UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Project of the Governments of Vietnam

Project number:	GF/VIE/08/XXX
GEFSEC ID:	3011
Project title:	Introduction of BAT and BEP methodology to demonstrate reduction or elimination of unintentionally produced persistent organic pollutants (UP-POPs) releases from the industry in Vietnam
Thematic area code	FG50 CE17 – Stockholm Convention
Starting date:	June 2008
Duration:	2 years
Project site:	Hanoi, Vietnam
Government	Ministry of Natural Resources and Environment
Co-ordinating agency:	
Counterpart:	Vietnam Environmental Protection Agency (VEPA)
Executing agency/ cooperating agency:	VEPA
Project Inputs:	
- UNIDO inputs:	$ 40,000 (in-kind)
- Support costs (10%):	$ 75,000
- Counterpart inputs:	
- GEF	$ 800,000 (including PPG of $50,000)
- Government of Vietnam (Ministry of Industry, MONRE/ VEPA	$ 1,555,000
- Grand Total:	**$ 2,395,000 (excl. support costs)**

Brief description: By becoming a party to the Stockholm Convention from its beginning, Vietnam has demonstrated that the reduction or elimination of POPs releases is a respective national priority and that it is committed to take appropriate actions. Since 1993, Vietnam has paid close attention to the management of POPs and other toxic chemicals. The Government has adopted a series of legal documents on prohibition of the production and use of all POPs pesticides in Vietnam. DDT and Lindane have been officially prohibited since 1993. All nine of the POPs pesticides covered by the Stockholm Convention have now been prohibited from use. PCBs are only imported and used under strict conditions pursuant to the regulations of the Ministry of Industry (MOI). Vietnam has, with the financial assistance from GEF, studied the POPs situation in the country and elaborated a National Implementation Plan (NIP) detailing the legislative, management as well as technical needs for reducing and eliminating POPs. The action plan section of the NIP details priority areas to be tackled by 2020. According to the Action Plan, Vietnam is to apply BAT and promote BEP in new sources in priority (Part II of Annex C of the Stockholm Convention) source categories by 16 May 2008, and complete dioxin release reduction demonstrations in selected existing sources in the priority sectors by 2010. The sector-wide introduction of BAT/BEP is planned to be completed by 2020.

Approved:

	Signature:	Date:	Name and title:
On behalf of **the Government of Vietnam**	_____	_____	_____
On behalf of **UNIDO:**	_____	_____	_____

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LIST OF ABBREVIATIONS

APR	Annual Project Report
BAT	Best available techniques
BEP	Best environmental practices
CTA	Chief Technical Advisor
DDT	1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane
DANIDA	Danish International Development Agency
GDP	Gross Domestic Product
GEF	Global Environment Facility
HCB	Hexachlorobenzene
HRGC	High Resolution Gas Chromatography
HRMS	High Resolution Mass Spectroscopy
INEST	Institute of Environmental Science and Technology
IR	Inception Report
IUCN	International Union for Conservation of Nature and Natural Resources
ISO	International Organization for Standardization
LRMS	Low Resolution Mass Spectrometry
M&E	Monitoring and evaluation
MOH	Ministry of Health
MOI	Ministry of Industry
MONRE	Ministry of Natural Resources and Environment
MSP	Medium-size project
NEA	National executing agency
NGO	Non-Governmental Organization
NIP	National Implementation Plan
NTA	National Technical Advisor
OCPs	Organochlorine pesticides
PAH	Polycylic aromatic hydrocarbon
PCBs	Polychlorinated biphenyls
PCDD/PCDF	Polychlorinated dibenzo-p-dioxins and dibenzofurans
PIR	Project Implementation Review
PMT	Project Management Team
POPs	Persistent organic pollutants
PSC	Project Steering Committee
PPER	Project Performance and Evaluation Review
PRTR	Pollutant release and transfer register
SEMLA	Strengthening Environmental Management and Land Administration
SC	Stockholm Convention
TEQ	Toxic equivalent
TOR	Terms of Reference

TR	Terminal review
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research
UP-POPs	Unintentionally produced POPs
VEPA	Vietnam Environmental Protection Agency
VNCPC	Vietnam National Cleaner Production Centre
VOC	Volatile organic compound
WB	The World Bank
WHO	World Health Organization

SECTION A. CONTEXT

A.1 CONTEXT/HISTORY

1. The strategy proposed by the National Implementation Plan (NIP), sectoral Action Plan, and this proposed Medium-sized Project (MSP) for the industrial source categories that have the potential for comparatively high formation and release of polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDDs/PCDFs), hexachlorobenzene (HCB) and polychlorinated biphenyls (PCBs) to the environment (Part II: Source categories, Annex C of the Stockholm Convention) includes efficient operation of combustion technologies, thermal and chemical processes, supported by necessary capacity building and regulatory framework strengthening consistent with best available techniques and best environmental practices (BAT/BEP) guidelines and guidance. This planned approach also accommodates Vietnam's obligations under the Stockholm Convention to start reducing about 25% of PCDDs/PCDFs releases currently attributed to these source categories.

2. It is predicted that the annual average economic growth rate in the period of 2001-2010 will be about 7.0-7.2%, with agriculture-forestry-fishery growth of 3.5-4.0%, industry-construction by 10-10.5% and services increasing by 6.0-6.5%. Economic planning envisages that by 2010, Gross Domestic Product (GDP) per capita will be US$ 860. Vietnam is changing its economic structure to enhance competitiveness and adaptability within the international situation, with the increase in industries and services contribution, and the decrease in agriculture-forestry-fisheries contribution. In the process of industrialization and modernization, Vietnam has been facing many challenges on the way towards sustainable development. One of the most serious environmental problems currently faced by Vietnam is air pollution. Industrial emissions, coal combustion and increasing number of motor vehicles using fossil fuel are main causes of loss of air quality in urban and industrial areas. Overall exposures to particulates, CO, CO2, SO2 and NOx exceed permissible levels at many urban locations. The situation needs the implementation of the National Strategic Plan for pollution reduction by introducing BAT/BEP measures and the project reducing unintentionally produced POPs (UP-POPs) should be one part of these activities.

3. UP-POPs (PCDDs/PCDFs, HCB and PCBs) are among the POPs chemicals listed in the Stockholm Convention that have demonstrated chronic adverse effects on human health and the environment. UP-POPs are formed in a wide range of industrial processes and in incineration processes and released into the air, water sediments and solids. In most facilities in Vietnam there are very limited of off-gas and wastewater treatment. In addition, there is a lack of facilities and responsible entities to treat and dispose of hazardous wastes. This gap has led factories to dispose of hazardous wastes in unsafe ways, either by mixing it with non-hazardous waste and storing it on site, or just dumping or releasing it. Most industrial hazardous waste from larger industries is either treated onsite by simple furnaces or industrial boilers, or by specialized small private enterprises, which recycle part of the wastes and use locally made and cheap combustion technology or simple burning at low temperature, giving the favorable conditions for the formation and emissions of UP-POPs and other toxic pollutants.

4. Based on the preliminary UP-POPs inventory, it can be concluded that there are a wide range of UP-POPs sources in Vietnam without control measures and no BAT/BEP experience and knowledge in respect to UP-POPs reduction. This in combination with the fast development of industry can lead to increased releases of environmental pollution (including UP-POPs) threatening the Vietnamese environment and human health if no appropriate countermeasures would be taken.

5. Chronic impairment to human health through exposure to POPs and other pollutants and contamination of the environment has direct implications to national and international efforts to meet sustainable development targets in human health and indirectly impacts efforts to reduce poverty and improve attainment of educational opportunities. Studies on UP-POPs indicate that eliminating them can lead to reduction in the environmental degradation rate and in the long-term, reduce its harmful and dangerous influence on health both to the present and future

generations. Such an approach has prompted the international action that resulted in the adoption of the Stockholm Convention on POPs. The actions proposed here relate directly to UP-POPs listed in Annex C, Part II of the Convention.

6. The rationale of the proposed MSP originated from the needs identified during the inventory process conducted in the course of the NIP preparation, priorities and key objectives established by the NIP.

7. Priority areas identified in the NIP include the stack emission sampling and other industrial release sampling and analysis of PCDD/PCDFs, which is a prerequisite for guiding of BAT/BEP projects and for evaluating BAT/BEP implementation (Priority # 8).

8. While several institutes in Vietnam have already acquired up-to-date analytical equipment for PCDD/PCDF analysis (two laboratories with HRGC/HRMS and one laboratory with LRMS equipment), a gaps analysis undertaken during the NIP development process revealed that Vietnam lacks institutional as well as technical capacity for the sampling and monitoring of PCDD/PCDF stack air emissions and other release vectors from industrial sources.

9. As the implementation of the pilot projects will have to be accompanied and guided by PCDD/PCDF release data, the MSP seeks to address the above-mentioned shortcomings by establishing reliable PCDD/PCDF air emission sampling and monitoring capacity.

10. This will also be important for the successful implementation of the following two other projects on the environmentally sound management of POPs currently developed in Vietnam:
    - Building capacity to eliminate POPs pesticides stockpiles in Vietnam (GEF UNDP Project)
    - PCB Management and Disposal Demonstration Project (GEF-World Bank Project)

    Since it is likely that these projects will use incineration or co-incineration technologies for the final disposal of PCBs and POP pesticides, there is a need to monitor stack gas emissions of these facilities to exclude the unintentional formation and releases of PCDD/PCDFs into the environment.

11. At the same time that analytical laboratories in Vietnam hold up-to-date analytical equipment, the gaps analysis showed that most of the facilities lack international accreditation as well as institutional and human resource capacity to perform PCDD/PCDF analysis in compliance with international standards. Therefore, the proposed MSP aims at implementing activities focusing on the education of personnel for extraction, clean up and analysis of different matrices, accreditation (ISO17025 for PCDD/PCDF) and the participation in international intercalibration studies.

12. From 2004 to 2006, Vietnam participated in the study “Background Air Monitoring of Persistent Organic Pollutants in East Asian Countries” that was a part of the POPs Monitoring Project in East Asian Countries, 2006. The study supported by the Ministry of Environment of Japan was a contribution to the UNEP-led Effectiveness Evaluation of the Stockholm Convention and was submitted to the third meeting of the Conference of the Parties to the Convention in 2007. Its aim was to provide comparable and scientifically sound data on the media considered to be essential (i.e. air deposition), and contributing to further operationalizing the global monitoring programme. However, the study faced several technical difficulties and measured ambient air concentrations of all POPs, except PCBs and PCDD/PCDFs, at a single site in Tam Dao, about 50 km north of Hanoi.

13. Given the different focus of the study in terms of POPs chemicals and environmental matrices covered, Vietnam yet has to build capacity for the monitoring of PCDD/PCDF and other unintentionally generated POPs releases from industrial sources, which will be a key priority for the implementation of the proposed project.

14. While there are currently no activities under the Stockholm Convention Effectiveness Evaluation programme in Vietnam, all information gathered as well as experiences gained on the sampling and monitoring of PCDD/PCDFs during the implementation of the proposed MSP will be shared with UNEP and the Secretariat of the Stockholm Convention.

15. Furthermore, the project will support the National Strategy on Pollution Control in respect to monitoring as mentioned in the NIP, which is to "Develop and complete monitoring network following the national plan for environmental monitoring. In the coming year prioritize on setting up monitoring centers and monitoring points at critical economic zones. Link information between the monitoring centers and monitoring points with the national network."

16. Their implementation will permit the country to have a better planning to meet compliance with its obligations under the Stockholm Convention on POPs, and through this to contribute to the improvement of the environmental situation in Vietnam and in the South-East Asia region where Vietnam is among the fastest growing economies, and eventually reduce and eliminate UP-POPs pollution burden to human health. The introduction of BAT/BEP strategies will be the key approach of Vietnam to reduce and eliminate UP-POPs and other pollutant releases to the environment that will also result in the measurable regional and global environmental benefits.

