom ash collected in the combustion chamber and have to be disposed. Addition of high technology APS devices makes these types of combustion systems viable when operated on a large scale and often involves investments of well over US$ 50 million per unit. Such high investments, coupled with the complex operating procedures make such units unsuitable for many developing countries and economies in transition. Furthermore countries like the Philippines lack capacity to test and monitor dioxin releases except at high cost using foreign vendors, so the assumption of achieving this regulatory value is only hypothetical.

On the other hand, newer, highly effective non-combustion technologies for the destruction of POPs have emerged in recent years and have been commercialized. Some of them have operating characteristics that make them far superior to combustion systems. These non-combustion systems can be operated economically at much lower capacities than the sophisticated incineration systems found in the developed world and many of them are relatively simpler to operate as well. These non-combustion systems are however not yet introduced in developing countries and economies in transition due to a number of barriers.

Assisting eligible countries to implement the Stockholm Convention's provisions on wastes containing POPs will require that relatively large amounts of GEF resources be directed towards the destruction of these wastes. In the majority of cases, this would entail removal and export and incineration in an industrialised country. That option, whilst pragmatic in the short run, would leave GEF recipient countries with no capacity and no long-term sustainable solution to hazardous wastes disposal. As many developing countries are at a stage where they are defining their hazardous wastes management policies and investment needs, the non-combustion programme offers a unique opportunity to utilize some of the GEF resources, that would otherwise be available for POPs wastes destruction abroad, to demonstrate environmentally sustainable alternatives to POPs and other hazardous wastes disposal.

The barriers that have been identified during concept development for the Global Programme and the subsequent project preparation in the Philippines and Slovakia include:

- Lack of information/technical knowledge of non-combustion technologies;
- Limited number of vendors;
- Lack of sufficient infrastructure and need for capacity building;
- Nature of existing regulations and standards/markets; and
- Lack of regime for public policy and institutional infrastructure.

The removal of barriers that currently impede the deployment of non-combustion technologies will enable countries to address POPs destruction needs through the use of technologies that emphasize and result in high destruction efficiency, or DE, a measure that is almost never reported or calculated for incinerators, cement kilns and other combustion technologies because these devices typically fail to achieve high total destruction efficiencies as indicated above. Hence the demonstration of the viability of a non-combustion technology of high DE that operate under conditions not likely to generate unwanted POPs will provide an alternative not only to hazardous waste incinerators of high technology combustion and equipped with sophisticated APS that would be difficult to afford in developing countries and countries with economies in transition but also to other combustion technologies that are unfortunately still applied for hazardous waste disposal in many developing and transition economy countries.

The Programme will demonstrate at the country, regional, and global levels means to overcome an array of barriers to the deployment of non-combustion technologies by giving special emphasis to procedures that facilitate the participation of civil society that will encourage community confidence and support for

proposed destruction and cleanup activities. An important feature of this programme is the recognition that, in all regions and in many countries, groups within civil society often have resisted proposed POPs destruction and cleanup activities using different traditional combustion technologies that have created in many cases significant environmental burdens in developed countries in the past, and in developing countries and countries with economies in transition even today. This resistance has often been a significant barrier to the successful execution of such proposed activities, and will be discussed and addressed in this Programme. Another major barrier is that the incineration industry has a quasi-monopolistic position in the global market, e.g. in Europe, out of 31 facilities engaged in the destruction of PCBs, 29 were incineration-based while only two applied alternative technologies in 1998 (UNEP: Inventory of world-wide PCB destruction capacity).

The STAP/GEF Technical Workshop held in Washington, D.C., 1-3 October 2003 reviewed the emerging, innovative technologies for the destruction and decontamination of POPs. The review shows that these technologies have not yet been diffused into the South East Asian developing countries though their application seems to be successful in Australia and Japan. According to available information there are only a few hazardous waste incineration facilities primarily using cement kilns in the developing countries in the region that meet some international standards, namely in Indonesia, Malaysia and Thailand. However, none of these cement kilns are regulated with respect to PCDD/PCDF releases and therefore they cannot be taken into account as an option for PCBs destruction imported from the Philippines in this project.

The specific Project that is the principal subject of this proposal is located in the Philippines. The Project will address PCBs wastes and equipment, which are identified in the country. The majority of the stockpiles in the Philippines today are contaminated equipment like power and distribution transformers, PCBs capacitors and contaminated synthetic oil. PCBs equipment and wastes are spread around the country, mainly emanating from electricity power generating plants operated by the National Power Corporation (NAPOCOR), electrical distribution transformers and capacitors operated by the Manila Electric Company (MERALCO), the National Transmission Company (TRANSCO) and electrical cooperatives supervised by the National Electrification Administration. PCB equipment are also found in manufacturing industries, the telecommunications sector, Government agencies, hospitals and other types of electrical equipment owners. Large PCBs transformers are also found in special economic zones where local soil contamination is documented. Main owners of PCB equipment and a public-interest NGO have signed a Memorandum of Agreement with the Department of Environment and Natural Resources (DENR) – Environmental Management Bureau concerning close cooperation to define their commitments in the implementation of this Project (see Annex 8).

More specifically, the Project that is the direct subject of this Project Brief will:

- oversee the day-to-day operations of the Non-combustion Demonstration Project in the Philippines and, overall, be responsible for its effective implementation;
- assure effective coordination between and among the different actors including the Implementing Agency (UNDP), Executing Agency (UNIDO), the principal cooperating agency - the Environmental Health Fund (EHF), the Government of the Philippines, the technology vendor, the counterpart entity responsible for the day-to-day destruction operations of the targeted PCB wastes, and Civil Society;
- assure the requisite level of on and off-site training for all personnel related to the Project;
- use international tendering for the technology selection and national bidding for the selection of operating entity and the local transporting company, adapt the technology for selected hazardous wastes other than PCBs and regional diffusion and possible transfer of the technology;

- secure involvement of the Basel Convention, UNEP Chemicals, FAO and others with a view of creating an effective framework for their active participation;
- assure the requisite level of on and off-site training for all personnel related to the Project;
- consider during the project implementation exit strategies for the project, taking into account the final ownership of the hardware and technology, and various possible arrangements between the Government and counterpart entity involved, such as exploring the "buy back" option. In this regard, a business plan with detailed financial and socio economic analysis will be prepared during the appraisal stage which will specify details of the implementation arrangements between the Government and the counterpart entity, the operating costs, work plan as well as the financial projections and capital costs recovery of the demonstration facility;
- ensure that the requisite level of monitoring and evaluation of project results is undertaken and properly disseminated; and
- serve as the principal and day-to-day link to the Global Programme component.

The principal outcomes of this project will be:

- improved capacity for environmentally sound management of POPs;
- transfer of non-combustion POPs destruction technology to the Philippines and destruction of 4,547 tonnes of PCB equipment;
- project effectively monitored, evaluated and disseminated and mechanisms in place to facilitate project replication and sustainability; and
- increased regional cooperation in the implementation of the Stockholm Convention.

3. COSTS AND FINANCING:

		Amount (US$)
GEF	Full Project	4,565,000
	Sub-total	**4,565,000**
Co-financing	Government of Philippines	500,000 (in kind)
	Private Industry/PPDC	6,412,380
	NGO community	100,000 (in kind)
	UNDP	100,000 (in kind)
	UNIDO	650,000 (in kind)
	Sub-total	**7,762,380**
TOTAL PROJECT COST		**12,327,380**

4. BASELINE: US$ 4,000,000

5. GEF OPERATIONAL FOCAL POINT ENDORSEMENT:

Mrs. Elisea G. Gozun — Date: 7 January 2004
Secretary
Department of Environment and Natural Resources
DENR Main Building
Visayas Ave.
Diliman Quezon City 1100
Republic of the Philippines
Phone: (632) 928-0691
Fax: (632) 920-4352
e-mail: secgozun@denr.gov.ph

6. IMPLEMENTING AGENCY CONTACT:

Mr. Andrew Hudson
United Nations Development Programme (UNDP)
DC 1 Building, Rm. DC1
304 E. 45th Street
New York, NY 10017
Phone: (212) 906-6228
Fax : (212) 906-6690
e-mail: andrew.hudson@undp.org

7. EXECUTING AGENCY CONTACT:

Mr. Geoffrey Mariki
United Nations Industrial Development Organization
Chief POPs Unit, Multilateral Environmental Agreements Branch
Programme Development and Technical Cooperation Division
P.O. Box 300
A-1400 Vienna, Austria
Phone: +43 1 26026 3043
Fax: +43 1 26026 6819
e-mail: G.Mariki@unido.org

LIST OF ACRONYMS/ABBREVIATIONS

APR	Annual Project/Programme Report
APS	Air pollution control systems
ASP	Africa Stockpiles Programme
BAT	Best Available Techniques
BCD	Base Catalyzed Dechlorination
BEP	Best Environmental Practices
CBO	Community Based Organization
CEE	Central and Eastern Europe
CCO	Chemical Control Order
CSO	Civil Society Organization
CTA	Chief Technical Adviser
DAO	DENR Administrative Order
DE	Destruction Efficiency
DENR	Department of Environment and Natural Resources
DRE	Destruction Removal Efficiency
EA	Enabling Activity
EHF	Environmental Health Fund
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMB	Environmental Management Bureau
EU	European Union
FAO	Food and Agricultural Organization
GEF	Global Environment Facility
GPCR	Gas Phase Chemical Reduction
IC	Incremental Cost
ICS	International Center for Science and High Technology
IFCS	Intergovernmental Forum on Chemical Safety
INC	Intergovernmental Negotiating Committee
IOMC	Inter-Organizational Programme for the Sound Management of Chemicals
IPEN	International Pesticides Elimination Network
LRTAP	Long Range Transboundary Air Pollution
MERALCO	MANILA Electric Company
M&E	Monitoring and Evaluation
MoA	Memorandum of Agreement
MSP	Medium Size Project
NAPOCOR	National Power Corporation
NEA	National Electrification Administration
NGO	Non-Government Organization
NIMBY	Not in My Backyard
NIP	National Implementation Plan
OECD	Organization for Economic Cooperation and Development
OP	Operational Program
PAC	Programme Advisory Committee
PC	Programme Coordinator
PCB	Polychlorinated Biphenyl
PCU	Project Coordination Unit
PDF	Programme and Project Development Facility
PIR	Project Implementation Review
POPs	Persistent Organic Pollutants

PNOC	Philippine National Oil Company
PPDC	PNOC Petrochemical Development Corporation
PPE	Personal Protection Equipment
PSC	Project Steering Committee
PTS	Persistent Toxic Substances
SCWO	Supercritical Water Oxidation
STAP	Scientific and Technical Advisory Panel
TAG	Technical Advisory Group
TPR	Tri-Partite Review
TRANSCO	National Transmission Corporation
TRBD	Thermal Reduction Batch Processor
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
WB	World Bank
WB-IFC	World Bank – International Finance Corporation
WHO	World Health Organization

1.0 Project Description; Background and Context (Baseline Course of Action)

1.1 *Context/History*

1. At present, most countries with developing economies and economies in transition lack adequate and appropriate technical capacity to properly destroy obsolete stocks of Persistent Organic Pollutants (POPs) and/or to remediate POPs-contaminated environmental reservoirs. In addition, in many countries, there are strong disagreements within civil society in the evaluation of technologies that have been proposed for use in the destruction of POPs stocks and/or in the remediation of POPs-contaminated environmental reservoirs. Because of these disagreements, in many cases, efforts to acquire the technical capacity to destroy obsolete stocks of Persistent Organic Pollutants and/or to remediate POPs-contaminated environmental reservoirs have encountered strong resistance from influential sectors of civil society and this has often impeded or blocked progress.

2. Newer, highly effective technologies for the useful and appropriate environmentally sound destruction of many types of persistent toxic substances, especially POPs, that do not utilize combustion processes, have recently emerged and been commercialized. Some of them have operating characteristics that make them far superior to incinerators. They appear to be capable of performing in ways that avoid problems that have been associated with the expert and public opposition to incinerators and other combustion technologies. These newer technologies can directly destroy POPs that are present in obsolete chemical stockpiles and in contaminated wastes and can be combined with other cleanup technologies to destroy POPs trapped in soils and sediments. A consensus of opinion that is very positively inclined towards these newer, non-combustion POPs destruction technologies is emerging at the international level, but this positive inclination is tempered by the realization that a number of barriers have to be overcome before these technologies can be effectively and competitively deployed.