17. In May 2001, the Stockholm Convention on Persistent Organic Pollutants (POPs) was adopted with the aim of protecting human health and the environment from POPs. The GEF became the principal financial mechanism by the decision of the Conference of Parties (COP). In October 2002, the GEF Assembly approved the addition of POPs as a new GEF focal area, and in November 2003, the GEF Council approved a GEF Operational Program on POPs – OP 14.

18. Article 13.2 of the Convention provides that developing countries Parties and Parties with economies in transition will have access to new and additional financial resources to enable them to meet the agreed full incremental costs of implementing measures that fulfill their Convention obligations. Therefore, insofar as a Party is obliged to require best available techniques under the well-defined circumstances specified in the Convention, the Party should receive access to the agreed full incremental costs of implementing this obligation.

19. Article 5 of the Stockholm Convention addresses measures that Parties shall take measures to reduce releases of unintentionally produced POPs listed in Part I Annex C with the goal of their continuing minimization and, where feasible, ultimate elimination. Part II of this Annex is a list of source categories that "have the potential for comparatively high formation and release of these chemicals to the environment."

20. For the new sources listed in Part II — which includes any new or any substantially modified facility — Parties are required to use best available techniques. This requirement is to be "phased in as soon as practicable but no later than four years after entry into force of the Convention for the Party." The Convention was entered into force to Vietnam on 22 July 2002. Considering that the Stockholm Convention entered into force on 17 May 2004, all new industrial sources listed in Part II of Annex C of the Convention will be required to adopt BAT/BEP not later than 16 May 2008. Furthermore, in all existing facilities prior to the former date, Vietnam is required under the Convention to promote BATs and BEPs in due course. The timeline confirms that the MSP proposal is very appropriate and timely.

21. The implementation of the Stockholm Convention in Vietnam has been planned and is progressing in close coordination with the national strategies on development and environment. More specifically, and in the context of the environment, Vietnam has made significant progress in implementing the "National Strategy on Environmental Protection until 2010 and towards 2020".

A.2 Problem statement (a preliminary gap analysis)

22. PCDD/PCDF are closely related to the production and use of chlorinated pesticides (like 2,4,5-T or PCP)[1] and industrial chemicals (like PCB)[2]. The preliminary Vietnamese PCDD/PCDF

[1] Weber R, Masunaga S. PCDD/PCDF Contamination from historical pesticide use and production – a case study using data frm Japan and Germany (2005). 8th HCH and Pesticide Forum Sofia May 2005, Abstract book http://www.ihpa.info/library_access.php

[2] Takasuga T. et al, Chemical Characterization of PCB, PCDD and PCDF in Technical Kanechlor PCB Formulations in Japan (2005). Arch. Environ. Contam. Toxicol. 49, 385–395.

inventory list about 500g TEQ annually (which does not include the Vietnam war legacies). Furthermore one major risk for destruction projects of POPs stockpiles and other chlorinated organics is the formation and release of PCDD/PCDF and other UP-POPs[3]. Up to now Vietnam has no monitoring capacity to evaluate potential emissions. Without the establishment of a reliable dioxin monitoring (sampling and analysis), these activities cannot be planned nor conducted in the country. Also the results of the POPs destruction pilot studies can be questioned without the evaluation of PCDD/PCDF releases.

23. The establishment of the PCDD/PCDF inventory has been facing difficulties due to lack of basic knowledge in the chemistry and environmental fate of UP-POPs. Additionally the assessment of incineration technologies and the technologies of other relevant industrial facilities has severe faults indicating a lack of expertise in the respective technology sectors and in BAT/BEP. Although the Vietnamese government has been endeavoring to establish a legal and institutional framework for sound management of chemicals and hazardous wastes, including POPs, there are still shortcomings that need to be addressed. The weaknesses and limitations in institutional capacity relating to policy and regulations are obvious. One key issue is the lack of proper coordination among the various government agencies and private sectors on their activities related to UP-POPs. This hampers data gathering and information exchange.

24. It is indicated that monitoring activities and institutional capacity buildings are major needs to ensure a good environmental management. Lack of transfer of BAT/BEP, weak monitoring capacity, lack of scientific and technical investigations are key barriers to the implementation of the necessary prevention and control measures for reducing pollution.

25. During the project preparation phase several gaps have been identified that the Project is faced and that will need to be addressed to ensure its successful implementation and the achievement of project objectives. These include:

- Widening gap between the rapid industrial development and the status of pollution prevention and control infrastructure that is lagging behind.
- Current disposal and treatment practices to eliminate POPs pesticides and PCBs pose an unacceptable burden to human health and environment by generating UP-POPs.
- Establishment of the PCDDs/PCDFs inventory has been facing difficulties due to lack of basic knowledge in chemistry, persistence, bio-accumulation and potential long-range environmental transport of PCDDs/PCDFs.
- Assessment of incineration technologies and technologies of other relevant industrial facilities has severe faults indicating a lack of experience and expertise in the respective technologies in the context of BAT/BEP.
- Lack of proper coordination among the various government agencies and private sector in their activities related to UP-POPs that hampers data gathering and information exchange.
- Lack of BAT/BEP transfer, weak monitoring capacity (particularly sampling capacity), lack of scientific and technical investigations are key barriers to the implementation of the necessary control measures for reducing pollution.
- Inadequate policy and regulatory framework for control of hazardous chemicals in general and POPs in particular.
- Existing laws and regulations are too general and may be impractical in some cases, and there is a lack of detailed rules to support their implementation.
- Enforcement of laws and regulations is particularly insufficient in the medium-and small-scale enterprises (MSE) sector.

[3] Weber R., Relevance of PCDD/PCDF formation for the evaluation of POPs destruction technologies – Review on current status and assessment gaps (2007) *Chemosphere*, In Press, *Available online 4 January 2007*

On the above gaps some more details are given as follows:

26. With rapid economic development, environmental pollution (including UP-POPs pollution), if not controlled, can be the major drawback by burdening environment, destroying eco-systems and threatening human health with the risk to finally hamper, slow down and eventually stop economic development. This is particularly true in Vietnam with high annual industrial growth rate (ca. 10%) and intensive agricultural activities on which a large part of the population relies. Therefore it is crucially important for sustainable development of Vietnam to reduce the impact on environment from the different pollutants and to implement pollution prevention and control measures in industry.

27. Though there has been significant progress achieved in implementing the "National Strategy on Environmental Protection until 2010 and towards 2020" to tackle the pollution from industrial sources it is still at its early stage to adequately address all pollution release vectors such as air, water sediments and solids.

a) **Solid wastes** – Hazardous and chemical wastes: Although Vietnamese government has been endeavoring to establish a legal and institutional framework for sound management of hazardous and chemical wastes, including POPs, there are still shortcomings that need to be addressed. The UP-POPs released on solids (according to the inventory about 600g TEQ annually) are not managed and can therefore directly contaminate land or if landfilled can further impact the environment due to the improper landfilling practice in Vietnam.

b) **Air pollution**: The overall exposures to particulates, CO, CO2, SO2 and NOx exceed permissible levels at many urban and industrial locations in Vietnam. Main contributors are industrial emissions, combustion sources and the increasing numbers of vehicles that heavily impacting the air quality. The estimated total UP-POPs releases to air in the inventory are more than 800g TEQ annually with the potential to considerably increase with industrial development if appropriate measures, in particular BAT/BEP measures would not taken. Up to now very limited control measures on UP-POPs emissions have been taken and there are no regulations in place.

c) **Water pollution**: Lack of water treatment makes water contamination poses a major health threat in Vietnam. Aquatic and marine eco-systems are also threatened by the high amounts of untreated sewage and industrial wastewater generated in urban centers. The most of the industry in Vietnam is located near to the rivers or the sea. Around 90% of the enterprises do not have any wastewater treatment system and most of the older industrial zones do not have central wastewater treatment plant. Industrial wastewater is only treated superficially, and then discharged directly into surface water sources, causing heavy pollution in aquatic and marine eco-systems of Vietnam.

28. Although water is not a major release vector for UP-POPs, they are of concern for some industries (e.g. pulp and paper, textile and leather) and need to be addressed. A second concern related to UP-POPs and water is the management and lifecycle of sewage sludge. It was discovered in industrial countries that POPs including PCDDs/PCDFs, PCBs, HCB and other contaminants are impacting sewage sludge as a pollution sink and depending on the management of sewage sludge can contaminate agricultural fields and the more soluble contaminants the ground and drinking water. Since sewage sludge in Vietnam is often directly released from the water treatment plants and used in some cases in agriculture, the lifecycle of sewage sludge contaminants is important at least for risk assessment and need to be monitored and possibly managed.

29. Recent studies in South East Asian countries (including Vietnam) have revealed that the environment around dump sides/landfills and also people living in the vicinity are impacted by PCDDs/PCDFs and PCBs[4,5].

[4] Minh N. H. et al. (2003) Open Dumping Site in Asian Developing Countries: A Potential Source of Polychlorinated Dibenzo-*p*-dioxins and Polychlorinated Dibenzofurans. Env. Sci & Technol. 37, 1493-1502.

[5] T. Kunisue et al. Dioxins and Related Compounds in Human Breast Milk Collected Around Open Dumping Sites in Asian Developing Countries: Bovine Milk as a Potential Source (2004). Arch. Environ. Contam. Toxicol. 47, 414–426

30. One key task of the Stockholm Convention implementation is the destruction of PCB wastes and POPs pesticide stockpiles. In recent years some pilot projects on pesticide destruction were performed (2001-2003) in different locations in Vietnam and some major project are at the planning phase. However, disposal of POPs pesticides faces many challenges. In comparison to the large amounts of PCB wastes, the volume of POPs pesticides stockpiles is smaller, but they are scattered across many localities in the country. Therefore selecting an appropriate treatment site in each locality and transportation of pesticides to that site is problematic. The movement of pesticides from site to site is strongly opposed by the public, and budgets for collection and disposal are often insufficient.

31. PCDDs/PCDFs are closely related to the production and use of chlorinated pesticides (like 2,4,5-T or PCP)[6] and industrial chemicals (like PCBs)[7]. The preliminary Vietnamese PCDDs/PCDFs inventory list about 500g TEQ annually (which does not include the Vietnam war legacies). Furthermore one major risk for destruction projects of POPs stockpiles and other chlorinated organics is the formation and release of PCDDs/PCDFs and other UP-POPs[8]. Up to now Vietnam has no monitoring capacity to evaluate potential emissions. Without the establishment of a reliable dioxin monitoring (sampling and analysis), these activities cannot be planned nor conducted in the country. Also the results of the POPs destruction pilot studies can be questioned without the evaluation of PCDDs/PCDFs releases.

32. The establishment of the PCDDs/PCDFs inventory has been facing difficulties due to lack of basic knowledge in the chemistry and environmental fate of UP-POPs. Additionally the assessment of incineration technologies and the technologies of other relevant industrial facilities has severe faults indicating a lack of expertise in the respective technology sectors and in BAT/BEP. Although the Vietnamese government has been endeavoring to establish a legal and institutional framework for sound management of chemicals and hazardous wastes, including POPs, there are still shortcomings that need to be addressed. The weaknesses and limitations in institutional capacity relating to policy and regulations are obvious. One key issue is the lack of proper coordination among the various government agencies and private sectors on their activities related to UP-POPs. This hampers data gathering and information exchange.

33. It should be noted that the required analytical capacity is available in Vietnam therefore capacity building activities for sampling and monitoring of PCDDs/PCDFs are the major needs to be focused in order to ensure a good environmental management. Lack of transfer of BAT/BEP, weak monitoring capacity, lack of scientific and technical investigations are key barriers to the implementation of the necessary prevention and control measures for reducing pollution.