3. There has been considerable controversy surrounding common destruction/remediation technologies (used on POPs and similar wastes) including combustion technologies (such as dedicated incinerators, retrofitted cement kilns, foundries, industrial boilers and others) and land burial (utilizing various forms of containment technologies). Consequently, in 1997 at the second Forum of the Intergovernmental Forum on Chemical Safety a consensus Report extended an invitation to *"… FAO together with UNEP and other relevant IOMC Participating Organizations to evaluate further technologies alternative to high temperature incineration for the destruction, detoxification and containment of obsolete pesticides and hazardous industrial chemicals*."

4. The controversy about combustion technologies revolves around differing estimates of the actual destruction efficiency (not just destruction and removal efficiency) that will be realized during actual operations and the concern that highly toxic residues (gaseous, liquid and/or solid) will be released to the environment during operations.

5. Total destruction efficiency (DE) is almost never reported or calculated for incinerators, cement kilns and other combustion technologies because these devices typically fail to achieve high total destruction efficiencies. Rather, most regulatory agencies only require a measure of the so-called "*destruction and removal efficiency*" (DRE). This measure only takes into account contaminants that are present in the stack gases (air emissions), but ignores toxic contaminants of concern released as solid and liquid residues (as waste ash and waste water). Modern incinerators achieve high reported DREs by using filters, scrubbers and other stack gas cleaning devices to capture pollutants of concern, remove them from the device's gaseous emissions, and transfer them to solid

waste and/or liquid waste residues. As a result, when only a device's DRE is considered, and when a measure of its total DE is avoided, this encourages the selection and deployment of technologies that transfer contaminants from stack gases into other media (water and ground). The use of DE as a measure, on the other hand, encourages the selection and deployment of technologies that efficiently destroy and eliminate POPs and other organic pollutants.

6. There is also debate over whether operating standards for waste combustion technologies that are in force in many OECD countries (requiring expensive pollution control technologies; sophisticated operations and management personnel; and an efficient and well-resourced regulatory establishment) can realistically be expected to be achieved in many countries with developing economies and economies in transition. The controversy about land burial technologies revolves around differing estimates of the integrity and longevity of the containments and the amount of volatilization and/or leaching of POPs and similar substances that can be expected from the land burial site over the long term.

7. The proposed Project will build on the significant level of Civil Society involvement that has started during the first preparation activity and also on the Australian experience where public policy is to avoid the use of incinerators for the destruction of hazardous wastes and to involve civil society in the approval and the operational oversight of selected destruction technologies. As a result of the Australian experience, groups within Australian civil society that had vigorously opposed incineration and/or land burial of POPs-containing wastes participated in the decisions to utilize these newer technologies, participated in reviews of these technologies, and generally accepted them. The Australian experience resulted in a remarkable level of Civil Society agreement (Government, industry, international, national and community-based NGOs) on the successful deployment of a Non-combustion approach to the destruction of Australia's PCB stockpile, and can be viewed as a model "barriers reduction" effort. Early indications from this Programme show similar promise for achieving strong Civil Society support for the activities that will be undertaken in the participating countries.

8. Full civil society involvement has been practiced during Preparation, and will continue to characterize the work undertaken at the Programme and Project levels. This is considered to be a unique Programme and Project characteristic that is crucial to project success. It will be consistently emphasized and fully documented.

9. The project that is the subject of this Project Brief will make possible the realization of specific elements of the Stockholm Convention (described briefly below). The project will demonstrate and remove barriers to the deployment of alternative, non-combustion POPs destruction technologies that can prevent the formation and release to all media of POPs listed in Annex C of the Convention. More specifically, it will meet the Stockholm Convention call, as noted in Article 5, paragraph C that each Party shall, at a minimum:

"*Promote the development and where it deems appropriate, require the use of substitute or modified materials, products, and processes to prevent the formation and release of chemicals listed in Annex C, taking into consideration the general guidance on prevention and release reduction measures given in Annex C and the guidelines to be adopted by the Conference of the Parties*."

10. The Programme and Project also relate generally and have specific relevance to Part II, Annex A of the Convention. Section (e) of Part II states that Parties "make determined efforts designated to lead to environmentally sound waste management of liquids containing polychlorinated biphenyls and equipment contaminated with polychlorinated biphenyls …".

11. Further, this Project will be consistent with additional text in Annex C, which states:

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

1.2 *The Stockholm Convention on POPs*

12. On May 22, 2001 the Stockholm Convention on POPs was adopted. This Convention has led to a new GEF POPs Draft Operational Programme (OP 14), and the proposed project will serve as a barriers reduction exercise that can help inform future activities mandated or encouraged under the provisions of the Convention when it enters into force.

13. Article 6 of the agreed text addresses the identification and management of POPs wastes. It requires such wastes to be "managed in a manner protective of human health and the environment." Parties must "develop strategies for identifying" stockpiles, products and articles in use, and wastes covered by the treaty, after which they must manage the stockpiles in a "safe, efficient, and environmentally sound manner." The treaty requires that disposal of such wastes be done in such a way that the POP content is "destroyed or irreversibly transformed" so it is no longer a POP, or "otherwise disposed of in an environmentally sound manner when destruction or irreversible transformation does not represent the environmentally preferable option or the persistent organic pollutant content is low."

14. Article 5 addresses unintended byproducts, which are listed in Annex C to the Convention. The listed substances are: dioxins, furans, hexachlorobenzene and PCBs when they are "formed and released unintentionally from anthropogenic sources." Article 5 requires Parties to undertake: "measures to reduce the total releases derived from anthropogenic sources of each of the chemicals listed in Annex C, with the goal of their continuing minimization and where feasible ultimate elimination."

15. When POPs stockpiles are incinerated or otherwise combusted, by-products listed in Annex C are generated as combustion products, or are generated in the stack, following combustion (as the stack gases cool down). This is one reason that non-combustion alternative destruction technologies that can avoid this problem can be seen as being consistent with the language of the Convention.

16. Furthermore, the Convention text seeks minimization, and where feasible, ultimate elimination of the "total releases" of Annex C substances. It does not single out POPs air emissions for primary or exclusive attention. This makes the provisions of the Stockholm Convention quite different from those of the UNECE LRTAP POPs Protocol, and from current regulatory practice in many countries, and it provides another reason that priority consideration should be given to appropriate, non-combustion destruction technologies. (It is also consistent with Annex C of the Convention, Part V, B. Best available techniques [b], which states that priority consideration should be given to alternative processes, techniques or practices that have similar usefulness but which avoid the formation and release of such chemicals.)

17. Since its adoption in 1979, the Convention on Long-range Transboundary Air Pollution (LRTAP) has addressed some of the major environmental problems of the UNECE region. This has been achieved through a process of scientific collaboration and policy negotiation. Since its entry into force in 1983, the Convention has been extended by eight protocols, which identify specific obligations or measures to be taken by the Parties to the Convention. The primary regulatory objective of UNECE LRTAP and many country regulatory regimes is to reduce POPs emissions into the air to an acceptable level, but LRTAP and many presently existing country regulatory regimes do not provide equivalent restrictions on the transfer of by-product POPs from gaseous

waste streams into liquid or to solid waste streams. As a result of this regulatory approach, waste incinerators and other waste combustion devices have often been designed and optimized to meet such regulatory clean air objectives by focusing on controlling air emissions through the use of filters and other flue gas cleaning devices that remove dioxins (and other Annex C pollutants of concern) from stack gases. This approach, however, often tends to transfer these pollutants to other waste streams subject to lesser regulatory controls under many existing regimes. The Stockholm Convention takes a different approach, in that it promotes reduction and elimination of "total releases" to all media: air, land, and water. This should favor destruction technologies that can minimize, and can virtually eliminate releases to all media of POPs and other pollutants of concern.

18. The Philippines is one of the countries with serious interest to adequately address POPs problems with strong public involvement. Lack of adequate alternatives for destruction of POPs (mainly PCBs equipment and wastes) has resulted in problematic management in the country. Lack of proper solutions has led to a focus on export of POPs wastes at very high cost, which is presently the only possible way in the country for proper management of PCBs wastes by the owners. Export prices are frequently more than US$ 10 per kg of PCBs waste, with average prices for export running at over US$ 5 per kg. It is clear that only very dedicated and financially strong companies can pay such disposal costs. Successful demonstration and transfer of a non-combustion technology will significantly contribute to achieving these goals by the virtual elimination of all PCBs stockpiles and materials containing PCBs in Philippines. The Government of the Philippines, recognizing the hazards of inadequate PCBs management in the country, has issued in 2004 the Philippine Chemical Control Order (CCO) for Polychlorinated Biphenyls (shown in Annex 6), which require registration, labeling, safe handling and final ban and phase-out of use or storage of PCBs within 10 years after the effective date of the Order. In coordination with the on-going Enabling Activities for the Stockholm Convention, the Project will assist the Philippines in operationalizing the CCO through ensuring safe handling and environmentally sound storage and destruction of PCBs.

19. The Environmental Impact Assessment (EIA) will have a crucial role for the project implementation and the EIA process needs to be considered at two levels:

- The ***national level***, consistent with the continuing effort of DENR strengthen the implementation of the Environmental Impact Statement (EIS) System following provision of DENR Administrative Order No.37, series of 1996, where generally accepted principles of national environmental impact analysis apply; and
- The broader, ***international level***, an important project consideration as the Project is a demonstration Project aimed eventually at being replicated among as many Stockholm signatory countries as is possible.

20. At the ***national level*** EIA can be defined as the process of identifying, predicting, evaluating and mitigating the environmental, public health and socio-economic effects of development proposals prior to major decisions being taken and commitments made. This general definition is in general conformity with existing Philippine legislation and regulatory standards as they apply to the Philippine EIA process including meaningful public participation and transparent EIS process. The latter is crucially important, as it will lead the social acceptability of the environment impact of the project.

21. The overall objectives of the EIA process is to:

- ensure that environmental, public health and socio-economic considerations are explicitly addressed and incorporated into the development decision-making process;

- anticipate and avoid, minimize or offset the adverse significant biophysical, social and other relevant effects of development proposals;
- to protect the productivity and capacity of natural systems and the ecological processes which maintain their functions; and
- to promote development that is sustainable and optimizes resource use and management opportunities.

22. The Project is based on the assumption that the destruction technology to be deployed in the Philippines is one whose operating system is essentially closed, and does not rely on a combustion procedure to destroy the targeted waste. The technical performance of the selected technology will have to be carefully monitored during the entire period of Project implementation. This monitoring of results will be based on broad civil society participation at national level and the Project will be making ample provision for the requisite level of public involvement in the monitoring of technology efficiency and safety during the life of the Project.

23. Of equal importance to the national level process of EIA will be the ***international level*** consideration mandated by the fact that this is a Global Programme of the GEF. An effective monitoring and evaluation regime is an essential part of the EIA process. Consistent with this requirement the Project must, and has, made substantial provision for the implementation of a truly unique and participatory global monitoring effort for the results of the Philippine component of this Global Programme.

24. Based on extensive consultation with NGOs that have expertise in this field, and on experience in this project to date, it is expected that destruction technologies will most easily win broad acceptance within civil society if, at a minimum, they can demonstrate two important characteristics:

- They operate in systems that are essentially closed. This means that uncontrolled releases of POPs and other substances of concern can be avoided and all residues from the destruction process (gaseous, solid and/or liquid) can be contained, analysed and, if necessary, further processed prior to release. It also means that the technology can avoid the periodic "upsets" that plague incinerators and other open destruction process; and

- They can achieve total destruction efficiencies (DEs) for POPs and other substances of concern that approach 100%. This means that they not only effectively eliminate gaseous, air-emissions of POPs and other toxic pollutants of concern but they also effectively eliminate releases of these pollutants as solid wastes and as liquid wastes. (This approach conforms to the terms of the Stockholm Convention where the obligation is to reduce *"total releases"* to all media with the goal of *"their continuing minimization and where feasible ultimate elimination.")*

25. These two characteristics have been the starting point for stakeholder participants during Preparation and will continue to underlie Civil Society involvement during Full Project Implementation. For purposes of EIA consideration, number two above has particular importance. It is an assumption of the project that destruction of POPs matrices undertaken during Project implementation will approach 100%. But it is not enough to operate theoretically, there must be an effective and funded means to verify that the destruction efficiency being sought by the Project will actually be achieved. For this reason, the Project has been constructed to involve both national and international resources to monitor the results of technology performance, particularly as they relate to national EIA release standards and to the objectives of the Project.