A.3 Rationale for GEF intervention

34. The GEF intervention is justified as follows:

- The expansion and modernization of the Vietnamese economy and industry in particular is occurring in rapid pace within a short transition period and there are gaps in the institutional capacity to effectively design and implement adequate pollution prevention and control. The introduction of pollution abatement and management system has not kept pace with this expansion. External intervention is justified on the basis that these gaps cannot be bridged organically.
- The absence of effective pollution prevention and control and management systems affecting significant segment of the Vietnamese industry sector is of international concern.
- The application of BAT/BEP involves the prior hazard identification and environmental impact assessment and the application of appropriate technologies to address the

[6] Weber R, Masunaga S. PCDD/PCDF Contamination from historical pesticide use and production – a case study using data frm Japan and Germany (2005). 8th HCH and Pesticide Forum Sofia May 2005, Abstract book http://www.ihpa.info/library_access.php

[7] Takasuga T. et al, Chemical Characterization of PCB, PCDD and PCDF in Technical Kanechlor PCB Formulations in Japan (2005). Arch. Environ. Contam. Toxicol. 49, 385–395.

[8] Weber R., Relevance of PCDD/PCDF formation for the evaluation of POPs destruction technologies – Review on current status and assessment gaps (2007) *Chemosphere*, In Press, *Available online 4 January 2007*

identified issues in their social, geographical, economic and cultural contexts. The operation of BAT/BEP facilities requires the application of regulatory controls including feasibility assessments, planning permits, environmental impact assessments and operating licenses.

- The project will demonstrate the pollution prevention and control measures in an integrated way and provide a basis for confidence generation among local decision makers receiving technology transfer. The project in this way provides some defense against technology dumping.

SECTION B. REASONS FOR UNIDO ASSISTANCE

35. UNIDO is committed to assist its developing country Member States in accordance with Article 12 of the Stockholm Convention. The GEF has approved Enabling Activities proposals submitted by UNIDO for more than 40 countries, including China and India that have opted to undertake the NIP development through the GEF full project cycle. In addition, UNIDO is executing or developing a range of demonstration and capacity building projects geared to support Convention implementation in a wide range of developing countries and countries with economies in transition. UNIDO has made considerable effort to build this assistance programme. This commitment is based on a clear understanding that these activities are compatible with UNIDO's mandate and corporate strategy and will lead towards the Millennium Development Goals.

36. Conscious that the Conference of Parties of Stockholm Convention requested the Secretariat and urged parties and other donors to initiate activities to promote guidelines on BAT and BAP of regional, subregional and national levels, UNIDO has been requested by the Government of Vietnam to develop and formulate this MSP. The Conference of Parties also invited parties to provide to the Secretariat comments on their experience in implementing the revised draft guidelines on BAT and provisional guidance on BEP. The outcomes of this MSP will provide a useful contribution to further develop the revised draft guidelines on BAT and BEP. Hence, UNIDO cooperates with the Government of Vietnam to achieve this goal.

SECTION C. THE PROJECT

C.1. Objective of the project

37. The overall objective of the Medium Size Project (MSP) is to establish the required human resources and infrastructure to implement the obligations of the Stockholm Convention in Article 5 "Measures to reduce and eliminate releases from unintentional production" and coordinate its activities with the national strategies for environmental protection and the national strategies for industrial and sustainable development and cleaner production and thus contribute to the improvement of human and environmental health.

38. The specific objective of the project aims at:

- Reducing unintentional production of POPs in key sectors of the industry listed in Part II: Source categories in Annex C of the Stockholm Convention by implementation of BAT/BEP; and
- Supporting the BAT/BEP projects and addressing other UP-POPs related issues by development of monitoring and research capacities.

39. Achieving the specific objectives will enable the key industrial sectors that have the potential for comparatively high formation and release of UP-POPs to the environment a more sustainable development and the country to comply with their obligations under the Stockholm Convention in respect to the UP-POPs releases. Further the development of adequate monitoring capacity provides the required infrastructure and services for all future activities in the area of UP-POPs and POPs destruction projects.

C.2. The UNIDO approach

40. The project implementation arrangements will be based on the following principles:

- Establish and well-defined cooperation among governmental authorities involved in environmental protection and industrial development including local authorities, the VNCPC, the private sector, universities/research institutions and NGOs.
- Accountability of the project related work and expenditures of all involved parties;
- Transparency through clearly defined monitoring indicators and evalution methodologies including data generation throughout the project implementation.

41. **UNIDO** will be the **implementing agency (IA)** of the project and will take the responsibility of the day-to-day overlook of the project management. UNIDO is committed to assist its developing country Member States with fulfillment of their obligations under the Stockholm Convention. The GEF has approved more than 40 Enabling Activities projects for UNIDO, including China and India, which have opted to undertake NIP development through the GEF full project cycle. In addition, UNIDO is executing and/or developing a range of demonstration and capacity building projects to support the Convention implementation, including several BAT/BEP related projects. UNIDO has committed considerable effort to build this assistance program, both in support of the Convention implementation and in furtherance of UNIDO's mandate and corporate strategy in support of the Millennium Development Goals.

42. **Vietnam Environmental Protection Agency (VEPA)** of the Ministry of Natural Resources and Environment will be the **national executing agency (NEA)**, as it is the national focal point for the Stockholm Convention in Vietnam. VEPA has significantly contributed to the design and drafting of this MSP proposal as well as the mobilisation of co-financing.

43. The ***Project Steering Committee (PSC)*** will be established composing high-level representatives from the Ministry of Natural Resources and Environment, Vice Minister, Chairperson; Vietnam Environmental Protection Agency (VEPA), Vice Chairperson; Ministry of

Industry, Ministry of Science and Technology, Ministry of Planning and Investment, Ministry of Education and Training, Universities and research institutes, National Cleaner Production Centre, private sector, NGOs and UNIDO. The PSC will further take the role of overseeing the various POPs projects in Vietnam, with regular status updates from the sector projects. The PSC will facilitate sector projects and ensure that no undue overlaps are taking place. The PSC will hold its regular sessions once a year throughout the project implementation, but additional meetings can be held if necessary. It will oversee the project related work of PMT and the implementation teams and will review, comment on and approve the work plan. All decisions of the committee, such as respective responsibilities, timelines and the budget will be clearly communicated to those parties concerned. Activities will be implemented through instruments of subcontracts. Submitted tenders, contracts and TORs will be reviewed and evaluated by the PSC. Any major changes in the project plans or programs will require the approval from the PSC to take effect. PSC members will facilitate the implementation of the project activities in their respective organizations, ensure that activities are implemented in a timely manner and facilitate the integration of project-inspired activities to existing programs and practices. Representatives of partner and co-funding organizations, which are not represented in the PSC, will be invited to attend the meetings as needed.

44. The ***Project Management Team (PMT)*** composed of representatives from VEPA, MOI and VNCPC will be established for the day-to-day monitoring of implementation progress based on the project's annual work plan and its indicators. The PMT will inform UNIDO of any delays or difficulties faced during implementation so that appropriate support or corrective measures can be adopted in a timely and remedial fashion.

45. The **Chief Technical Advisor (CTA)** and **National Technical Advisor (NTA)** will be recruited to fine-tune the progress and performance/impact indicators for the project in consultation with the full project team.

46. The project will stress on the participation of relevant stakeholders within the country who will be responsible as follows:

Stakeholder	Responsibility
MONRE	- Serve the PSC in coordinating relevant ministries, sectors and localities for implementation of BAT/BEP in Vietnam; - Develop network of relevant ministries, sectors, universities, research institutions, waste treatment enterprises, NGOs and local communities for implementation of BAT/BEP; - Develop capacity, including human and material resources for the monitroing of Annex C POPs of the Stockholm Convention; - Develop and finalise policies, institutions and legal documents for the prevention, reduction and elimination of UP-POPs in accordance with the roadmap of Stockholm Convention; - Develop a national information system for the management of UP-POPs and hazardours wastes.
MOI	- Collaborate with relevant ministries, sectors and localities in developing options for promoting BAT/BEP in pilot projects to minimize the unintentional production and release of UP-POPs from production and serve activities; - Study and apply technologies and guide the application of the model technologies in the sound management, treatment and disposal of UP-POPs.
MOH	- Assess the adverse impact of UP-POPs on human health and the environment; - Regularly update the rates of UP-POPs exposure and study the impact of UP-POPs on human health in order to develop effective prevention and therapy measures.
VNCPC	- Contribute BAT/BEP expertise developed during the pilot projects. The preparation of teaching materials and workshops and further active involvement in BAT/BEP implementation projects. - The first UP-POPs emission sampling might be developed at Institute of Environmental Science and Technology (INEST). The institute already has a well-educated stack emission sampling team including dust measurements. The monitoring team continues support in BAT/BEP projects ad possibly educate then other sampling teams.

Private sector	- Private sector engagement has been encouraged at the design phase of this project and will be encouraged throughout the project implementation.
NGOs	- NGOs will contribute actively by commenting on the development of strategies and legal documents on environmental protection, exchanging experiences and expertise, enhancing internatinal cooperation, disseminating knowledge of environmental protection, and also supporting governmental authorities in supervising environmental protection in localities and facilities.

C.3 RBM code and thematic area code

FG50 CE17 – Stockholm Convention

C.4. Expected outcomes

47. There are five (5) outcomes designed to achieve the objectives of the project:

- Capacity building of self-reliant managerial and technical personnel with professional competencies in applying BAT/BEP in priority industrial source categories to reduce UP-POPs releases;
- Enhanced efficiency in reducing, avoiding and eliminating UP-POPs releases and reducing releases of other pollutants by coordinating the implementation of the Stockholm Convention action plans with cleaner production activities in the industry and review and possibly improve national policies and regulations;
- Enhanced capability for establishment and operation of adequate monitoring infrastructure for UP-POP chemicals as one key prerequisites for implementing BAT/BEP but also many other obligations of the Stockholm Convention;
- A socio-economic development program established to address efficacy and efficiency of possible control measures in meeting risk reduction goals including incremental cost estimation for the implementation of BAT/BEP at enterprise level and sector level; and
- Project management structure and M&E mechanism in place.

C.5. Outputs and activities

48. Outcomes/Outputs will be achieved by performing a set of activities as follows. Due to novelty of this MSP, brief explanatory notes have been given, as appropriate, after the headings of outputs and activities. These notes facilitate the understanding of and bring transparency to this project of complex technical nature.

Outcome 1: Capacity building of self-reliant managerial and technical personnel with professional competencies in applying BAT/BEP in priority industrial source categories to reduce UP-POPs releases

Output 1.1 Pilot projects for UP-POPs reduction in the sectors of waste incineration, cement kilns, pulp and paper production and secondary metallurgical industry

49. Testing the techno-economic and socio-economic impacts of adopting BAT/BEP country-wide in those industrial source categories that have potential for comparatively high formation and release of UP-POP (Part II; Source categories, Annex C of the Stockholm Convention) pilot projects will be implemented in a number of selected enterprises. One of the criteria for the selection process will be the enterprise commitment to introduce BAT/BEP measures as the MSP budget does not allow the procurement of BAT such as bag filters in a waste incinerator or flue gas treatment of a sinter plant which are in the cost order of US$ millions. Other selection criteria will be the commitment for (i) building human capacities, (ii) addressing all three release vectors (air, solids and water), (iii) application of different primary measures (management and operational procedures that UP-POPs formation is reduced and minimized) and different secondary measures (end of pipe solutions for destruction or adsorption of formed

UP-POPs for reducing and minimizing their final release to the environment), (iv) performing cost-effectiveness evaluation, and (v) performing incremental cost analysis.

50. A further technical feature of MSP is the release vector related adoption of BAT/BEP. In the different source categories the importance of release vectors is greatly varied, therefore BAT/BEP should introduce measures for reduction of UP-POPs releases mainly in:

- air for incinerators, metallurgical industry and cement production,
- water/effluent for pulp and paper, landfill leachate treatment and contaminated site clean up within the perimeter of the selected pilot enterprises and sludge treatment, and
- solids for incinerators, metallurgical industry and sludges.