1.3 *Barriers to Deployment of Non-combustion Technologies*

26. Experience gained during Project Preparation has resulted in improved understanding of the barriers to be overcome during Full Project implementation. Barriers to the deployment of non-combustion technologies include:

Lack of Information/Technical Knowledge of Non-combustion Alternatives

27. It was anticipated that the first barrier that would be encountered would be lack of information about Non-combustion alternatives at virtually all levels of Civil Society, including among elected and appointed government officials. This assumption proved correct, but this turned out to be a barrier that has now been overcome in the Philippines. Representatives of the project have found an eagerness to learn about alternative technologies and expressed significant levels of support for their deployment. Both NGOs and government officials pay attention to state of the art in non-combustion technologies and actively participated in expert meetings where different technologies were presented. In summary we have found that this barrier, while pronounced at the inception of preparatory work, has been overcome in the Philippines with resulting, strong support evidenced at all societal levels.

Limited Number of Vendors

28. The initial overall Programme objective was to prepare national demonstration projects in two countries – Slovakia and Philippines – *"to demonstrate the viability of available non-combustion technologies for use in the destruction of obsolete Persistent Organic Pollutant (POPs) stockpiles and the cleanup and remediation of POPs contaminated soils and sediments."* The operative assumption was that successful utilization of these technologies to destroy significant POPs stockpiles in a developing country and country with economy in transition setting would make an important and critical contribution toward the reduction of barriers for the further adoption and effective implementation of these technologies. Experience during the Project PDF-B phase has tended to confirm the validity of the operative assumption, but it has also revealed limitations.

29. The Programme's initial focus was on the technologies themselves, and also on criteria and methodologies that might be used in their evaluation, selection and deployment. It was initially expected that the Programme would identify multiple technologies that are already commercially available; whose vendors are able and willing to competently oversee technology transfer for operation in a developing country and/or a country with an economy in transition; and with a proven track record and a demonstrated ability to satisfy all Project selection criteria relative to the actual POPs stockpiles targeted for destruction taking into account the actual matrices within which the POPs in the targeted stockpiles were embedded.

30. In the end, the Programme was able to identify only a limited number of vendors that might possibly satisfy project selection criteria. These vendors were identified during the PDF-B phase of the project and indicated also during the TAG meetings. The STAP/GEF Technical Workshop on Emerging Innovative Technologies for the Destruction and Decontamination of Obsolete POPs held in Washington DC from 1–3 October 2003 also made recommendations on technology selection. Final selection of the non-combustion technology most suitable to address the specific waste matrices in the Philippines will be selected by an open bidding process during the appraisal process through a PDF-C or supplemental PDF-B facility. The actual award of the tender can however only be effected after the Project Document has been approved and funding secured by UNDP and UNIDO.

31. The bidding process will take place in two phases. The first will be a qualification phase in which technology vendors will be invited to indicate an interest in bidding, and will provide to UNIDO the information and verified data that will be needed to determine whether or not the technology satisfies Project technology selection criteria. This information and data should be based on the operation of a facility technically similar to the one the vendor proposes to supply in the Philippines. It should include verified data including qualitative and quantitative analysis of all residue streams: solid, liquid and gaseous. The vendor should also provide information on the frequency and the consequences of any "upset conditions" that may have occurred during an extended period of commercial operation of a similar facility. The term "upset conditions" should be understood to include instances when the performance of the facility deviated from normal operating conditions. Vendors of technologies identified by the Project TAG as having the potential to satisfy Project criteria should be invited to participate. These are: base catalyzed decomposition, gas phase chemical reduction, and sodium reduction technologies. Vendors of super critical water oxidation (SCWO) technologies might also participate.[2]

32. Information and data received during the qualifications phase will be made available to stakeholder expert participants in the Project TAG so they can review their sufficiency, and can contribute to an evaluation of whether or not the proposed technology satisfies Project selection criteria. If the information and data received is determined to be insufficient, vendors will be given limited time to provide the additional needed information. Every effort will be made for UNIDO and stakeholder experts to reach consensus agreement on matters of both the sufficiency of the information provided, and also, on final determination of qualifications. If consensus cannot be reached, UNIDO will make the final determination, but will do so taking fully into account all valid stakeholder input. This qualification process need not require a face-to-face meeting, but may be carried out by email and/or teleconference. Following completion of the qualification phase, UNIDO will invite formal bids from those vendors whose technologies qualified in the first phase.

Lack of Sufficient Infrastructure and the Need for Capacity Building

33. The Project anticipated that ease or difficulty in successfully deploying alternative technologies that meet Project criteria would depend, to some considerable degree, on a country's pre-existing technological infrastructure and on related considerations of human resource availability. Experiences in preparatory (PDF-B) work revealed many ways in which the constraints imposed by limitations in a country's technical infrastructure and human resources might be considerably greater than what was anticipated. However, preparatory experiences also provided the Project with a more precise understanding of the nature of technological barriers that must be overcome. This new understanding suggests, among other things, a relatively simple strategy that might be utilized to effectively overcome some of the most critical constraints – including some that appeared initially to be almost insurmountable.

34. This new understanding more specifically was the realization that for purposes of cost and operating efficiency it was not only desirable but also essential to co-locate the non-combustion technology with an existing chemical or petrochemical plant, where there already exists the kind of management structure, workforce, and access to the raw materials needed to operate the technologies. Work undertaken during project preparation has resulted in the understanding that a "Greenfield" approach to the construction of a non-combustion destruction facility will not likely be cost competitive with more traditional but less efficient and technically and socially attractive

[2] SCWO technologies were originally identified at the first TAG meeting as having characteristics likely to enable them to satisfy Project technology selection criteria. However, SCWO was rejected at that time because it appeared that no commercial implementation of SCWO was sufficiently mature to be considered "*commercially available*" as the TAG defined this term. A recent technical workshop of STAP/GEF suggests this technology may now be sufficiently mature to be considered commercially available as the Project and its TAG define this term.

alternatives. Under circumstances present in many developing countries, it also appears that in a "Greenfield" deployment, given the relatively small size but technical complexity of the operation, there may be no practical way to establish and maintain a management structure, workforce, and operating procedure that possess sufficient competence to ensure consistent, safe operation. In the case of the Philippines, the Government has identified the PNOC Petroleum Development Corporation - PPDC (a wholly owned subsidiary of the Philippine National Oil Company) as the main counterpart for the Project.

Nature of Existing Regulations and Standards/Markets

35. Regulatory standards for waste destruction technologies were often specifically written with the present generation of incinerators and other combustion devices in mind, and agencies are now often reluctant to write newer and more appropriate standards. For example, a regulation for destruction devices may explicitly require that a specified combustion temperature be achieved and maintained. A non-combustion technology would automatically fail to meet such a regulation.

36. Current regulations in many developed countries focus almost exclusively on gaseous emissions, and tend to be less stringent about the transfer of toxic substances to solid waste (e.g. fly ash and bottom ash that are disposed of in landfills and to water). These regulations also may often tend to underestimate the amount of releases that actually will occur under ordinary, real life operating conditions. In many countries that are signatories to the Stockholm Convention the development of regulatory standards for wastes destruction have yet to be addressed, and thus the Program and Project can serve to help inform the process of establishing standards that take into account such measures as Destruction Efficiency in addressing issues related to POPs.

37. Large construction firms and technology vendors have considerable experience and have already made large investments in incinerator technologies. They are well positioned to transfer these technologies into emerging markets, and can afford to deploy large, experienced, and effective sales forces to achieve this objective. As a result, the incineration industry in Europe has a quasi-monopoly. Out of 31 facilities that are destroying PCBs, 29 facilities were incineration-based and only 2 employed non-combustion technologies (UNEP: Inventory of world-wide PCB destruction capacity, 1998).

38. Companies associated with the newer non-combustion technologies, on the other hand, tend to be young, with smaller sales forces, less political connections and/or the promotional capacity as compared to the well-established and often well-capitalized combustion technology vendors. In addition, they tend to have little or no operating experience under the conditions that prevail in many countries with developing economies and economies in transition.

39. Philippines has taken steps to improve its existing regulations and standards through the issuance of the Philippine Chemical Control Order (CCO) for PCBs, which provides the regulatory framework for environmentally sound management of PCBs. Incineration and imports of PCBs are banned in the Philippines. In the absence of alternative solutions, small quantities of PCB equipment are exported yearly to incineration facilities in Europe at prohibitive costs.

Presence of Non-Technological/Non-Market Barriers

40. While related to the barrier described above, there is another more significant and over-arching barrier that needs to be addressed. This barrier, that might be considered essentially "non-technological" and also "non-market" in nature, was not fully anticipated or fully understood at the time the preparation of the Project Concept Document and PDF B documents.

41. This barrier is not unique to the deployment of appropriate ***non-combustion*** technologies for POPs destruction. It arises in the deployment of ***any*** technology that might be utilized in the cleanup, disposal and/or destruction of toxic wastes, especially under circumstances where this must be carried out in a manner satisfying protective environmental standards (and also protective health and safety standards). Simply put: ***market forces alone, will generally not create sufficient demand to sustain investments in appropriate toxic waste cleanup, disposal and destruction services in the absence of an existing or evolving regime of public policies and related enforcement infrastructures***.

42. A company or agency that operates an adequate and appropriate facility to cleanup, dispose of, and destroy toxic wastes will incur substantial costs including the costs of labor, utilities, supplies and materials, costs associated with the amortization of capital equipment, administrative costs, and so on. Even when the company or agency receives a subsidy, it is unlikely that the subsidy will be sufficient to cover all expenses for any extended period of time. In order to be sustainable, the company or agency must be able to charge a fee for the services it provides that is sufficient to cover its costs and to enable it to at least break even. In other words, it must operate under market or market-like conditions.

43. But the services provided by a hazardous and toxic waste cleanup company (or agency) do not meet any ordinary market demand. They do not, in any direct way, enhance the profitability or the wealth of their client companies or agencies, particularly if their capacities were not fully utilized. Rather, they provide services whose main function is to protect public health and the environment. The client who purchases the services does so primarily to rid itself of a liability. In most cases, this liability is not perceived to exist until and unless it arises as a result of national policies and the expectation of their enforcement. In the absence of such a regulatory regime or in the absence of a concern that inaction may lead to a more costly future liability, companies, and agencies do not generally volunteer to pay, from their own pockets or budgets, the substantial costs associated with high-standard toxic waste disposal services.

44. For example, if a company or agency has toxic wastes on their premises – the easiest and apparently least costly course of action might be to allow the wastes to sit, or possibly to put them in storage, dump them or bury them. This will tend to happen in many developing countries and countries with economies in transition except when there are effective monitoring, enforced laws and regulations requiring some other course of action, and/or when there exists a concern that the wastes pose a potential present or future liability large enough to justify spending money on their disposal.

45. When there exists a concern about a potential present or future liability, the easiest course of action for a company or agency is to seek out a service provider to remove the wastes from their premises. However, when they do so, they will tend to select the least-costly vendor capable of fulfilling their legal obligations and/or removing their liability. In the absence of a licensed and regulated waste treatment industry, and in the absence of appropriate monitored and enforced liability laws, the least-costly waste vendor is likely to be one who hauls the waste off the premises and dumps it in the night (or the equivalent).

46. Even when waste disposal services are licensed and well regulated; a company or agency can still be expected to purchase the least-costly service that satisfies legal and regulatory requirements. Under such circumstances, it will be impossible to establish and sustain a waste disposal facility that can meet highly protective standards if these must compete in the market with cheaper vendors operating approved and licensed facilities that fail to meet the kind of high and protective standards that are required to protect human health and the environment and that are clearly contemplated by the Stockholm Convention.

47. In summary, few if any clients will pay a premium for a superior toxic waste cleanup service if a cheaper alternative exits that eliminates the liability and meets established legal and regulatory standards. One of the main functions of the Project CTA will be to advise the Government on measures and strategies of enforcing the CCO for PCBs and thus assist the country in meeting its obligations under the Stockholm Convention.

Lack of a Regime for Public Policy and Institutional Infrastructure

48. Before a country can deploy, in a sustainable way, appropriate and protective technologies for the cleanup, disposal and/or destruction of toxic wastes, it must already be moving toward establishing ***a regime*** consisting of public policies and an institutional infrastructure such that:

- for each specific stock or instance of certain designated categories of a toxic waste, a responsible party and/or agency can be defined and identified.

- the identified responsible parties and/or agencies have well-defined obligations making it their responsibility to insure that proper cleanup, disposal and/or destruction of the designated toxic wastes occur in a timely manner.

- there exist appropriate and protective standards governing toxic wastes including: responsibility to manage toxic wastes in ways that avoid releases to the environment; clear guidance requiring timely action (cleanup, disposal and/or destruction) aimed at avoiding further dispersal of existing toxic wastes to the environment; and standards governing toxic waste cleanup, disposal and/or destruction activities that are fully protective of health and the environment while avoiding the creation of additional environmental or public health hazards.

- the development of an expectation in society that responsible parties and/or agencies will discharge their obligations with regard to toxic wastes in a timely manner and by means that satisfy established protective standards.

- some sufficient mechanism be put in place that will predictably impose an appropriate penalty (financial, employment, status-based, criminal, and/or other) upon a responsible party or agency that fails to meet its obligation; a penalty more costly than what a company or agency might save by its failure to comply.

- standards governing waste disposal operations – including protective release limit values governing releases of toxic substances of concern to any media – with monitoring and enforcement sufficient to assure that standards are consistently met.

49. If a country does not have a regulatory regime in place more or less similar to the one described above, and if it has not yet committed itself to work toward establishing such a regime, it will then be difficult and might be impossible for it to successfully deploy any appropriate and protective toxic waste treatment technology in a sustainable fashion. *In summary, a critical lesson learned during preparatory work is that the absence of a regime similar to that described above is often the most significant barrier that impedes deployment of appropriate technologies for the cleanup and destruction of POPs wastes and other hazardous wastes. Experiences and strategies aimed at overcoming this barrier are not only critical to the successful and sustainable deployment of appropriate non-combustion waste destruction technologies – they are more generally critical in the establishment of a national regime sufficient to successfully implement the Stockholm Convention.*

50. The Government of the Philippines has taken steps to establish the requisite legal and regulatory structure for the proper management of hazardous wastes including POPs. Within the Department of Environment and Natural Resources, the Environmental Management Bureau (EMB) has been charged with the responsibilities for regulating the management of hazardous wastes including initiating actions for policy and legislative reforms, as well as enforcement of the administrative orders issued by the Department of Environment and Natural Resources. EMB works closely with all stakeholders in putting together the legal and regulatory framework for the management of hazardous wastes, which includes active participation of concerned NGOs. In this regard, Republic Act (RA) 6969 entitled the "Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990" was promulgated to govern the cradle to grave management of PCBs in the Philippines. The Philippines is not a manufacturer of PCBs and importation of electrical equipment and other products containing PCBs are the main source of POPs. Section 25 of the Implementing Rules and Regulations of RA 6969 categorizes PCB as prescribed hazardous wastes with Waste No. L 406. As such any establishment having in storage PCBs in its transformers, capacitors, voltage regulators, etc. for disposal has to register as a hazardous waste generator with EMB/DENR. Moreover, a DENR Administrative Order 28 entitled "Importation of Recyclable Materials Containing Hazardous Materials" was issued in 1994. Under this DAO, the EMB regulates the importation of recyclable materials (i.e. second hand transformer units). However, it is within the mandate of the Philippines Bureau of Customs to track and monitor the second hand equipment that may contain PCB. Furthermore, in response to the Stockholm Convention on POPs, the Government has issued the Chemical Control Order (CCO) for PCBs (DAO No. 1 Series 2004), which governs the national management of PCBs as well as the country's compliance to the Convention. Invoking the legal authority of RA 6969, the CCO includes the gradual phase-out plan, which require registration, labeling, safe handling and final ban and phase-out on use or storage of PCBs 10 years after the effective date of the Order. Promulgation of the CCO for PCBs was effected with the signing of the document by the Government in February 2004.

51. The consideration of the Government to make the very significant commitment to address the broader issue of PCBs equipment and wastes targeted by the Project, and to use its influence to gain the cooperation of the companies that currently own majority of this type of wastes, is concrete evidence that at the end of the Project intervention Philippines will have shown the way on how other Stockholm Convention signatory countries can effectively move to develop the kind of regulatory regime described in this section. One product of the Project will be a Final Report dedicated exclusively to the experience and results the Project has yielded in relation to the development of an appropriate and effective regime. This Final Report will be made available via the Programme/Project dedicated web site and will be distributed to Stockholm signatory countries and others upon request.

1.4 *Technology Selection Process*

52. The GEF approved Project Preparation documents defined criteria to be met as a means of initially screening the range of currently available Non-combustion technologies. The criteria employed during Preparation included limiting consideration of technologies to those that:

- *Operate in systems that are essentially closed. This means that uncontrolled releases of POPs and other substances of concern can be avoided and all residues from the destruction process (gaseous, solid and/or liquid) can be contained, analyzed and, if necessary, further processed prior to release. It also means that the technology can avoid the periodic "upsets" that plague incinerators and other open destruction processes; and*

- *Can achieve total destruction efficiencies (DEs) for POPs and other substances of concern that approach 100%. This means that they not only effectively eliminate gaseous, air-emissions of*

POPs and other toxic pollutants of concern but they also effectively eliminate releases of these pollutants as solid wastes and as liquid wastes.

53. The Technical Advisory Group (TAG) of the Project interpreted these requirements as necessitating consideration of only those technologies that were "commercially available" to mean that the technology had already been successfully operated in a full scale, that is in a commercial or other institutional setting. The TAG also concluded that the technology selected should come with the assurance that the vendor or vendors could provide the "know-how" and support needed to successfully set up and operate the technology under circumstances similar to those that would be identified in the participating countries.

54. On the basis of application of the above criteria and the TAG amplification of those criteria, three technologies were identified for further consideration. These included:

- Gas Phase Chemical Reduction (GPCR);
- Base Catalyzed Dechlorination that is currently referred to as Base Catalyzed Decomposition (BCD); and
- Sodium Reduction Process.

55. The reports of the TAG meetings appear in this document as Annex 5.

56. At this point in the technology selection process the final choice of the appropriate technology would be driven by the nature of the stockpile to be addressed in relation to the comparative advantage of the three technologies identified by the TAG as meeting Project Selection Criteria. The selection process shall also take into account the recommendations of the recent STAP/GEF Technical Workshop on Emerging Innovative Technologies for the Destruction and Decontamination of Obsolete POPs, held in Washington, DC, from 1 to 3 October 2003. Furthermore, based on current technological achievements, the selected technology should have demonstrated Destruction Efficiency of at least 99.9999% for PCB waste matrices of the type found in the Philippines.

57. It is important to note that each additional country participating in the overall Programme (China, and a yet to be designated African country) will undergo separate assessments similar to that undertaken to deploy the most appropriate technology to address the targeted PCB stockpile in Philippines. Ongoing development of the Programme will be driven by the nature of the stockpiles to be addressed in these additional countries, a continuing review of existing and emerging Non-combustion technologies that meet Programme and Project selection criteria, and consultations with the participating countries and other appropriate and necessary interests in the private and public sector. Toward this end, Programme/Project resources have been provided to ensure the continuation of the technology assessment process and will be one of the specific and ongoing responsibilities of the TAG.

1.5 *Global Benefits*

Environmentally Sustainable Economic and Industrial Development

58. Persistent Organic Pollutants (POPs) can injure human health and ecosystems at locations nearby the site from which they escape into the environment and also at very far distant locations from that site and can impact adversely on wildlife, aquatic and marine life, domestic animals and humans. Because of their unique properties, POPs do not respect national boundaries, and therefore pose a special kind of challenge that makes it impossible for any one-nation acting alone to remedy the problems. The implementation of cost-effective and clean, environmentally sound technologies, to be demonstrated in this Project for the destruction of obsolete stockpiles of PCBs and materials

containing PCBs would, if replicated, support environmentally sustainable economic and industrial development in many regions particularly in countries with developing economies and economies in transition. To achieve this global benefit, the EIA should have a crucial and guiding role throughout the project life.

The eruption of Mt. Pinatubo in the Philippines in 1991 was the second largest volcanic eruption of the 20th century in our planet. Hundreds of thousands had to flee their homes and large areas were evacuated. Among others, the Clark Airbase that had large PCBs stockpiles had to be evacuated in a rush and it led a sequence of adverse events that created a major PCBs polluted hot spot. The technology to be demonstrated through this project would in longer term be able to address this hot spot and others. Such a programme would not only ensure the sustainability of the selected non-combustion technology in the country but would prevent the negative impact of PCBs transport from the stockpiles/contaminated sites through air and water.

Global Environment/Conservation of Biological Diversity

59. The rationale of the Stockholm Convention is the long-range transport of PCBs and other POPs. The most important long-range transport vector is air and subsequent deposition at far distant locations and move upwards in the food chain. Ecosystems with the greatest identified harms caused by POPs originating at far distant include: the Artic; the North Sea; the North Atlantic; the Baltic; the Great Lakes; and others. The destruction and cleanup of a significant PCB global hotspot benefits these regions by reducing the amount of POPs available to volatilize into the air. The benefits are to the ecosystem as a whole, and also to people who eat fish or meat from these ecosystems, and especially indigenous people who depend on wild fish and meat.

Recent research, however has further increased our understanding of the global dynamics of POPs and particularly its oceanic biogeochemical control. Air-water exchange has shown to dominate depositional processes to many aquatic systems, most importantly surface ocean layer, for a wide range of POPs including PCBs.It has been shown that phytoplankton uptake of PCBs and air-water exchange behave as coupled processes. Reseach has shown that deposition to the surface ocean layer is the highest in tropical and subtropical latitudes of the northern hemisphere (Dachs et al., Environ.Sci.Technol. 2002, 36, 4229). If the influx of PCBs could be decreased by destructing their stockpiles in the Philippines, it would have a beneficial effect on primary productivity in the regional seas. In other words, in addition to the long range atmospheric transport based on the so called “grasshopper effect”(a sequence of successive volatilization and condensation processes) the POPs have a negative environmental imopact in site by accumulating in phytoplankton and move upward in the food chain. It is not only a theory but could be confirmed by a large survey conducted by Iwate et al. (Environ.Sci.Technol. 1993, 27, 1080) that showed a higher than average peaks of PCBs concentrations in the surface layer of South China Sea and the Philippine Sea.

Improved Water Quality

60. POPs routinely escape from storage sites and from contaminated locations into the wider environment by volatilization, by ground and surface water run-off and by other means. By providing the framework for the destruction and cleanup of obsolete pesticides and hazardous industrial chemicals, the project will therefore contribute in preventing future contamination and threats to the quality of the global hydrological cycle. PCBs have contaminated local waters in the Philippines, and by addressing the PCB stockpile issue in this country, and the additional two countries that will comprise the Programme, water quality that has suffered from PCB leakage and dumping will improve as a result of this Programme and Project intervention.

Stockholm Convention Parties

61. The Stockholm Convention requires appropriate disposal of POPs wastes (Article 6; 1; (d) (ii)); and it calls on the COP (Article 6; 2; (b)) to *"Determine what they consider to be the methods that constitute environmentally sound disposal …"* This demonstration Project, designed to produce information and data that will be valuable to Convention Parties as they determine their own strategies for POPs disposal. It will also provide information and data beneficial to the COP in carrying out its mandate to determine what methods constitutes "environmentally sound" disposal.