	Activity	Responsibility
1.1.1	Pilot projects in sector of the secondary copper, secondary iron and steel industry (including sinter plants) and secondary aluminum Estimated annual PCDD/PCDF releases from the inventory: secondary copper production (50 g TEQ release), sinter plants in the iron and steel industry (8 g TEQ release), secondary steel production (68 g TEQ release), secondary aluminum production (20 g TEQ release), and secondary zinc production (3g TEQ release). The following activities will be undertaken: ➢ Development of specifications on operation processes in the secondary copper, secondary iron and steel (including sinter plants) and secondary aluminum industry ➢ Development of booklets for BEP Application in the metallurgical sector for pilot application based on the previously achieved experience ➢ Selection of representative companies from the metallurgical sector for the demonstration program ➢ Development of the demonstration program ➢ Establish operation process optimization strategies and carry out staff trainings on BEP application at the demonstration institutions ➢ Monitoring, recording and evaluation of the implementation process and results	VEPA, MOI, NCPC, UNIDO
1.1.2	Pilot projects in the sector of waste incineration including municipal, hazardous and medical waste incinerators Estimated annual release values of incinerators are as follows: municipal wastes (122 g TEQ into air), industrial and hazardous waste (183 g TEQ into air), medical waste (190 g TEQ into air). The following activities will be undertaken: ➢ Development of specifications on waste management strategies and operation processes in the waste incineration sector ➢ Development of booklets for BEP Application in the waste incineration sector for pilot application based on the previously achieved experience ➢ Selection of representative companies from the waste incineration sector for the demonstration program ➢ Development of the demonstration program on BAT/BEP ➢ Establishment of operation process optimization and waste management strategies and carry out staff trainings on BEP application at the demonstration institutions	VEPA, MOI, NCPC, UNIDO

	Activity	Responsibility
	➢ Monitoring, recording and evaluation of the implementation process and results For enterprise selection at least three criteria will be considered: ➢ Existing facilities for which BEP improvements will be implemented only by operation process improvement; ➢ Existing incinerator for which the operation process will be improved and reduction of UP-POPs air emission will additionally be reduced by improvement of the flue gas cleaning; and *Newly purchased incinerator(s) with adequate BAT/APCS for which operation process optimization will have to be applied.*	
1.1.3	Pilot project with cement kiln firing waste or hazardous wastes. The estimated release value from cement kilns is relatively low (17 g TEQ into air). However, according to a new national strategy that is being developed in Vietnam, the cement industry may play an important role in hazardous waste management and destruction of POPs pesticides and PCB-containing oil. These facilities then need a strict emission monitoring for UP-POPs and POPs emissions and would be included in the MSP. The following activities will be undertaken: ➢ Development of specifications on waste management strategies and operation processes in the cement production sector ➢ Development of booklets for BEP Application in the cement production sector for pilot application based on the previously achieved experience ➢ Selection of representative companies from the cement production sector for the demonstration program ➢ Development of the demonstration program on BAT/BEP ➢ Establishment of operation process optimization and waste management strategies and carry out staff trainings on BEP application at the demonstration institutions ➢ Monitoring, recording and evaluation of the implementation process and results	VEPA, MOI, NCPC, UNIDO
1.1.4	Pilot project with a pulp and paper mills using chlorine bleaching The pulp and paper industry has an estimated annual release of 44 g TEQ. The following activities will be undertaken: ➢ Development of specifications on operation processes in the pulp and paper sector ➢ Development of booklets for BEP Application in the pulp and paper sector for pilot application based on the previously achieved experience ➢ Selection of representative companies from the pulp and paper sector for the demonstration program ➢ Development of the demonstration program on BAT/BEP ➢ Establishment of operation process optimization strategies and carry out staff trainings on BEP application at the demonstration institutions ➢ Monitoring, recording and evaluation of the implementation process and results	VEPA, MOI, NCPC, UNIDO

Output 1.2: Developing of monitoring capacity and linking of the research institutions and programs such as VNCPC on UP-POPs, POPs and other relevant toxic pollutant emissions in the country

51. Reliable and accredited monitoring (sampling and analysis) is a prerequisite for guiding of BAT/BEP projects and for evaluating BAT/BEP implementation. Within the MSP the monitoring capacity for unintentionally produced POPs will be developed and improved to international standards before and during the early phase of the BAT/BEP pilot projects.

52. This activity further supports the National Strategy on Pollution Control in respect to monitoring (see NIP Vietnam) "Develop and complete monitoring network following the national plan for environmental monitoring. In the coming year prioritize on setting up monitoring centers and monitoring points at critical economic zones. Link information between the monitoring centers and monitoring points with the national network."

53. Emission monitoring/sampling: The second prerequisite for a UP-POPs project dealing with release reduction at enterprise level is the monitoring. Most of BAT/BEP implementation makes only sense if it is accompanied and guided by release data requiring reliable sampling and analysis. At the moment there is no air emission sampling capacity and analytical equipment for UP-POPs in Vietnam and also the air emission monitoring capacity is limited. Therefore in course of the MSP and especially at its early phase a reliable UP-POPs air emission monitoring capacity has to be established.

54. Several institutes in Vietnam have already bought expensive analytical equipment for PCDD/PCDF analysis and now accredited PCDD/PCDF analysis has to be established. It would require several activities including education of personnel for extraction and clean up for different matrices, accreditation (ISO17025 for PCDD/PCDF) and the participation in international intercalibration studies.

	Activity	**Responsibility**
1.2.1	Design monitoring programs for UP-POPs releases in the pilot projects.	VEPA, MOI, UNIDO
1.2.2	Evaluation and introduction of international standard sampling procedures supported by appropriate capacity building. The following methods will be considered: ➢ Stack emission sampling (short term sampling and long term sampling) ➢ Other sampling (water, sediments and soil)	VEPA, MOI, UNIDO
1.2.3	Establishment of international contacts and collaborations. This includes: ➢ Participation in intercalibration studies	UNIDO
1.2.4	Conduct monitoring of UP-POPs in the pilot projects in accordance to their monitoring programs.	VEPA, MOI

Output 1.3 Harmonization of BAT/BEP reduction measures for UP-POPs with reduction measures for other environmental relevant pollutant releases

	Activity	**Responsibility**
1.3.1	To achieve efficiency, harmonize, by optimizing process parameters, the implementation of BAT/BEP for UP-POPs reduction with reduction measures for other relevant pollutant releases (especially dust and heavy metals).	VEPA, UNIDO

Output 1.4 Development of information, education and communication (IEC) materials and implementation of IEC programs

	Activity	Responsibility
1.4.1	Develop IEC materials for facilities and industries with processes releasing UP-POPs.	VEPA
1.4.2	Intensive communication and preparation of awareness-raising activities on BAT and BEP opportunities in the industrial sector. ➢ Pre-test IEC materials and programs ➢ Dissemination of the IEC materials to the industry at national level. ➢ Coordinate with Local Government Units and regulatory agencies on implementation of IEC programs and harmonize with the promotion of environmental, health and safety programs (UP-POPs as one of the topics). ➢ Evaluation of PhD and master course thesis materials developed during the MSP for further use as information or teaching materials	VEPA, MOI
1.4.3	Raising awareness of general public on UP-POPs sources related to releases from common practices. Several sources of UP-POPs are related to common practices of the population at large. These are as follows: ➢ Open burning of waste, ➢ Open burning of agricultural waste, and ➢ Household heating and cooking, etc.	VEPA, NCPC
1.4.4	Raising awareness of policy makers on specific BAT/BEP issues including waste management policies	VEPA, MOI

Outcome 2: Enhanced efficiency in reducing, avoiding and eliminating UP-POPs releases and reducing releases of other pollutants by coordinating the implementation of the Stockholm Convention action plans with BAT/BEP activities in the industry on the national and regional scale and review and possibly improve national policies and regulations

Output 2.1 Coordinating project activities with other national and regional programs related to the BAT/BEP implementation

	Activity	Responsibility
2.1.1	Coordinate BAT/BEP implementation with the National Strategy on Environmental Protection.	VEPA
2.1.2	Coordinate BAT/BEP implementation with other pollution reduction programs of the Vietnamese government and related cleaner production activities.	VEPA
2.1.3	Coordinate information exchange with the Chair of the Regional ESEA BAT/BEP Forum.	UNIDO, VEPA, MOI
2.1.4	Coordinate participation of universities and research institutions in the pilot projects (monitoring and engineering).	VEPA
2.1.5	Development of the research capacities and programs on UP-POPs and coordinate them with research activities on POPs and other relevant environmental pollutant releases.	VEPA, UNIDO

Output 2.2. Survey and evaluation of international policies and regulations on UP-POPs and other pollutant releases from pertinent industrial source categories and their relationship and potential relevance for BAT/BEP measures

Activity		Responsibility
2.2.1	Review international policies and regulations pertaining to UP-POPs with particular reference on regulations related to BAT/BEP.	VEPA, UNIDO
2.2.2	Review implementation strategy and timelines of these policies and regulations in selected countries having already implemented the regulations for years or decades for specific installations and industries.	VEPA, UNIDO
2.2.3	Analyze how would measures introduced to reduce UP-POPs air emission would additionally reduce other emissions of other organic (PAH, VOC) and inorganic compounds as well as particulates.	UNIDO
2.2.4	Design efficient approaches for harmonized implementation of BAT/BEP measures for total emission reduction of pollutants.	UNIDO
2.2.5	Coordinate activities with the National Strategy for the task to "Continue to complete and amend the legal system, mechanisms and policy in the sector of environmental pollution prevention and control" by carrying out a gap analysis for the lack of specific requirements in the policy and regulatory framework.	VEPA
2.2.6	Evaluation of options for enforcement.	VEPA, UNIDO

Outcome 3: Capacity building for monitoring procedures for UP-POP chemicals as one key prerequisites for implementing BAT/BEP[9] but also many other obligations of the Stockholm Convention

Output 3.1 Training on the monitoring of UP-POP chemicals in Vietnam for guiding and assessment of BAT/BEP projects

55. As all UP-POPs sources have multiple pollutant emissions, therefore the capacity building programs on UP-POPs emission reduction needs to be embedded in a broader program on emission reduction strategies for a wide range of relevant pollutants.

Activity		Responsibility
3.1.1	Select engineers/technical personnel participating in the pilot projects for a training program on the sampling and monitoring of UP-POPs.	UNIDO
3.1.2	Develop knowledge and experience in UP-POPs and BAT/BEP and the interrelation of UP-POPs reduction strategies with other relevant pollutant reduction strategies.	UNIDO, NCPC
3.1.3	Use the pilot projects and their experienced technical and managerial staff as educational tool for in-plant training programs.	VEPA

Outcome 4: A socio-economic development programme established to address efficacy and efficiency of possible control measures in meeting risk reduction goals including incremental cost estimation for the implementation of BAT/BEP at enterprise level and sector level

Output 4.1 Incremental cost estimation and cost-effectiveness evaluation for BAT/BEP implementations

[9] This is also a prerequisite for all activities in respect to future activities on PCB and Pesticide destruction and for contaminated site assessment.