Applicable Models

62. Most countries with developing economies and economies in transition lack adequate and appropriate technical capacity to properly destroy obsolete stocks of POPs and/or remediate POPs-contaminated environmental reservoirs. By establishing criteria and guidelines for the identification and selection of appropriate non-combustion technologies as well as planning guidelines for the deployment of these technologies, this project would provide a model for the destruction and remediation of wastes associated with obsolete chemical stocks of POPs. To achieve this objective the proceedings of the STAP Technical Workshop held in Washington, D.C. in 1-3 October 2003, which reviewed the emerging, innovative technologies for the destruction and decontamination of POPs would be an excellent guidance document. After formal ratification of the Stockholm Convention, and as the Parties have developed their National Implementation Plans (through GEF funded Enabling Activities), there will be a need to develop programmes to identify and manage their obsolete POPs stockpiles in an environmentally sound manner.

63. Lessons learned from implementing this project will provide important inputs and guidelines to the COP of the Stockholm Convention on issues related to the deployment of non-combustion POPs destruction technologies in developing countries and economies in transition.

1.5 *Special Features*

Hotspot Cleanup

64. The initial Project to be funded in the Philippines does not address PCBs polluted sites decontamination directly. On the other hand in Special Economic Zones, some contaminated localities e.g. the Clark Airbase, etc., were identified. The non-combustion POPs destruction facility, which will be present in the country, can be used for destruction of PCBs concentrate and as such will increase the potential for site clean-up activities.

Civil Society Involvement

65. Civil Society involvement was a hallmark of Preparation Activity. Repeated consultations with the NGO community have occurred in the Philippines. NGOs participated in meetings of the Technical Working Group set up by the DENR to advise the Government on the CCO. In this context, the same group received briefings and provided inputs to the Project design and strategy including the issue of non-combustion technologies. The NGO community was also an active participant in the TAG meeting held in Manila, the Philippines, in September 2003.

66. Even more extensive Civil Society involvement is planned during implementation of this project proposal. There will be substantial and ongoing country-based Civil Society participation in the Philippines, including arrangements to include elements of Civil Society in project monitoring and evaluation of results. The project makes explicit provision for continuing regional Civil Society

involvement in both the work of the Project and the overall Programme. Further, the Project includes provision for the sponsorship of two Regional Workshops in Asia and other locality, which will be decided later, in year 3 of the Project to disseminate information/results on Non-combustion technologies and destruction activities to date and project lessons learned. Lastly, specific provision will be made for site visits to the demonstration site in Philippines by elements of Civil Society, including representatives of governments from countries of the region and in other global regions, on an ongoing basis. This will not only strengthen the Civil Society participation portion of the Programme and Project but also be beneficial to enhancing replicability and sustainability at regional and global levels (see Output 4 and its related Activities).

Regional Approaches to POPs Stockpile Destruction

67. The Africa Stockpiles Programme has taken a Regional Approach to the elimination of obsolete stockpiles of pesticides on the African continent. A regional approach is also adopted in this Project Brief with a view to develop a programme on environmentally sound management of POPs in Asia and the Pacific including the issue of non-combustion technologies for POPs destruction. As a first step in this direction, the project will develop a close coordination and cooperation with Swiss Government funded and UNIDO executed second phase of the Cleaner Production Programme aiming at destruction of POPs stockpiles in Vietnam.

2.0 Rationale for GEF Intervention

68. In general, the project has been designed in full conformity with GEF policies and programme guidelines. It is built upon a partnership between and among the Implementing and Executing Agencies, the Government, the Private Sector, and enjoys the strong support of Civil Society at local, national, regional, and international levels

69. The proposal is consistent with the draft elements for an operational programme on POPs (Proposed Operational Programme #14 of the GEF), and is aligned with POPs strategic priority No. 3: "Demonstration and promotion of replication of innovative and cost-effective technologies and practices". This Programme emphasizes the need to develop and strengthen country capacity to fulfill its Stockholm Convention obligations through the provision of on-the-ground interventions to implement specific phase-out and disposal measures at national and/or regional level, and includes provision for capacity building. The proposed Programme and Project is consistent with this stated intent of the Proposed OP#14. Additionally, the Programme and this Project are seen to be consistent with para 20, Section C of the Proposed OP#14, which states that projects will be encouraged to "facilitate the environmentally sound disposal of stockpiles of obsolete POPs". This Section further states that assistance will be provided in the identification, containment and stabilization, and environmentally sound destruction of stockpiles, including 'created stockpiles', e.g. PCBs being withdrawn from use. Lastly, the proposal responds to the Proposed OP#14 emphasis on strengthening capacity and infrastructure and institutions at different levels, monitoring, strengthening of enforcement capacity and facilitation of technology transfer.

70. This proposal is also generally consistent with the GEF Operational Strategy of April 1997, especially as described Operational Programme #10 – Contaminant-Based Operational Programme. Philippines, the second participating country, is eligible under Section 9(a) of the GEF Instrument and has ratified the Stockholm Convention.

71. More specifically, a stated objective of the GEF Contaminant-Based Operational Programme is to overcome *existing barriers* to the adoption of best practices. An additional aim of the Contaminants-Based OP is to identify new technologies that could be used to assess and reduce contaminant loading and to prevent the releases of globally significant POPs. Another important

emphasis in any GEF project is to secure full *civil society involvement* in the work associated with GEF projects – affected communities, NGOs, CBOs, the scientific community, and all affected stakeholders. The Project is designed consistent with this emphasis.

3.0 Programme Strategy, Objectives, Outcomes and Activities

Strategy

72. As originally conceived, the Project was a pre-Stockholm Convention Project under OP #10, the Contaminants-Based OP in the International Waters Portfolio of the GEF. Ideally, the project from its very beginning would have involved more countries than the eventual two countries (Slovakia and the Philippines) that have been the subject of Preparation Activities to date. Since the commencement of Preparation Activities, several considerations have led to the conclusion that expansion of the original, limited two- country approach, made necessary in part by the relatively limited resources available under OP #10, would make sense for the following reasons:

- by 10 March 2004 the Stockholm Convention has 151 Signatories and 53 Parties. The Convention will enter into force on 17 May 2004;
- the GEF having been entrusted, on an interim basis, to be the Principal Entity of the Financial Mechanism for the Convention;
- the development of the Operational Programme on POPs (OP# 14);
- the possibility of extending the Programme to two different development regions and thus address existing barriers in a greater number of cultural, geopolitical and socioeconomic settings, and, more specifically;
- take advantage of opportunities created by way of China having explicitly requested an opportunity to participate as a Project country and the expressed desire in the GEF approved Project Brief for the Africa Stockpiles Programme (ASP) to create synergies with the Programme and Project which is the subject of this submission.

73. Stakeholder participation has been a unique and successful feature during Programme/Project Preparation, and will continue to be a major feature of this Full Project in the Philippines.

74. The initial PDF-B called for the establishment of a consultative process among government officials and relevant stakeholders to develop planning process guidelines and secure commitment by government agencies, business groups, and other affected stakeholders to select, deploy, and monitor POPs destruction technologies. This initial process has resulted in multiple consultations in Slovakia and the Philippines regarding the eventual deployment of the most effective and appropriate non-combustion technologies to address the targeted stockpiles. Five consultations involving a broad array of stakeholders have been undertaken in the Philippines.

75. Stakeholder involvement in the Philippines will be included as part of the Environmental Impact Assessment that will be undertaken by the PPDC. The project will also support expanded activities at the regional and global level.

76. As there will be four country-specific demonstration *Projects* in total under the *Programme*, there will be a need for strong coordination of the four project activities for purposes of successful replication and sustainability. This will require that the services of a Global Programme Coordinator who will oversee the Non-combustion Programme. The first phase of the Programme covering Slovakia, included support to Programme activities for a period of two years. An additional period of two years of Programme support is included in this Project Brief for the Philippines to continue the global coordination activities started in the initial phase.

77. In particular, this Project Brief submission will support the *Programme* activities that will:

- ensure continuing development of the Project demonstration activities in the remaining two countries, including development and finalization of Project Briefs, that will be required for Council submission;
- develop detailed rationale for the remaining Project demonstration activities based on, *inter alia*, different socio-economic conditions, new developments in the capacities of possible technologies, different types of POPs wastes, etc.;
- continue to serve as the coordinating entity between and among the four demonstration Projects comprising the overall Non-combustion Programme;
- continue to ensure effective communication between and among the Non-combustion Demonstration Project, and *inter alia,* other Stockholm Convention related Projects and activities such as the Africa Stockpiles Programme (ASP), the UNEP Implemented, UNIDO Executed NGO Capacity Building Medium-Sized Project (MSP), and Enabling Activities (EA) in Asia and Pacific and globally; and
- generally serve as a clearinghouse for information related to Non-combustion technologies and the potential for their deployment to destroy obsolete POPs stockpiles and potentially address continuing, industrially related streams of POPs contaminants.

78. Additional funding for the Programme will be secured from the budgets of additional Project Briefs and PDF-Bs developed and processed during year two of this Project covering China and one African country.

79. The *Project* in the Philippines will:

- oversee the day-to-day operations of the Non-combustion Demonstration Project in the Philippines and, overall, be responsible for its effective implementation;
- assure effective coordination between and among the Implementing and Executing Agencies, the Government of the Philippines, the vendor, the counterpart entity responsible for the day-to-day destruction operations of the targeted stockpile, and Civil Society;
- use international tendering for the technology selection and national bidding for the selection of operating entity and the local shipping company, adapt the technology for selected hazardous wastes other than PCBs and regional diffusion and possible transfer of the technology;
- secure involvement of the Basel Convention, UNEP Chemicals FAO and others with a view of creating an effective framework for their active participation;
- assure the requisite level of on and off-site training for all personnel related to the Project;
- consider during the project implementation exit strategies for the project, taking into account the final ownership of the hardware and technology and various possible arrangements between the Government and counterpart entity involved, such as exploring the "buy-back" option. In this regard, a business plan with detailed financial and socio economic analysis will be prepared during the appraisal stage which will specify details of the implementation arrangements between the Government and the counterpart entity, the operating costs, work plan as well as the financial projections and capital costs recovery of the demonstration facility.
- ensure that the requisite level of monitoring and evaluation of project results is undertaken and properly disseminated; and
- serve as the principal and day-to-day link to the Programme component.

Objectives

Overall Objective of the Programme

80. The Overall Objective of the Programme is to demonstrate the viability, at the Global level, of available non-combustion technologies for use in the destruction of obsolete Persistent Organic Pollutants (POPs), and specifically PCB, in stockpiles and the cleanup of POPs, and specifically PCBs in different matrices including contaminated soils or sediments.

Immediate Objective of the Programme

81. The Programme objective is to demonstrate and remove barriers to the deployment of alternative, non-combustion POPs destruction technologies in several different country settings, in different development regions, recognizing that barriers to deployment will take different forms in differing country, regional, and cultural settings. Deployment in different country and regional settings will also make possible linkages with other GEF supported projects such as the Africa Stockpiles Programme, the GEF (Global) MSP in support of NGO Capacity Building, the Enabling Activities of the countries that will eventually comprise the full non-combustion Programme, and all countries with enabling activities.

Immediate Objective of the Project

82. The Immediate Project objective is to deploy a commercially available, proven non-combustion technology to address a total of 4,547 tonnes of PCBs transformers comprising about 1,350 tonnes of PCB oils and synthetic oils. The Government of the Philippines will continue intensive inventory activities to confirm reported data, and also to develop and operate database of PCBs equipment and wastes, which would cover, among others, PCBs used in electrical equipment, hydraulic systems, cooling systems etc. Identified stockpile as presented in table below shows groups of PCB transformer owners in the country. In addition to this, hundreds of PCBs capacitors were identified during PDF-B missions that are not included in the table below. Inventory of PCBs equipment including capacitors is still ongoing and final figures are expected to be higher than indicate in the table below.

Table 1: Identified stockpile of PCBs equipment in the Philippines

Type of PCBs equipment owners	***Transformers***	
	Out of Service	***In Service***
	In tonnes of total weight	
Distribution companies	559	565
Individual owners	-	346
Commercial buildings	4	72
Industrial Establishments	703	722
Hospitals	16	64
Military Camps	-	3
Government Offices	-	6
Electric Utilities	-	1487
Sub-total	***1282***	***3265***
TOTAL	***4547***	

83. The Project will last four years. The first year will be used for pre-qualification and open bidding for the destruction technology, environmental compliance activities, site preparation and installation of technology unit. Year 2 and 3 are years of operation and the project will assure successful start-up and continuation of work. During the fourth year, documentation, reporting and dissemination of results will be undertaken in addition to continuing operation of the destruction unit.

Outcomes and Activities

Outcome 1: Improved capacity for environmentally sound management of POPs

Activities for Outcome 1: E***stablishment and maintenance of a Project Coordination Unit (PCU), which will be located in the Philippines***

Activity 1.1 Establish and organize an effective Philippines Project Coordination Unit (PCU) and extend appointment of Global Programme Coordinator

Activity 1.2 Recruit the Project Chief Technical Advisor (CTA), national Project Coordinator and Administrative Assistant;

Activity 1.3 Assure cross-GEF and other related Project coordination and communication; and

Activity 1.4 Plan and host a minimum of two (2) Programme Advisory Committee meetings, three (3) meetings of the Project Steering Committee and two (2) Technical Advisory Group meetings.

Outcome 2: Transfer of non-combustion POPs destruction technology to the Philippines and destruction of 4,547 tonnes of PCB equipment

Activities for Outcome 2: Capital Equipment Selection, Purchase, Design, Construction, Testing, Deployment, and successful operation to destroy the waste matrices in the Targeted PCB Stockpile

Activity 2.1 Preparation of detailed Terms of Reference for technology selection, invitation of bids from selected vendors for technology and equipment supply and purchase of capital equipment*;*

Activity 2.2 Undertake activities necessary to meet Philippine Government Environmental Impact Assessment (EIA) requirements;

Activity 2.3 Design, Manufacture, Deployment and Test Operation and Commissioning of the destruction unit in the Philippines;

Activity 2.4 Project Management Supervision (Monitoring) during technology transfer to Philippines including, site preparation and performance tests (with limited chemical analytical sampling and testing). Ensure necessary training of Project operational and managerial personnel and effect technology transfer to Philippines. Prepare Terms of Reference for the operation of the technology and transport of PCB waste to the project site. Invite local bids from selected vendors for taking the responsibilities as operating entity and transport company of PCB wastes.

Activity 2.5 Prepare the site for deployment of the selected technology, including construction of storage facility, the provision of equipment, and availability of utilities, all directly linked to the destruction unit;

Activity 2.6 Provide the managerial, labor force, and make available the raw materials to enable destruction of the targeted stockpile and associated waste matrices in the demonstration area; and

Activity 2.7 Finalize Capital Equipment Transfer arrangements. Prepare Terms of Reference and invite bids for equipment ownership.

Outcome 3: Project effectively monitored, evaluated and disseminated and mechanisms in place to facilitate project replication and sustainability

Activities for Outcome 3: Effective, specific, and documented actions taken to ensure Project Replication and Sustainability (Capacity Building)

Activity 3.1 Develop environmental monitoring protocols including chemical analytical monitoring and a project evaluation framework, and perform preliminary environmental monitoring at the beginning and at the end of the project;

Activity 3.2 Ensure requisite project monitoring and evaluation (in line with GEF, UNDP and UNIDO rules and regulations for M&E) during destruction of the targeted stockpile and associated waste matrices in the demonstration area;

Activity 3.3 Assure continuing and far reaching Civil Society involvement in Project related activities in Philippines, including ensuring Civil Society participation in monitoring and evaluation;

Activity 3.4 Prepare and distribute Project Semi-Annual reports and Final Reports on project activities to Stockholm signatory countries and to others directly and by request. Materials to include, *inter alia*, specific global evaluation of barriers that impede the further utilization of appropriate, non-combustion technologies; a full report and an evaluation of all project related costs; performance and operating data; environmental impacts; safety issues; a final evaluation of civil society input and participation; commercial considerations; the details of any special problems encountered; and specific recommendations on ways the results of the project can be replicated globally. As a first step in this direction, the project will develop a close coordination and cooperation with the Swiss Government funded and UNIDO executed second phase of the Cleaner Production Programme aiming at destruction of POPs stockpiles in Vietnam;

Activity 3.5 Provide technical and other information and assistance on project related information and activities to public and private sector entities;

Activity 3.6 Assure senior level programme and project representation at Stockholm related meetings and other meetings as appropriate and assure effective liaison with related POPs projects such as the Africa Stockpiles Programme; and

Activity 3.7 Create and maintain a dedicated Project Web Site.

Outcome 4: ***Increased regional cooperation in implementation of Stockholm Convention***

Activities for Outcome 4: Development of a regional approach for POPs management with full civil society involvement

Activity 4.1 Develop a regional approach to the use of non-combustion technologies;

Activity 4.2 Assure continuing Civil Society presence at regional level;

Activity 4.3 Organize and implement two Regional Workshops for NGOs and civil society (Asia and other region) in year 3 of the Project to disseminate information/results on Non-combustion technologies and destruction activities to date and project lessons learned;

Activity 4.4 Continue assessment of additional and emerging technologies that meet project selection criteria and submit findings to regional workshops and STAP;

Activity 4.5 Prepare and distribute Technology Operational Manuals to other interested Stockholm Convention signatory countries.

4.0 Risks, Sustainability and Commitment

4.1 Possible Risks

84. The four principal Risks that need to be taken into account for this Programme and Project include:

- The possibility that the non-combustion technology will not perform consistent with its design specifications and expectations;
- The Programme and Project will not be sustainable for financial and other reasons beyond the life of the GEF intervention;
- The possibility of inadequate or ineffective Stakeholder participation; and
- The possibility of a negative environmental impact analysis.

85. One of the Technology Selection Criteria employed during Preparation was that of considering only those Non-combustion alternative technologies that had been demonstrated to deliver high DE and to be commercially available. It was recognized that for each technology type different support to customers is offered. It is evident that with inadequate technology vendor support the destruction unit could fail to reach projected parameters. Given the broad range of documentation available on the performance of each short-listed technology, the risk that the technology will perform at less than its designed capacity is seen as moderate.

86. Of more significant concern is the issue of sustainability. Given the descriptions that appear below in relation to the sustainability issue in Philippines, at all levels including the financial level, the risk of the Project not being sustainable is seen as low.

87. The financial sustainability of the project rests with the assumption that the destruction unit will be able to operate competitively in an open market with alternate destruction technologies including export for incineration beyond the life of the project. The Government has made a firm commitment not to license incineration facilities within the Philippines. The projected cost to be charged to waste owners for PCB destruction is about US$3,500 per tonne (the exact cost will depend on the selected technology which can only be determined after the bidding process, but the projected cost takes into account both the operating costs and the equipment purchase). Waste owners in the Philippines are currently paying an average of US$ 5,000 per tonne for PCB destruction through export for incineration. Therefore, as long as the destruction cost offered by the non-combustion unit remains lower than the export alternative, waste owners will continue to utilize the facility and thus ensure its long-term financial sustainability. A business plan to be elaborated at the project appraisal stage will provide details of the anticipated financial performance of the unit. The risk that the cost charged to the waste owners will be higher than the cost of export for incineration is considered low based on expert estimates on operating costs and the fact that the most cost effective non-combustion technology in the Philippine context meeting project selection criteria will be deployed.

88. The STAP Review of the Programme pointed out the possibility that the individual country Projects could be jeopardized by a negative environmental impact analysis. This is a valid concern and one that has been actively engaged during project preparation. The technology that is to be deployed and the performance of which will be the core of the environmental impact assessment must operate essentially in a closed system. The risk, therefore, of a negative EIA is seen as extremely low.

4.2 Sustainability and Commitment

89. Project sustainability and commitment will be assured through the use of:

- the creation of Partnerships between and among the national government, the state owned entities, the private sector and Civil Society;
- significant Private Sector Investment;
- country driven framework for a legislative and regulatory regime consistent with the provisions of the Stockholm Convention, the Basel Convention;
- strong Civil Society participation and advocacy at the national, regional and global levels;
- strong linkages with GEF and other related Stockholm Convention Projects and activities such as the ASP, EA at national, regional and global levels; and
- evidence of continuing, profitable deployment of the capital equipment beyond the life of the GEF Project intervention.

90. The Project delineates clearly the strong level of *Partnership* between and amongst the GEF, the Government of the Philippines, the private sector through the investment at the PPDC/PNOC site, and Civil Society. Strong evidence of this can be found in all Project Outputs. The extent and significance of *Private Sector Investment* will be further described in the Financial Sustainability segment below. During the PDF-B phase Memorandum of Agreement (MoA) was signed between DENR and PCBs equipment and waste owners. Final MoA is presented in Annex 8. Letters of co-finance confirmation are included in Annex 9.

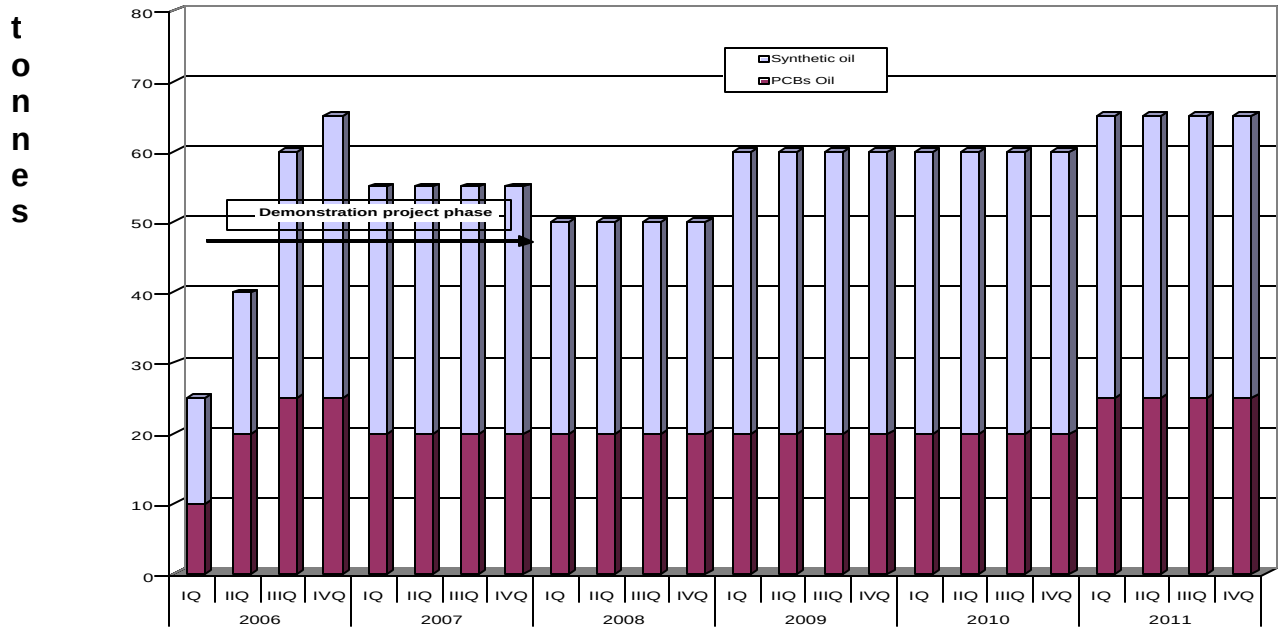
91. The Project makes generous provision for strong, continuing Civil Society participation in Project implementation activities and builds upon the strong support for the Programme and the Project that was created during Preparation. Evidence of the continuing commitment to strong *Civil Society Participation and Advocacy* in Project activities, an essential ingredient to strengthening community level support and thus sustainability for the Objectives of the Programme and the Project, can be found throughout the Activities in Output 4. Strong linkages to other projects will ensure best efforts to generate replicability of project results in other countries. The recently approved Project Brief for the Africa Stockpiles Programme makes repeated references to the need to take into account results of the Non-combustion Demonstration Programme and Programme management will ensure that these linkages will be established and nurtured. Evidence to support the *Financial Sustainability* of the Project will be expanded in the Financial Sustainability section below.