	Activity	Responsibility
4.1.1	Develop incremental cost estimation methodology for BAT/BEP implementation at different industrial source categories.	UNIDO
4.1.2	Review international experience of incremental cost calculation for BAT/BEP implementation.	UNIDO
4.1.3	Develop a database for sources of BAT/BEP and international experiences on incremental costs calculation.	VEPA, UNIDO
4.1.4	Compare international cost estimates for BAT/BEP implementation with the experiences gained from the implementation of the BAT/BEP pilot projects.	UNIDO
4.1.5	Perform incremental cost estimates on enterprise level for the different BAT/BEP options.	VEPA, MOI, UNIDO

Output 4.2 Compilation of incremental cost estimates at sector level for total cost estimates for BAT/BEP implementation at national level

	Activity	Responsibility
4.2.1	Prepare a projection of cost estimate for countrywide introduction of BAT/BEP measures at sector level based on the experience gained through the pilot projects.	VEPA, UNIDO

Output 4.3 Evaluation of cost/benefit of BAT/BEP options and comparison with environmental cost savings and improvement of occupational health and safety

	Activity	Responsibility
4.3.1	Evaluate cost benefit of BAT/BEP measures introduced to reduce UP-POPs.	UNIDO
4.3.2	Compare the costs for implementation of the different BAT/BEP options at enterprise/facility level of the pilot project.	VEPA, MOI, UNIDO
4.3.3	Evaluate environmental cost savings by introducing BAT/BEP measures.	UNIDO, NCPC
4.3.4	Assess improvement of occupational health and safety in pilot projects by introducing BAT/BEP.	VEPA

Output 4.4 Development of incentives/rewards system for adopting BAT/BEP

	Activity	Responsibility
4.4.1	Review existing reward system.	VEPA
4.4.2	Develop selection/merit criteria to facilitate and reward outstanding performance.	VEPA
4.4.3	Identify possible sources of reward/award.	VEPA, MOI

Output 4.5 Developing financing mechanism and programs for adopting BAT/BEP

	Activity	Responsibility
4.5.1	Review existing financial programme for technology transfer.	VEPA, UNIDO
4.5.2	Conduct consultative meetings with implementing agencies for the development of financing programme.	UNIDO

Outcome 5: Project management, monitoring and evaluation

Output 5.1 Establish the project management structure

Activity		Responsibility
5.1.1	Establish the Project Steering Committee by relying on resources from related ministries or agencies at the national level, and from local governmental agencies as appropriate.	VEPA, UNIDO
5.1.2	Establish the National Project Management Team under Convention Implementation Focal Point.	VEPA
5.1.3	Recruit a Chief Technical Advisor (CTA, an international consultant), a National Technical Advisor (NTA), policy experts, technical experts in BAT/BEP and monitoring and research.	UNIDO
5.1.4	Establish local project management nodules in selected provinces as appropriate.	VEPA, MOI
5.1.5	Carry out a series of management training courses to the national and local project management staff.	NCPC, UNIDO

Output 5.2 Design and implement an M&E mechanism according to GEF M&E procedures

Activity		Responsibility
5.2.1	Hold inception workshop.	VEPA, UNIDO
5.2.2	Prepare the inception report.	VEPA, UNIDO
5.2.3	Measure impact indicators on an annual basis.	VEPA, UNIDO
5.2.4	Prepare Annual Project Reports and Project Implementation Reviews.	VEPA, UNIDO
5.2.5	Hold annual Project Steering Committee meetings.	VEPA, UNIDO
5.2.6	Carry out mid-term external evaluation.	VEPA, UNIDO
5.2.7	Carry out final external evaluation.	VEPA, UNIDO
5.2.8	Complete the Terminal Report.	VEPA, UNIDO
5.2.9	Carry out annual project financial audits.	VEPA, UNIDO
5.2.10	Carry out visits to selected pilot sites at least twice a year.	VEPA, UNIDO
5.2.11	Establish a project management information system (MIS), including a project website to disseminate information to various stakeholders.	VEPA, UNIDO

C.6. Tentative Timeline of the activities

Outputs/Activities	Duration of Project (in months)																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Outcome 1: Capacity building of self-reliant managerial and technical personnel with professional competencies in applying BAT/BEP in priority industrial source categories to reduce UP-POPs releases																								
Output 1.1 Pilot projects for UP-POPs reduction in the sectors of waste incineration, cement kilns, pulp and paper production and secondary metallurgical industry.																								
Activity 1.1.1 Pilot projects in sector of the secondary copper, secondary iron and steel industry (including sinter plants) and secondary aluminium.																								
Activity 1.1.2 Pilot projects in the sector of waste incineration including municipal, hazardous and medical waste incinerators.																								
Activity 1.1.3 Pilot project with cement kiln firing waste or hazardous waste.																								
Activity 1.1.4 Pilot project with a pulp and paper mills using chlorine bleaching.																								
Output 1.2: Developing of monitoring capacity and linking of the research institutions and programs such as VNCPC on UP-POPs, POPs and other relevant toxic pollutant emissions in the country.																								
Activity 1.2.1 Design monitoring programs for UP-POPs releases in the pilot projects.																								
Activity 1.2.2 Evaluation and introduction of international standard sampling procedures supported by appropriate capacity building.																								
Activity 1.2.3 Establishment of international contacts and collaborations.																								
Activity 1.2.4 Conduct monitoring of UP-POPs in the pilot projects in accordance to their monitoring programs.																								
Output 1.3: Harmonization of BAT/BEP reduction measures for UP-POPs with reduction measures for other environmental relevant pollutant releases																								

Outputs/Activities	Duration of Project (in months)																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Activity 1.3.1 To achieve efficiency, harmonize, by optimizing process parameters, the implementation of BAT/BEP for UP-POPs reduction with reduction measures for other relevant pollutant releases (especially dust and heavy metals).																								
Output 1.4 Development of information, education and communication (IEC) materials and implementation of IEC programs																								
Activity 1.4.1 Develop IEC materials for facilities and industries with processes releasing UP-POPs																								
Activity 1.4.2 Intensive communication and preparation of awareness-raising activities on BAT and BEP opportunities in the industrial sector																								
Activity 1.4.3 Raising awareness of general public on UP-POPs sources related to releases from common practices																								
Activity 1.4.4 Raising awareness of policy makers on specific BAT/BEP issues including waste management policies																								
Outcome 2: Enhanced efficiency in reducing, avoiding and eliminating UP-POPs releases and reducing releases of other pollutants by coordinating the implementation of the Stockholm Convention action plans with BAT/BEP activities in the industry on the national and regional scale and review and possibly improve national policies and regulations																								
Output 2.1 Coordinating project activities with other national and regional programs related to the BAT/BEP implementation																								
Activity 2.1.1 Coordinate BAT/BEP implementation with the National Strategy on Environmental Protection																								
Activity 2.1.2 Coordinate BAT/BEP implementation with other pollution reduction programs of the Vietnamese government and related cleaner production activities																								
Activity 2.1.3 Coordinate information exchange with the Chair of the Regional ESEA BAT/BEP Forum																								
Activity 2.1.4 Coordinate participation																								

Outputs/Activities	Duration of Project (in months)																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
of universities and research institutions in the pilot projects (monitoring and engineering)																								
Activity 2.1.5 Development of the research capacities and programs on UP-POPs and coordinate them with research activities on POPs and other relevant environmental pollutant releases																								
Output 2.2. Survey and evaluation of international policies and regulations on UP-POPs and other pollutant releases from pertinent industrial source categories and their relationship and potential relevance for BAT/BEP measures																								
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Activity 2.2.3 Analyze how would measures introduced to reduce UP-POPs air emission would additionally reduce other emissions of other organic (PAH, VOC) and inorganic compounds as well as particulates.																								
Activity 2.2.4 Design efficient approaches for harmonized implementation of BAT/BEP measures for total emission reduction of pollutants.																								
Activity 2.2.5 Coordinate activities with the National Strategy for the task to "Continue to complete and amend the legal system, mechanisms and policy in the sector of environmental pollution prevention and control" by carrying out a gap analysis for the lack of specific requirements in the policy and regulatory framework																								

Outputs/Activities	Duration of Project (in months)																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Activity 2.2.6 Evaluation of options for enforcement																								
Outcome 3: Capacity building for monitoring procedures for UP-POP chemicals as one key prerequisites for implementing BAT/BEP but also many other obligations of the Stockholm Convention																								
Output 3.1 Training on the monitoring of UP-POP chemicals in Vietnam for guiding and assessment of BAT/BEP projects																								
Activity 3.1.1 Select engineers/technical personnel participating in the pilot projects for a training program on the sampling and monitoring of UP-POPs																								
Activity 3.1.2 Develop knowledge and experience in UP-POPs and BAT/BEP and the interrelation of UP-POPs reduction strategies with other relevant pollutant reduction strategies																								
Activity 3.1.3 Use the pilot projects and their experienced technical and managerial staff as educational tool for in-plant training programs																								
Outcome 4: A socio-economic development program established to address efficacy and efficiency of possible control measures in meeting risk reduction goals including incremental cost estimation for the implementation of BAT/BEP at enterprise level and sector level																								
Output 4.1 Incremental cost estimation and cost-effectiveness evaluation for BAT/BEP implementation																								
Activity 4.1.1 Develop incremental cost estimation methodology for BAT/BEP implementation at different industrial source categories																								
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Activity 4.1.4 Compare international cost estimates for BAT/BEP implementation with the experiences gained from the implementation of the BAT/BEP pilot projects																								

Outputs/Activities	Duration of Project (in months)																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Activity 4.1.5 Perform incremental cost estimates on enterprise level for the different BAT/BEP options																								
Output 4.2 Compilation of incremental cost estimates at sector level for total cost estimates for BAT/BEP implementation at national level																								
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Output 4.3 Evaluation of cost/benefit of BAT/BEP options and comparison with environmental cost savings and improvement of occupational health and safety																								
Activity 4.3.1 Evaluate cost/benefit of BAT/BEP measures introduced to reduce UP-POPs																								
Activity 4.3.2 Compare the costs for implementation of the different BAT/BEP options at enterprise/facility level of the pilot project																								
Activity 4.3.3 Evaluate environmental cost savings by introducing BAT/BEP measures																								
Activity 4.3.4 Assess improvement of occupational health and safety in pilot projects by introducing BAT/BEP measure																								
Output 4.4 Development of incentives/rewards system for adopting BAT/BEP																								
Activity 4.4.1 Review existing reward system																								
Activity 4.4.2 Develop selection/merit criteria to facilitate and reward outstanding performance																								
Activity 4.4.3 Identify possible sources of reward/award																								

Outputs/Activities	Duration of Project (in months)																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Output 4.5 Develop financing mechanism and programmes for adopting BAT/BEP																								
Activity 4.5.1 Review existing financial programme for technology transfer																								
Activity 4.5.2 Conduct consultative meetings with implementing agencies for the development of financing programme																								
Outcome 5: Project management, monitoring and evaluation																								
Output 5.1 Establish the project management structure																								
Activity 5.1.1 Establish the Steering Committee																								
Activity 5.1.2 Establish the National Project Management Team under Convention Implementation Focal Point																								
Activity 5.1.3 Recruit a CTA, NTA, policy experts, technical experts in BAT/BEP and monitoring and research																								
Activity 5.1.4 Establish a local project management modules in selected provinces as appropriate																								
Activity 5.1.5 Carry out a series of management training courses to the national and local project management staff																								
Output 5.2 Design and implement an M&E mechanism according to GEF M&E procedures																								
Activity 5.2.1 Hold the inception workshop																								
Activity 5.2.2 Prepare the inception report																								
Activity 5.2.3 Measure the impact indicators on an annual basis																								
Activity 5.2.4 Prepare annual project reports and Project Implementation Reviews																								
Activity 5.2.5 Hold annual PSC meetings																								

Outputs/Activities	Duration of Project (in months)																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Activity 5.2.6 Carry out mid-term external review																								
Activity 5.2.7 Carry out final external evaluation																								
Activity 5.2.8 Complete the Terminal Report																								
Activity 5.2.9 Carry out annual project financial audits																								
Activity 5.2.10 Carry out visits to selected pilot sites at least twice a year																								
Activity 5.2.11 Establish a project management information system (IMS) including project website to disseminate information to various stakeholders																								

C.7. RISKS, SUSTAINABILITY AND REPLICABILITY

Possible Risks

56. The risks are identified as follows:

Risk	Risk management measures
Lack of adequate inter-ministerial and stakeholder coordination and cooperation	Establishment of inter-sector Project Steering Committee representing all relevant stakeholders
Lack of technical competencies and timely resources, both human and financial resources, for monitoring institutions and selected pilot enterprise owners to adequately support and participate in project activities	Strong capacity building activities and provision of financial support to project participants and stakeholders
Conflicting stakeholder interests will inhibit realization of project goals	Identification of potentially conflicting stakeholder interests through involvement of stakeholders in the project design process
Failure to adequately implement polluter pays principle and other innovative incentive and reward system to facilitate country-wide dissemination of BAT/BEP	Stakeholder awareness building will increase acceptance of the fee-based system, and newly introduced incentives will encourage private sector to adopt BAT/BEP
Lack of building on the synergies between introducing BAT/BEP measures and measures addressing climate change	Measures increasing air quality will address both UP-POPs and greenhouse gases emissions

Sustainability

57. Sustainability will be achieved through integrating the outcomes of the MSP into:

- The "*National Strategy on Environmental Protection until 2010 and towards 2020*". Among the specific objectives of the Strategy, there are several directly related to BAT/BEP. These include "Priority Programmes" such as (i) MT.PK5 Cleaner production and environmentally friendly technology adoption in Vietnam; Rank: High; Target completion: 2010; (ii) MT.PK6 Incentives for enterprises in environmental protection and international economic integration; Rank: High; Target completion: 2010 for 1st phase; and (iii) MT.PK7 Development and implementation of environmentally friendly technology innovation road map; Rank: High; Target completion: 2010.
- The pollution prevention and control programmes of MOI covering priority industries of comparatively high formation and release of UP-POPs chemicals to the environment.
- Coordination with the National POPs Priority Programmes and other National Priority Projects from the NIP.