Financial Sustainability

92. In addition to the GEF investment for the deployment of Non-combustion capital equipment to Philippines, the Government of Philippines in partnership with PPDC/PNOC and a private sector entity that will be selected to operate the destruction unit will commit over US$ 6,912,380 to the designated targeted stockpile of PCBs equipment and the associated waste matrices in the Philippines. Already the Government has confirmed co-financing of US$ 500,000 to be provided in kind to facilitate various activities of the project. PPDC has committed over US$ 2.512 million from its own resources and US$ 3.9 million in partnership with a private sector entity (Annex 9). PPDC will invite bids from private sector entities at the time of full project implementation for the right to operate the facility on PPDC premises on a commercial basis. The private sector entity will be required to meet all operating costs and recover its investment through the business operations. The requisite business plan will be prepared for this purpose after the technology has been selected and the private sector entity identified. Below is an indicative graph of the timeframes how the selected technology will likely be deployed in Philippines during and beyond the life of the demonstration project. The graph shows projected destruction of PCBs oil and synthetic oil contaminated by PCBs, which roughly represent 30 % of total weight of PCBs stockpile identified up to date. Approximately 1,350 tonnes of contaminated PCB oil should be destroyed. From this

amount 50% is immediately available and the remainder represents equipment in use. Projection of the destruction is done for years 2006 – 2011. It is expected that 2011 will be the deadline for use and storage of PCBs equipment and wastes in the Philippines. The proposed capacity of the destruction unit is 300 tonnes per year.

The PCBs inventory in the Philippines has been changed during the preparatory phases of the subject project. It is a reasonable fact that can be experienced in any other country during the preparation of their inventories. An increasing PCBs inventory has also been experienced in Slovakia. The original concept was that the demonstration project should destruct at least 1,000 tonnes of PCB-contaminated oil from transformers. However, based on the early experiences gained in Slovakia, financial sustainability of the operations in the demonstration project can be only achieved if the total existing PCBs stockpile would be eliminated. In light of this the total tonnage to be destructed during demonstration phase is 1,350 tonnes. The baseline scenario is clarified to include some 800 tonnes of PCBs equipment in the four-year demonstration phase as an average of 200 tonnes are exported each year. The total current inventory is 4,547 tonnes. As no one can be expected to give precise costs calculation and analysis of the equipment and operating costs before commencing the project, the exact current costs for destruction of the PCBs stockpiles can only be determined after final technology selection. But the final costs analysis can be done only after the completion of the demonstration project. The demonstration project aims at the comparison of the costs of applying a selected non-combustion technology to those of the traditional hazardous waste incineration, as the findings of the STAP technical workshop show the investment and operating costs experienced in the industrialized countries cannot be applied directly in a developing country or an economy in transition. As the operating capacity of the equipment to be selected in the Philippines is 300 tonnes per year contrary to the higher capacity equipment in Slovakia (1,000 tonnes per year) the costs, though not linearly, are lower and in line with the STAP technical workshop review that gives a bottom line estimate of US$ 5 million for the construction of a pilot plant. This figure is at least one magnitude lower than the costs of the smallest but still financially viable hazardous waste incinerator of one kiln.



Graph No. 1: Projected destruction of the stockpile in Philippines

Table 2: Amounts of PCBs oil to be destroyed in the unit in years 2006-2011

Total amount		2006				2007				2008				2009				2010				2011			
		IQ	IIQ	IIIQ	IVQ	IQ	IIQ	IIIQ	IVQ	IQ	IIQ	IIIQ	IVQ	IQ	IIQ	IIIQ	IVQ	IQ	IIQ	IIIQ	IVQ	IQ	IIQ	IIIQ	IVQ
500	**PCBs Oil**	10	20	25	25	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	25	25	25	25
850	**Synthetic oil**	15	20	35	40	35	35	35	35	30	30	30	30	40	40	40	40	40	40	40	40	40	40	40	40
					190				**220**				**200**				**240**				**240**				**260**
1350																									
	percentage of capacity used				**63 %**				**73 %**				**67 %**				**80 %**				**80 %**				**87 %**

93. As can be seen in the graph, the capital investment will, based on the identified stockpile to date, be sustainable for six years. Its sustainability is enhanced by the fact that PPDC/PNOC, in partnership with the Government, will be assuring a flow of PCBs wastes and contaminated materials to the destruction unit over the period. The MoA between DENR and the main owners of PCB transformers has been signed committing the latter to participation in the project. Details of costs to be charged to the waste suppliers will be worked out during the project appraisal. The current average cost paid by the waste owners for incineration in Europe is about US$ 5 per kg of PCB equipment. To ensure sustainability, the destruction cost per ton for various alternative technologies will be compared with a view to selecting the technology which is most cost effective while meeting all other technology selection criteria as defined by the TAG and recommended by the STAP/GEF workshop. This cost must also be lower than the cost of export for incineration to ensure that the waste owners will continue to utilize the facility. Beyond the planned period of operation, PPDC/PNOC could be looking to utilize the plant for continued PCBs and general POPs and the destruction of persistent toxic substances on the basis of bidding for the capital equipment. At this time there is a prohibition on the import of POPs into the Philippines. However, efforts underway in the Inventory Process as part of the Philippine Enabling Activity has already been able to identify substantial amount of PCBs waste and equipment. It is expected that this stockpile will continue to grow. In short, all evidence points to the long-term financial sustainability of this Project on condition that the costs charged to the waste owners remains competitive.

94. In summary, the project will put in place a technology with the capacity to destroy hundreds of tonnes of PCB and other POPs contaminated product. At the end of the demonstration project, data and information obtained would make it possible to project the destruction costs at any given time to achieve long-term sustainability. Furthermore, the cost-effectiveness of the GEF investment is assured considering that with an investment of US$ 4.565 million to destroy 4,547 tonnes of PCB equipment, the average cost of US$ 1,004 per tonne is well below the current average cost of export to Europe for incineration which stands at US$ 5,000 per tonne. In addition, the potential of diffusing the technology in the region provides an additional positive element to the cost-effectiveness of the project and lowering the risk of GEF grant financing.

5.0 Stakeholder Participation and Project Implementation / Institutional Framework / National and Regional Institutions

5.1 *Stakeholder Participation/Preparation*

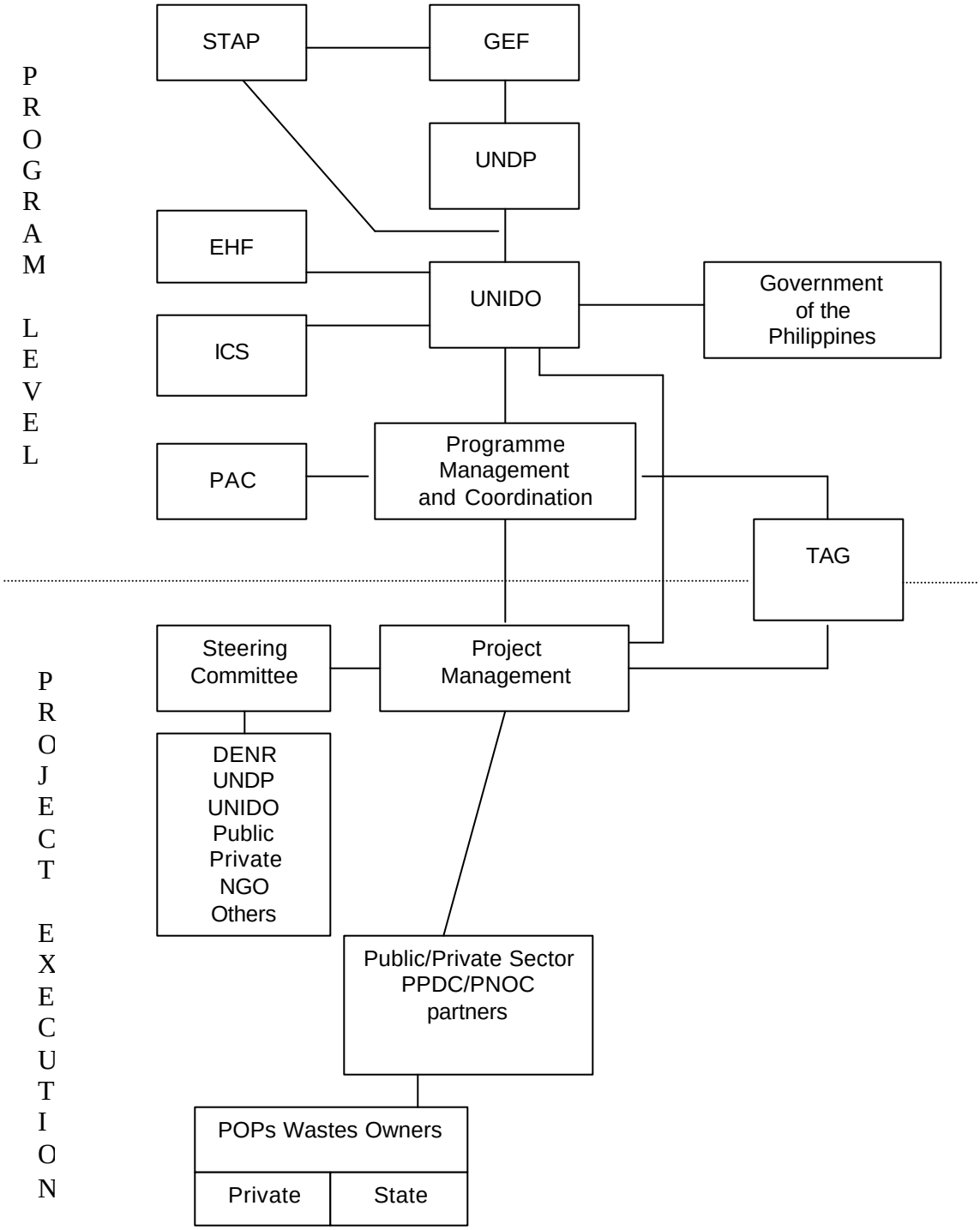
95. Stakeholder participation has been a unique and successful feature during Project Preparation, and will continue to be a major feature of the Full Project. The Project will stress participation within Philippines, and will also sponsor regional workshops to disseminate project information and results of the destruction activity in the Philippines.

96. The initial PDF-B called for the establishment of a consultative process among government officials and relevant stakeholders to develop planning process guidelines and secure commitment by government agencies, business groups, and other affected stakeholders to select, deploy, and monitor POPs destruction technologies. This initial process has resulted in multiple consultations in the Philippines regarding the eventual deployment of the most effective and appropriate non-combustion technology to address the targeted stockpile. Five consultations involving a broad array of stakeholders have been undertaken in the Philippines, and the development of process guidelines is now well underway.

5.2 *Programme and Project Implementation*

97. The implementation arrangements will be as shown in the following organizational chart.

ORGANIZATIONAL CHART



98. The *UNDP* will be the Implementing Agency for the Programme and the Project. The UNDP has and will continue to use its comparative advantage in capacity building, employ its country offices to assist in the critical function of coordinating the array of Civil Society and other stakeholder activities envisaged in the project and already implemented in the preparation (PDF-B) phase.

99. *UNIDO* will continue as the Executing Agency. UNIDO is well positioned to act as an effective executor of project activities based on its comparative advantages in this area. At its 1997 Forum II meeting, IFCS "invited the United Nations Industrial Development Organization (UNIDO) to consider carrying out pilot projects". UNIDO directly accessed PDF-B funds consistent with its role as a GEF Executing Agency with Expanded Opportunities by virtue, of its comparative advantage in the POPs area. Although the GEF Council at its meeting in November 2003 granted UNIDO direct access to GEF resources, both UNIDO and UNDP have agreed to continue their collaboration in this Project as both agencies collaborated in the preparatory work done at the PDF-B stage.

100. UNIDO has accumulated significant knowledge in the pesticide sector as well as in its Cleaner Production Programme. Issues related to the unintentionally generated by-products such as dioxins and furans have also been addressed specifically, more importantly in the Pulp and Paper sector.

101. Finally, through the Pure and Applied Chemistry Programme of UNIDO International Centre for Science and High Technology (ICS), Trieste, Italy, has been involved jointly with UNECE in the preparation of a Compendium of Soil Clean-up Technologies and Soil Remediation Companies (2nd edition, 2000), which compendium also covers technologies for the elimination of POPs. The representative of ICS is a member of TAG. Lastly, UNIDO has assumed responsibility for implementation of a significant number of POPs Enabling Activities globally, and these Enabling Activities, given that they all will have to address the destruction of POPs stockpiles, will have direct linkage to the proposed project.