Replicability

58. This is the first project in Vietnam to explore and apply BAT/BEP to the reduction and where feasible elimination of releases of UP-POPs in selected enterprises of four different source categories. The project will provide experience for analysis of cost/effectiveness to plan a countrywide dissemination of project results.

59. To achieve replicability specific actions with work plan and budget to foster knowledge transfer such as training workshops, scientific evaluations and publication, information exchange will be carried out that are elaborated in detail in the MSP proposal. However, its major elements are summarized below:

- *Cooperation with Vietnam Cleaner Production Cen*ter: The approach to closely involve the VNCPC into the Stockholm Convention BAT/BEP process can be transformed with respective country specific modifications in all developing countries and regions hosting a cleaner production center.
- *Pilot Projects*: The MSP will select and conduct pilot projects for key facilities and industries with the aim of countrywide replicability. In the respective pilot projects local staff will be educated and trained that after the MSP phase national experts are available for training for national wide implementation of BAT/BEP in the relevant sectors.
- *Training*: The project will involve capacity building by developing and delivering training modules. The training modules will be developed together with international experts, but will involve local staff that will be able to serve as resource persons for training beyond the project life. Consideration will be given to the integration of POPs modules into the existing training programs of the environment and research organizations in Vietnam in particular to activities of the VNCPC but also at universities, chemicals management organizations, foundations involved in outreach activities etc.
- *Monitoring capacity*: One of the most important prerequisites of adopting BAT/BEP is adequate monitoring capacity, which will be developed during the MSP. This will provide services to all other BAT/BEP project in the country and the capacity might be used in neighboring countries. Furthermore the development of monitoring capacity itself can be replicated in the country (e.g. in South Vietnam) with the experience and under assistance of the capacity developed in the MSP. The approach of developing monitoring capacity might be transferred with country specific modification also in other countries.
- *Scientific and engineering capacity*: BAT technology needs understanding of application and skill for implementing the principles in facilities in the same sector having however different operation parameters. In the project a scientific and engineering capacity will be established having an understanding of the basic and detailed principles of applied technologies. This engineering capacity will then be able to successfully adopt BAT/BEP measures even in those facilities that have different conditions and process parameters from those of the pilot projects. This approach is therefore the transgression of simple replicability towards flexible replicability.
- *Innovative financing mechanisms*: Replicability of BAT/BEP adaptation measures beyond the project life will require capacity that includes not only know-how and a supportive policy environment, but also innovative financing mechanisms. Through exploring and piloting BAT/BEP in selected industries, the project will set models for mobilization of a broader set of financing options and establishes cooperation patterns with the private sector to take over the goals of the project and engage in adaptation work in the future.
- *Knowledge transfer through knowledge management*: Reports will be presented in the form of workshop reports, newsletters, and inventory and data collection reports. *In addition workshop modules will be developed which can be used* for regional workshops in the regional provinces of Vietnam. Conclusions of the scientific evaluations of the data and regular monitoring results will be published in scientific journals and will be integrated into public awareness programs beyond the project. In addition knowledge transfer will be facilitated through UNIDO beyond the country. Vietnam is a member country to the Regional BAT/BEP Forum for East and South East Asia (ESEA) countries, which was adopted in Bangkok in October 2007. In order to share information and exchange experiences gained during the implementation of the BAT/BEP pilot projects with other Forum member countries, it is planned that the Project Steering Committee and UNIDO closely cooperates with and reports the results of this project to the Chair of the Regional ESEA Forum on BAT/BEP.

SECTION D. INPUTS

D.1. Counterpart inputs

60. The GEF, as the financial mechanism for the Stockholm Convention will provide a proposed US$ 750,000 incremental cost funding for the project, including US$ 50,000 expended for the project preparation. The Government of Vietnam through the Ministry of Industry and MONRE/VEPA has committed US$ 1,300,000 as cash and in-kind contribution to the project to be used mainly for capacity building for the demonstration sites, cleaner production, socio-economic programme and part of the monitoring costs.

Baseline scenario

61. The current baseline constitutes well-capacitated national government with the preliminary identification of UP-POPs sources and release estimates. Initial public awareness and participation have been achieved through the development of the NIP. The NIP also highlights the general socio-economic status of the country and provides a strong baseline for GEF's support. Overall, the establishment and maintenance of effective legal, scientific, economic, and political institutional framework for UP-POPs are significantly hampered because of insufficient human and financial resources. This deficiency is further compounded by the lack of adequate human resources at administrative and technical level that is required to design, implement, monitor, and enforce relevant policies, regulations as well as develop and formulate programs that are vital in the implementation of the Convention.

62. In the absence of this project, the adoption of BAT/BEP measures in Vietnam is hampered by the following:

- A source specific UP-POPs release inventory was compiled by the use of UNEP toolkit. However, the inventory does not include relevant technology information on the facilities and therefore specific technology requirements cannot be identified. It hinders adoption (planning, procurement, introduction, implementation and monitoring) of BAT/BEP and does not allow incremental cost calculations.
- Limited technical experience and capacity in identifying and rational use of BAT/BEP makes impossible their efficient and timely adoption. In addition there is a lack of knowledge on UP-POPs formation, reduction and avoidance at technical/engineering but even research/academic level and also a lack of knowledge in the relationship of technological processes/operation conditions and UP-POPs releases.
- Lack of adequate sampling capacities for UP-POPs. It should be noted that some groups already have adequate, high quality and expensive analytical instruments but will require professional guidance and surveillance.

63. The formulation of an effective and efficient management framework to prevent, reduce or eliminate releases from unintentional production of POPs should be based on adequate scientific and socio-economic data and information. Under the baseline scenario, decision makers cannot take in account the threats posed by POPs on human health and environmental in the national context. The costs incurred by possible changes and identification of realistic measures required for effective and efficient management cannot be identified. Difficulties in providing adequate scientific and socio-economic data including the absence of pertinent, comprehensive and specific scientific data with special emphasis on the risk they pose to humans, wildlife, marine life and the environment and lack of tools for proper assessment of the socio-economic aspects related to this issue further escalate the current weaknesses.

Alternate scenario

64. The project will implement the principles of both environmentally and economically sustainable development and critically review trends and lessons to integrate them in coordinated actions.

Information on key national trends, including sources of UP-POPs, UP-POPs hotspots, vulnerability and impacts of these sources on the environment, human health, socio-economic development and public participation will be readily available.

65. The strategy of the introduction of BAT/BEP in selected key industrial sectors by pilot projects will generate and substantiate technical lessons and knowledge for up-scaling and further replication in other facilities and sectors. The practical application of the strategy will contribute to the national and international discussion on UP-POPs releases and their impacts on environment and a meaningful response will be obtained to make new management change through the adaptation of policies and measures.

66. The project and related activities can be divided in five phases, which are fully integrated under the overall project management processes.
- Phase I establishes the management structure and oversees the implementation national wide and in addition assesses the monitoring capacities on POPs/UP-POPs.
- Phase II improves the inventory of UP-POPs sources with a focus on basic information for BAT/BEP implementation by evaluation of the technologies presently used as a base for incremental cost estimates. As one possible methodology, developing pollutant release and transfer registers (PRTR) would be considered. It also highlights the baseline of socio-economic implications of the industries and their public awareness and participation aspects.
- Phase III conducts pilot projects in selected facilities and industries for key UP-POPs sources.
- In Phase IV, the source specific BAT/BEP national action plans are developed and implemented through generated funding resources.
- Phase V represents replication and dissemination of the implementation of the initial MSP proposal which turns into a sustainable program at national level.

67. It should be noted that the implementation of these phases could be conducted in parallel or in a largely overlapping manner.

68. The national action plans might introduce BAT/BEP through independent modules such as resources mobilization, economic development, environment protection and/or social development. As an illustration the national strategy may include the following modules:

- The project management module coordinates all activities at national level. It includes the monitoring and evaluation, where adaptive measures will be undertaken to confirm its adherence to the work plan associated with the pre-identified indicators as well as to modify the implementation in response to the unforeseen risks and inevitable changes in local circumstances.
- The knowledge management module will be responsible for delivering the timely reports on project implementation (later on the implementation of the entire strategy) and providing adequate cross-cutting technical information for decision makers such as the implementation impacts on the national socio-economic development or the effectiveness of the implemented BAT/BEP on reducing the pressure on the environment and human exposures.
- The tool development module will provide adequate methodological instruments for the field data collection, field monitoring and implementation of project. It will also transfer lessons of field experience into the regular update of these tools to provide uniform structure of data for processing and timely response to practical challenges.
- The national baseline report module will report the baseline data before the implementation of the national strategy is initiated. Afterwards, this module will be repeated regularly to provide a time-trend analysis of the measures and to confirm the continuous effectiveness of the national strategy implementation.
- The source inventories module will develop and maintain the information on the UP-POPs sources and their impacts on environment, human health, socio-economy and public awareness. This module also includes the regular updating of these inventories as implementation procedures and new data become available e.g. during Phase IV.

- A scientific evaluation module cumulates the inventory findings and the monitoring results (generated in Phase IV), analyses them and draws conclusions. This information is an input for the knowledge management module.

69. BAT/BEP national action plans in Phase IV comprises of three parts. Part A compiles the technological and economical aspects of the introduction of BAT/BEP. It includes the architectural planning of the potentially required modifications, the adapted environmental practices for the industry at large, the cost and benefit assessments of the modifications, etc. Part B elaborates how the implemented BAT/BEP will affect the environment and human health. It identifies monitoring points and procedures for analytical assessments. Part C develops monitoring program for the socio-economic implications of BAT/BEP dissemination countrywide. It also elaborates the public awareness program for the area.

70. BAT/BEP implementation initiatives open new, innovative economic incentives designed for sustainable development of the industry sectors, which facilitates the private sector to take over the implementation of the BAT/BEP measures from local and regional government authorities. The private sector is more and more engaged in the adaptation and the design of new public and private partnerships and cost-sharing arrangements thus public and private interests are better recognized and addressed. Through increased reinvestment at the local-scale, but nationally coordinated, implementation services will strengthen the base for a higher quality of the environment.

Summary Incremental Cost Matrix in US$

Project Components/Outcomes	Baseline	Increment	Alternative
Outcome 1: Capacity building of self-reliant managerial and technical personnel with professional competencies in applying BAT/BEP in priority industrial source categories to reduce UP-POPs releases	910,000	353,000	1,263,000
Outcome 2: Enhanced efficiency in reducing, avoiding and eliminating UP-POPs releases and reducing releases of other pollutants by coordinating the implementation of the Stockholm Convention action plans with BAT/BEP activities in the industry on the national and regional scale and review and possibly improve national policies and regulations	140,000	77,000	217,000
Outcome 3: Capacity building for monitoring procedures for UP-POP chemicals as one key prerequisites for implementing BAT/BEP10 but also many other obligations of the Stockholm Convention	150,000	141,000	291,000
Outcome 4: A socio-economic development program established to address efficacy and efficiency of possible control measures in meeting risk reduction goals including incremental cost estimation for the implementation of BAT/BEP at enterprise level and sector level	240,000	104,000	344,000
Outcome 5: Project management, monitoring and evaluation	150,000	75,000	225,000
Total project costs	**1,590,000**	**750,000**	**2,340,000**

D.2. UNIDO inputs

71. UNIDO will provide an in-kind contribution of US$ 40,000 for project management, monitoring and evaluation.

[10] This is also a prerequisite for all activities in respect to future activities on PCB and Pesticide destruction and for contaminated site assessment.

SECTION E. BUDGET

E.1 Project budget (GEF only) in US$

Outputs	Budget line	Budget description	Year 1		Year 2		Total	
			US$	w/m	US$	w/m	US$	w/m
Output 1.2: Developing of monitoring capacity and linking of the research institutions and programs such as VNCPC on UP-POPs, POPs and other relevant toxic pollutant emissions in the country.	11-50	International short-term consultants	13,000	1.0	13,000	1.0	**26,000**	**2.0**
	17-50	National short-term consultants	12,000	6.0	12,000	6.0	**24,000**	**12.0**
	21-00	Subcontracts	150,000		70,000		**220,000**	
	45-00	Equipment	50,000				**50,000**	
Output 1.3: Harmonization of BAT/BEP reduction measures for UP-POPs with reduction measures for other environmental relevant pollutant releases	11-01	Chief Technical Advisor	7,000	1.0			**7,000**	**1.0**
Output 1.4 Development of information, education and communication (IEC) materials and implementation of IEC programmes	11-50	International short-term consultants	13,000	1.0	13,000	1.0	**26,000**	**2.0**
TOTAL OUTCOME 1			***245,000***	***9.0***	***108,000***	***8.0***	***353,000***	***17.0***
Output 2.1: Coordinating project activities with other national and regional programmes related to the BAT/BEP implementation	11-01	Chief Technical Advisor			7,000	1.0	**7,000**	**1.0**
	11-50	International short-term consultants	13,000	1.0	26,000	2.0	**39,000**	**3.0**
	17-50	National short-term consultants	12,000	6.0	12,000	6.0	**24,000**	**12.0**
Output 2.2: Survey and evaluation of international policies and regulations on UP-POPs and other pollutant releases from pertinent industrial source categories and their relationship and potential relevance for BAT/BEP measures	11-01	Chief Technical Advisor			7,000	1.0	**7,000**	**1.0**
TOTAL OUTCOME 2			***25,000***	***7.0***	***52,000***	***10.0***	***77,000***	***17.0***

Outputs	Budget line	Budget description	Year 1		Year 2		Total	
			US$	w/m	US$	w/m	US$	w/m
Output 3.1 Training on the monitoring of UP-POP chemicals in Vietnam for guiding and assessment of BAT/BEP projects	11-01	Chief Technical Advisor	7,000	1.0			**7,000**	**1.0**
	11-50	International short-term consultants	26,000	2.0	26,000	2.0	**52,000**	**4.0**
	17-50	National short-term consultants	16,000	8.0	16,000	8.0	**32,000**	**16.0**
	33-00	In-service training	15,000		35,000		**50,000**	
TOTAL OUTCOME 3			***64,000***	***11.0***	***77,000***	***10.0***	***141,000***	***21.0***
Output 4.1 Incremental cost estimation and cost-effectiveness evaluation for BAT/BEP implementations	11-50	International short-term consultants	13,000	1.0	13,000	1.0	**26,000**	**2.0**
Output 4.2 Compilation of incremental costs estimates at sector level for total cost estimates for BAT/BEP implementation at national level	11-50	International short-term consultants	13,000	1.0	13,000	1.0	**26,000**	**2.0**
Output 4.3 Evaluation of cost benefit of BAT/BEP options and comparison with environmental cost savings and improvement of occupational health and safety	11-50	International short-term consultants	13,000	1.0	13,000	1.0	**26,000**	**2.0**
Output 4.4 Development of incentives/rewards system for adopting BAT/BEP	11-50	International short-term consultants			13,000	1.0	**13,000**	**1.0**
Output 4.5 Developing financing mechanism and programmes for adopting BAT/BEP	11-50	International short-term consultants			13,000	1.0	**13,000**	**1.0**
TOTAL OUTCOME 4			***39,000***	***3.0***	***65,000***	***5.0***	***104,000***	***8.0***

Outputs	Budget line	Budget description	Year 1		Year 2		Total	
			US$	w/m	US$	w/m	US$	w/m
Output 5.1 Establish the project management structure	11-01	Chief Technical Advisor	7,000	1.0			**7,000**	**1.0**
	15-00	Project travel	7,000				**7,000**	
	17-50	National short-term consultants	20,000	10.0	20,000	10.0	**40,000**	**20.0**
Output 5.2 Design and implement and M&E mechanism according to GEF M&E procedures	11-50	International short-term consultants			13,000	1.0	**13,000**	**1.0**
	15-00	Project travel			8,000		**8,000**	
TOTAL OUTCOME 5			***34,000***	***11.0***	***41,000***	***11.0***	***75,000***	***22.0***
TOTAL PROJECT COSTS			***407,000***	***41.0***	***343,000***	***44.0***	***750,000***	**85.0**
TOTAL PPG							***50,000***	
GRAND TOTAL PROJECT COSTS (including PPG)							***800,000***	

E.2 Co-financing budget by Outputs (in US$)

Outputs	Co-financing (US$)		
	UNIDO	Government (MOI, MONRE/VEPA)	TOTAL
Output 1.1 Pilot projects for UP-POPs reduction in the sectors or waste incineration, cement kilns, pulp and paper production and secondary metallurgical industry	-	420,000	**420,000**
Output 1.2 Developing of monitoring capacity and linking of the research institutions and programs such as VNCPC on UP-POPs, POPs and other relevant toxic pollutant emissions in the country.	-	390,000	**390,000**
Output 1.3 Harmonization of BAT/BEP reduction measures for UP-POPs with reduction measures for other environmental relevant pollutant releases	-	60,000	**60,000**
Output 1.4 Development of information, education and communication (IEC) materials and implementation of IEC programs	-	40,000	**40,000**
TOTAL OUTCOME 1	**-**	**910,000**	**910,000**
Output 2.1 Coordinating project activities with other national and regional programs related to the BAT/BEP implementation	-	120,000	**120,000**
Output 2.2 Survey and evaluation of international policies and regulations on UP-POPs and other pollutant releases from pertinent industrial source categories and their relationship and potential relevance for BAT/BEP measures	-	20,000	**20,000**
TOTAL OUTCOME 2	**-**	**140,000**	**140,000**

Outputs	Co-financing (US$)		
	UNIDO	Government (MOI, MONRE/VEPA)	TOTAL
Output 3.1 Training on the monitoring of UP-POP chemicals in Vietnam for guiding and assessment of BAT/BEP projects	-	150,000	**150,000**
TOTAL OUTCOME 3	**-**	**150,000**	**150,000**
Output 4.1 Incremental cost estimation and cost-effectiveness evaluation for BAT/BEP implementations	-	75,000	**75,000**
Output 4.2 Compilation of incremental costs estimates at sector level for total cost estimates for BAT/BEP implementation at national level	-	30,000	**30,000**
Output 4.3 Evaluation of cost benefit of BAT/BEP options and comparison with environmental cost savings and improvement of occupational health and safety	-	75,000	**75,000**
Output 4.4 Development of incentives/rewards system for adopting BAT/BEP	-	25,000	**25,000**
Output 4.5 Developing financing mechanism and programmes for adopting BAT/BEP	-	35,000	**35,000**
TOTAL OUTCOME 4	**-**	**240,000**	**240,000**
Output 5.1 Establish the project management structure	24,000	80,000	**104,000**
Output 5.2 Design and implement and M&E mechanism according to GEF M&E procedures	16,000	30,000	**46,000**
TOTAL OUTCOME 5	**40,000**	**110,000**	**150,000**
GRAND TOTAL CO-FINANCING	**40,000**	**1,550,000**	**1,590,000**

SECTION F. MONITORING AND EVALUATION, REPORTING

Project implementation monitoring

Project Inception Phase

72. A project inception workshop will be conducted with the full project team, relevant government counterparts, co-financing partners, UNIDO and representation from the UNIDO Country Office (CO) and from the Vietnam National Cleaner Production Centre (VNCPC) as appropriate.

73. The fundamental objective of this Inception Workshop (IW) will be to assist the project team in understanding and assimilating the goals and objectives of the project, as well as to finalize preparation of the project's first annual work plan on the basis of the project's logical framework (logframe).

74. This work will include reviewing the logframe (indicators, means of verification, assumptions), imparting additional detail as needed, and completing an Annual Work Plan (AWP) for the first year of project implementation, including measurable performance indicators.

75. Additionally, the IW will: (i) introduce project staff to the UNIDO team which will support the project during its implementation; (ii) delineate the roles, support services, and complementary responsibilities of UNIDO staff vis à vis the project team; (iii) provide a detailed overview of UNIDO reporting and monitoring & evaluation (M&E) requirements, with particular emphasis on Annual Project Implementation Reviews (PIRs), the Annual Project Report (APR), as well as mid-term and final evaluations. Equally, the IW will provide an opportunity to inform the project team on UNIDO project related budgetary planning, budget reviews, and mandatory budget rephrasing.

76. The IW will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines and conflict resolution mechanisms. The Terms of Reference (TOR) for project staff and decision-making structures will be discussed, as needed, in order to clarify each party's responsibilities during the project's implementation phase.

Monitoring responsibilities and events

77. A detailed schedule of project review meeting will be developed by the project management team (PMT) in consultation with project implementation partners and stakeholder representatives and incorporated in the Project Inception Report. The schedule will include: (i) tentative time frames for Project Steering Committee (PSC) meetings (or relevant advisory and/or coordination mechanisms), and (ii) project related Monitoring and Evaluation activities.

78. Day to day monitoring of implementation progress will be the responsibility of PMT based on the project's Annual Work Plan and its indicators. PMT will inform UNIDO of any delays or difficulties faced during implementation so that appropriate support or corrective measures can be adopted in a timely and remedial fashion.

79. The National Technical Advisor (NTA) and Chief Technical Advisor (CTA) will fine-tune the progress and performance/impact indicators for the project in consultation with the full project team. Periodic monitoring of implementation progress will be undertaken by UNIDO or VNCPC, as appropriate through quarterly meetings with project counterparts. UNIDO, VNCPC and/or UNIDO Country office will conduct periodic visits based on an agreed upon schedule. Annual monitoring will occur through Project Steering Committee (PSC) meetings, which will take place at least once a year. The terminal review will be held in the last month of the project operation. PMT is responsible for preparation of the Terminal Review and submit it to UNIDO.

80. The National Technical Advisor (NTA), and the Chief Technical Advisor (CTA) will fine-tune the progress and performance/impact indicators for the project in consultation with the full project team at the Inception Workshop. Specific targets for first year implementation progress indicators together with their means of verification will be developed at this Workshop. These

will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the Annual Work Plan. Local/regional project management offices will also take part in the Inception Workshop. Targets and indicators for subsequent years will be reviewed annually as part of the internal evaluation and planning processes undertaken by the project team.