102. The *Environmental Health Fund (EHF)* will serve as a principal cooperating Agency for specific elements of the Project and the Programme. In this role the EHF will continue to serve as a clearing-house and coordinating mechanism for involvement of the NGO community in both the Programme and individual Projects. The EHF has already contributed substantially to project development during PDF-B implementation. During Project Preparation EHF was instrumental in securing broad Civil Society involvement in, and generating support for, the objectives and activities of the proposed Project, and is willing to continue in that role during Full Project implementation. The role of EHF will be the subject of an MOU to be concluded between UNIDO and EHF that will provide details of services that the latter will undertake in support of the Programme and Project.

103. The Programme will receive oversight and policy direction from a Programme Advisory Committee (PAC), for example the burden of selection of appropriate technology(ies) will be shared with the relevant international agencies that will be members of the PAC. The PAC will initially be comprised of eleven members, and meet not less than twice during the duration of this Project. More specifically, members of the PAC will include a representative from the Philippine Government, a representative from the Slovakia Government, a representative of the Implementing Agency (UNDP), a representative of the executing agency (UNIDO), one member from the EHF, a Civil Society representative, and one representative each from the UNEP Chemicals, the World Bank, FAO, the Basel Convention. The Programme Coordinator will serve on the PAC ex-officio, as will the Project CTA. The PAC will meet at regular intervals during Project implementation and will be called upon as necessary by the Programme Coordinator, in consultation with UNDP and

UNIDO, for policy advice and direction. The PAC may at any time act to increase its membership, as it deems necessary. The PAC will be instrumental in assuring, among other things, necessary linkages between and among related projects both within and outside of the GEF.

104. There will also be Project Steering Committee (PSC) for the Philippines project. The PSC shall meet at least three (3) times during Project implementation, and may be convened as necessary at the call of the Programme Coordinator in consultation with UNIDO, UNDP-Philippines and the Project CTA. The PSC shall be initially comprised of eight members. They will include a representative from the Philippine Government, a representative of PPDC/PNOC, and one member each from the Implementing and Executing Agencies, one member from the Environmental Health Fund, and one member chosen to represent Civil Society interests in Philippines. The Programme Coordinator and Project CTA will be *ex-officio* members of the PSC. The general function of the PSC will be to monitor overall progress during Philippines Project implementation, make recommendations regarding ways in which the Project could be more effectively implemented, identify lessons learned, problems encountered, and generally assist the Programme Coordinator and CTA on any and all matters related to implementation of the Demonstration Activity in the Philippines. The PSC may also at any time act to increase its membership, as it deems necessary.

105. Finally, there will be a *Technical Advisory Group (TAG)* continuing its role from the PDF-B project. The TAG will also meet at least two (2) times during Project implementation. The TAG will undertake an advisory role in service of the work of the Programme and Project, most specifically as an advisory body to the PAC and the PSC. The TAG will meet at the call of the Programme Coordinator in consultation with the Implementing and Executing agencies and the Project CTAs. Meetings may be held at specific locations or may be convened through teleconferencing as deemed appropriate and necessary. The TAG will serve as a primary vehicle for the continuation of non-combustion technology assessment, as a reviewer of the technical aspects of the Project during implementation, and in general as an Advisor to the Programme and Project on all matters of a scientific and technical nature. The TAG will be comprised of one member of the Implementing Agency, one member from the Executing Agency, one member from the EHF and scientific and technical expertise as deemed necessary, drawing from resources such as the GEF STAP, FAO, World Bank, UNEP and UNIDO ICS. One representative of each participating country of the Programme will also be member of the TAG.

6.0 Incremental Costs and Project Financing

106. The total cost of the Project in this submission is **US$ 12,327,380.** The GEF contribution to the portion of the Programme and the Philippine Project that is the subject of this proposal is **US$ 4,565,000**. The total (substitutional) baseline is **US$ 4,000,000** that represents continuation of the status quo whereby an average of 200 tonnes of PCB equipment is exported every year. Over the 4-year period of the project, about 800 tonnes would be exported in the absence of the project. At the current cost of US$5000 per tonne for exporting PCB equipment for incineration in Europe, this works out to a total of US$ 4,000,000 in 4 years. Programme and Project co-finance amounts to **US$ 7,762,380**. Of this amount US$ 3,900,000 is cash from the operating revenue of the destruction unit generated by a selected private sector entity, US$ 2,512,380 contribution from PNOC/PPDC for land (including site development), environmental impact assessment, infrastructure, office space and personnel, and in-kind contributions from the Government of Philippines (US$ 500,000), NGO community (US$ 100,000), UNIDO (US$650,000) and the UNDP (US$ 100,000). A summary Incremental Cost Table appears below. The full Incremental Cost Table can be found in Annex 1 of this Project proposal.

Table 3: Summary Incremental Cost Table (in US$)

Component	Baseline	Alternative	GEF	Co-finance	Increment
Programme	0	1,130,000	800,000	330,000	1,130,000
Equipment & Operating costs	4,000,000	9,787,380	2,995,000	6,792,380	9,787,380
Replication	0	810,000	435,000	375,000	810,000
Regional approach	0	600,000	335,000	265,000	600,000
Total	**4,000,000**	**12,327,380**	**4,565,000**	**7,762,380**	**12,327,380**

7.0 Monitoring and Evaluation

107. Programme and Project Objectives, Outcomes and Activities and information and data about technology performance will be evaluated not less than annually by the PCU. All elements of the Program and Project will also be the subject of the various evaluation mechanisms of the Implementing Agency, the UNDP, and the Executing Agency, UNIDO. This will include the combined Annual Project/Programme Report/Project Implementation Review (APR/PIR), the Tri-Partite Review (TPR), and an external Evaluation and Final Report prior to the end of the second Project in Philippines. The monitoring and evaluation schedule is shown in Annex 2A.

108. Particular emphasis will be given to Civil Society participation in the technical and other aspects of Program and Project monitoring and evaluation (see Activity 3.2). All stakeholders will be given access to the data on destruction efficiency (DE) that is collected in real time, and elements of Civil Society will be invited to directly observe the real time evaluation of DE as well as participate directly in the formulation of the planned development of the necessary monitoring protocols and evaluation framework (see Activity 3.1).

109. The mid-point Project Review (which would occur after actual stockpile destruction has commenced) would focus on destruction performance and efficiency, and would emphasize identification for dissemination of lessons learned from Programme and Project experience to date, including lessons about project design, implementation and overall management both at the Project and Programme levels. The final evaluation would focus on similar issues but will give strong emphasis to the potential for Project impact beyond the initial set of demonstration countries. Recommendations for follow-on activities would be included in each of these review processes.

110. As important as the undertaking of effective and thorough Monitoring and Evaluation will be for the Programme and Project, the effective communication of the results of these activities is equally important. This will be accomplished by making certain that ongoing M&E results are included on the agendas of planned workshops and also posted an a regular basis on the Programme and project dedicated Web site (see Activities 3.3 through 3.7).

8.0 Lessons Learned

111. The main lessons learned during project and programme preparation relate to the barriers to deployment of non-combustion technologies as detailed in section 1.3 of this Project Brief. These have been taken into account in the formulation of this Project Brief and will be further highlighted during project appraisal.

PROJECT BUDGET

Component	*Sub-component*	Amount in US$						
		Republic of the Philippines	**GEF**	**Private Industry**	**NGO**	**UNDP**	**UNIDO**	**TOTAL**
1. Improved capacity for Program and Project Co-ordination	1.1 Effective Program and Project co-ordination and support		200,000			25,000	130,000	355,000
	1.2 Recruit and hire Project CTA, National Project Coordinator and Administrative Assistant		350,000					350,000
	1.3 Assure Cross GEF and other related Project coordination and communication		100,000		10,000	20,000	120,000	250,000
	1.4 Plan and Host a minimum of two (2) Programme Advisory Committee Meetings, three (3) Project Steering Committee Meetings, and two (2) Technical Advisory Group meetings		150,000		5,000	10,000	10,000	175,000
Subtotal			***800,000***		***15,000***	***55,000***	***260,000***	***1,130,000***
2. Capital Equipment Purchase, Deployment and operation to address the targeted stockpile	2.1 Preparation of detailed Terms of Reference for technology selection. Invitation of bids from selected vendors for technology and equipment and Capital equipment purchase.		2,400,000				50,000	2,450,000
	2.2 Activities necessary to meet Environmental Impact Requirements and other legal and environmental compliance activities	80,000	150,000	100,000	5,000		10,000	345,000
	2.3 Deployment, and Certify Operation of the Destruction Unit in Philippines	100,000	100,000				10,000	210,000
	2.4 Project Management Supervision, site preparation and performance tests. Training of Project Personnel and Technology Transfer Costs	45,000	120,000		5,000		50,000	220,000
	2.5 Site Preparation and storage facilities		200,000	2,412,380			5,000	2,617,380
	2.6 Underwriting of Operational Costs to Destroy Targeted Stockpile during Demonstration Phase including capital investment recovery			3,900,000			5,000	3,905,000

Component	*Sub-component*	**Amount in US$**						
		Republic of the Philippines	**GEF**	**Private Industry**	**NGO**	**UNDP**	**UNIDO**	**TOTAL**
	2.7 Finalize Capital Equipment Transfer arrangements	5,000	25,000			5,000	5,000	40,000
Subtotal		***230,000***	***2,995,000***	***6,412,380***	***10,000***	***5,000***	***135,000***	***9,787,380***
3. Effective, Specific actions to ensure Project Replication and Sustainability	3.1 Develop monitoring protocols and project evaluation framework	50,000	75,000		5,000		5,000	135,000
	3.2 Monitoring and Evaluation (Standard IA Practice) during Destruction (Project Implementation) Phase	55,000	50,000		5,000	5,000	5,000	120,000
	3.3 Assure continuing Civil Society involvement in Project activities in the Philippines, including a presence in Monitoring and Evaluation	30,000	90,000		15,000		10,000	145,000
	3.4 Prepare and distribute Project Semi-Annual reports and Final Reports on project activities	20,000	40,000		5,000		5,000	70,000
	3.5 Provide technical and other information and assistance to public and private sector entities	45,000	35,000			5,000	15,000	100,000
	3.6 Assure senior level Project representation at Stockholm Convention meetings and other relevant for a	30,000	90,000				15,000	135,000
	3.7. Create and maintain a project web site	40,000	55,000			5,000	*5,000*	105,000
Subtotal		***270,000***	***435,000***		***30,000***	***15,000***	***60,000***	***810,000***
4. Regional approach	4.1 Develop a Regional Approach to the use of non-combustion technologies.		70,000		10,000	10,000	110,000	200,000
	4.2 Assure continuing Civil Society involvement in the regional level.		75,000		10,000	10,000	10,000	105.000
	4.3 Organize and implement two (2) Regional Workshops to disseminate information on non-combustion technologies and share lessons learned and assure continuing Civil Society participation at the global level.		100,000		5,000	5,000	*25,000*	135,000

Component	*Sub-component*	**Amount in US$**						
		Republic of the Philippines	**GEF**	**Private Industry**	**NGO**	**UNDP**	**UNIDO**	**TOTAL**
	4.4 Continue assessment of additional and emerging technologies that meet Project Selection Criteria and submit findings to regional workshops and STAPs.		50,000		20,000		25,000	95,000
	4.5 Prepare and distribute Operational Manuals to other interested Stockholm Convention Signatory countries.		40,000				25,000	65,000
Subtotal			***335,000***		***45,000***	***25,000***	***195,000***	***600,000***
GRAND TOTAL		**500,000**	**4,565,000**	**6,412,380**	**100,000**	**100,000**	**650,000**	**12,327,380**

List of Mandatory Annexes

Annex 1	Incremental Cost Analysis
Annex 2	Logical Framework (LogFrame)
Annex 2A	Monitoring and Evaluation Schedule
Annex 3	GEF Operational Focal Point Endorsement
Annex 3A	Explanatory note to the endorsement letter
Annex 3B	Philippine Ratification of the Stockholm Convention - Senate Resolution No. 106
Annex 4	Response to External Reviews

List of Optional Annexes

Annex 5	Minutes of the 1st and 2nd Technical Advisory Group Meetings
Annex 6	Philippine Chemical Control Order for PCBs (DAO No. 1 Series 2004)
Annex 7	DENR Administrative Order No. 29 Series 1992
Annex 8	Memorandum of Agreement between DENR and stakeholders
Annex 9	Co-finance confirmation letters