81. Measurement of impact indicators related to global benefits will be done according to the schedules defined in the Inception Workshop. The measurement of these will be undertaken through subcontracts or retainers with relevant institutions, or through specific studies that are to form part of the projects activities. Indicators of project goal, progress and performance will be continuously monitored and evaluated throughout the whole project life. Impact indicators to be measured include but not limited to:

- Number of institutions adopting BEP
- Number of facilities adopting BAT
- Number of adopting BAT/BEP
- Quantitative and qualitative change in the industrial solid waste disposed of
- Reduction of PCDD/PCDF emissions
- Avoid releases of PCDD/PCDF emissions
- Level of the stakeholder awareness of and participation in adopting BAT/BEP
- Levels of PCDD/PCDF in biological organisms in the vicinity of facilities adopted BAT/BEP
- Social and economic benefits from adoption of BAT/BEP

82. At least two inspections will be conducted by the representatives of the VNCPC during project implementation to determine the extent of adoption of BAT/BEP and supervise enforcement of relevant regulations, rules and standards.

83. Periodic monitoring of implementation progress will be undertaken by UNIDO or the VNCPC, as appropriate through quarterly meetings with project counterparts, or more frequently as deemed necessary. This will allow parties to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.

84. UNIDO, the VNCPC and/or UNIDO Country Office will conduct periodic visits based on an agreed upon schedule to be detailed in the project's Inception Report / Annual Work Plan to assess project progress. Other members of the PSC may also accompany these visits. A Field Visit Report will be prepared by UNIDO and circulated no less than one month after the visit to the project team and all PSC members.

85. Annual Monitoring will occur through PSC meetings, which will take place at least once a year. The first such meeting will be held within twelve months of the start of full project implementation. The PMO will prepare an Annual Project Report (APR) and submit it to UNIDO at least two weeks prior to the TPR for review and comments.

Terminal Review (TR)

86. The terminal review will be held in the last month of project operation. PMT is responsible for the preparation of the Terminal Review and submitting it to UNIDO. It shall be prepared in draft at least two months in advance of the TR in order to allow review, and will serve as the basis for discussions in the TR. The terminal review considers the implementation of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental objective. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as the vehicle through which lessons learned can be captured to feed into other projects under implementation or formulation.

Project Monitoring Reporting

87. PMT in conjunction with the PSC members will be responsible for the preparation and submission of the following reports that form part of the monitoring process. Items (a) through (f) are mandatory and are specifically related to monitoring, while items (g) through (h) have a broader function and the frequency and nature is to be defined throughout implementation.

(a) Inception Report (IR)

88. A Project Inception Report will be prepared immediately following the Inception Workshop. It will include a detailed First Year/ Annual Work Plan divided into quarterly time-frames detailing the activities and progress indicators that will guide implementation during the project's first year. This Work Plan will include the dates of specific field visits, support missions from UNIDO and VNCPC or UNIDO consultants, as well as timeframes for meetings of the project's decision-making structures. The report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, and including any monitoring and evaluation requirements to effectively measure project performance during the targeted 12 month time-frame.

89. When finalized, the report will be circulated to project counterparts who will be given a period of one calendar month in which to respond with comments or queries. Prior to this circulation of the IR, UNIDO will review the document.

(b) Annual Project Report (APR)

90. The APR is a UNIDO requirement and part of UNIDO central oversight, monitoring, and project management. It is a self -assessment report by project management to UNIDO, as well as a key input to the PSC. The APR will be prepared on an annual basis prior to the PSC to reflect progress achieved in meeting the project's Annual Work Plan and assess performance of the project in contributing to intended outcomes through outputs and partnership work.

91. The format of the APR is flexible but should include the following:

- Analysis of project performance over the reporting period, including outputs produced and information on the status of the outcome
- Constraints experienced in the progress towards results and the reasons for these
- Expenditure reports
- Lessons learned
- Recommendations to address key problems in lack of progress, if applicable.

(c) Project Implementation Review (PIR)

92. The PIR is an annual monitoring process mandated by the GEF. It is an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from ongoing projects. Once the project has been under implementation for a year, a PIR must be completed by the project team. The PIR can be prepared any time during the year (July-June) and ideally immediately prior to the PSC. The PIR should then be discussed at the PSC so that the result would be a PIR that has been agreed upon by project staff, the executing agency, and UNIDO.

93. The GEF M&E Unit provides the scope and content of the PIR.

(d) Quarterly Progress Reports

94. Short reports outlining main updates in project progress should be provided quarterly to UNIDO by the project team.

(e) Periodic Thematic Reports

95. As and when called for by UNIDO, the project team will prepare Specific Thematic Reports, focusing on specific issues or areas of activity. The request for a Thematic Report will be provided to the project team in written form by UNIDO and will clearly state the issue or activities that need to be reported on. These reports will be used as a form of lessons learned exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered.

(f) Project Terminal Report

96. During the last three months of the project, the project team based on the Terminal Review will prepare the Project Terminal Report (PTR). This comprehensive report will summarize all activities, achievements and outputs of the Project, lessons learned, objectives met (or not met), and structures and systems implemented. The PTR will be the definitive statement of the Project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's activities.

(g) Technical Reports

97. Technical Reports are detailed documents covering specific areas of analysis within the overall project. As part of the Inception Report, the project team should prepare a draft Reports List, detailing the technical reports that are expected to be prepared on key areas of activity during the course of the Project, and tentative due dates. Where necessary this Reports List will be revised and updated, and included in subsequent APRs. Technical Reports may also be prepared by external consultants and should be comprehensive, specialized analyses of clearly defined areas of research within the framework of the project and its sites. These technical reports will represent, as appropriate, the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national and international levels.

(h) Project Publication

98. Project Publications will form a key method of crystallizing and disseminating the results and achievements of the Project. These publications may be scientific or informational texts on the activities and achievements of the Project in the form of journal articles, multimedia publications, or other forms of distribution. Publications can be based on Technical Reports, or may be summaries or compilations of a series of Technical Reports and other research. The project team will determine if Technical Reports merit formal publication, and will also (in consultation with UNIDO, the government and other relevant stakeholder groups) plan and produce these Publications in a consistent and recognizable format.

Independent Evaluation

99. The project will be subjected to at least two independent external evaluations as follows:

- **Mid-term Evaluation.** An independent Mid-Term Evaluation will be undertaken at the end of the first year of project implementation. The Mid-Term Evaluation will measure progress made towards the achievement of outcomes and will identify corrections if needed. The evaluation will focus on the effectiveness, efficiency, and timeliness of project implementation; highlight issues requiring decisions and actions; and present initial lessons learned on project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the second half of the project's term. The organization, terms of reference, and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by UNIDO.
- **Final Evaluation.** An independent Final Evaluation will take place three months prior to the terminal tripartite review meeting, and will focus on the same issues as the mid-term evaluation. The final evaluation will also review impact and sustainability of results, including

the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by the UNIDO.

Audit Clause

100. The Government will provide the UNIDO Representative with certified periodic financial statements and with an annual audit of financial statements relating to the status of GEF funds according to the established procedures set out in the Programming and Finance manuals. The audit will be conducted by a legally recognized Government auditor, or by a commercial auditor engaged by the Government.

Indicative Monitoring and Evaluation Plan

Item	Responsible	Budget (US$)	Time Schedule
Quarterly Progress Reports and financial statement	UNIDO/VEPA	4,000	Quarterly
Project Implementation Reviews (PIRs)	UNIDO	3,000	Annual
Mid-term review report	UNIDO		After one year of the start of the project
Terminal evaluation report	Independent expert	10,000	At the end of the project
Financial audit report	Independent audit firm	4,000	At the end of the project
TOTAL		**21,000**	

Selected Impact indicators

Outcomes	Indicator	Target	Sources of Verification
Outcome 1: Capacity building of self-reliant managerial and technical personnel with professional competencies in applying BAT/BEP in priority industrial source categories to reduce UP-POPs releases	1. Technological units for process improvement and optimization in 4 selected pilot enterprises developed and in operation 2. Sampling and monitoring capacity established and monitoring programs of 4 pilot projects evaluated by expert 3. Number of managerial and technical employee reached by Capacity building activities	Reduction of UP-POPs and other targeted pollutant releases to acceptable release levels under the Stockholm Convention on POPs Sufficient number of laboratories with sampling and monitoring capacity At least one managerial and technical employee per participating pilot enterprise trained in applying BAT/BEP in priority industrial source categories to reduce UP-POPs releases	Reduction of UP-POPs and other targeted pollutant releases verified by measurements Project thematic study reports including reports on 4 BAT/BEP pilot projects Project technical reports Field inspection reports Project implementation review Project terminal report Project website Other relevant project documentation

Outcomes	Indicator	Target	Sources of Verification
Outcome 2: Enhanced efficiency in reducing, avoiding and eliminating UP-POPs releases and reducing releases of other pollutants by coordinating the implementation of the Stockholm Convention action plans with BAT/BEP activities in the industry on the national and regional scale and review and possibly improve national policies and regulations	1. Number of pilot projects that also relate to other national pollution reduction programs. 2. Steering group/project management team reports results of the project to the Chair of the Regional ESEA BAT/BEP Forum and participates in Forum meetings. 3. Criteria for policy and regulatory gap analysis is developed for industry sector with particular reference to selected 3 pilot source categories in the context of BAT/BEP.	All 4 pilot projects are linked to other national and regional pollution reduction programs. Participation of representatives of the PSC in all meetings of the ESEA BAT/BEP Forum during the implementation of the project. Policy and regulatory gap analysis report for industry sectors with particular reference to selected 3 pilot source categories in the context of BAT/BEP conducted and report published.	Project thematic study reports including reports on the BAT/BEP projects Project technical reports Field inspection reports Gap analysis report Project website Other relevant project documentation
Outcome 3: Capacity building for monitoring procedures for UP-POP chemicals as one key prerequisites for implementing BAT/BEP but also many other obligations of the Stockholm Convention	1. Educated experts in the field of the pilot projects 2. In plant training programs started 3. Trained national personnel is evaluated by international sampling expert	At least one technical employee per participating pilot enterprise trained in sampling and monitoring UP-POPs releases. Use of the trained technical staff of 4 pilot projects and as educational tool for in-plant training programs	Workshops conducted by Vietnamese experts BAT/BEP projects partly guided by Vietnamese experts Report of international expert on the quality of sampling team and the measurements. Project thematic study reports including reports on the BAT/BEP projects Project technical reports Field inspection reports Other relevant project documentation Project website
Outcome 4: A socio-economic development program established to address efficacy and efficiency of possible control measures in meeting risk reduction goals including incremental cost estimation for the implementation of BAT/BEP at enterprise level and sector level	1. Incremental cost and Cost/effectiveness calculation of BAT/BEP measures to be adopted in 4 selected pilot enterprises 2. Sectoral indicators for occupational health and safety in selected industrial sources	Incremental cost and Cost/effectiveness calculation carried out in all selected pilot enterprises Surveys for projected total cost estimate for countrywide BAT/BEP implementation undertaken in all 3 target sectors of the project Indicators for occupational health and safety adopted for all four target sectors of the project	Project thematic study reports Project technical reports Field inspection reports Medical records of employees of selected pilot enterprises Promotion and/or explanations on techno-economic policies promoting adoption of BAT/BEP and encouraging investment in BAT/BEP from private sector

	3. Number of techno-economic policies promoting adoption of BAT/BEP and encouraging investment in BAT/BEP from the private sector adopted	Policies promoting adoption of BAT/BEP and encouraging investment in BAT/BEP from the private sector adopted	Other relevant project documentation Project website
Outcome 5: Project management, monitoring and evaluation	1. Project monitoring management structure established 2. Project monitoring and evaluation procedures established	Establishment of Project Steering Committee and National Project Management Team Recruiting of technical experts to form the project expert team Training of all members of project management teams Holding Inception Workshop Issuing Inception Report Issuing Project Annual reports Holding review meetings Carrying out visits to operating facilities Preparing and issuing Project Terminal Report	Working rules of the Steering Committee TORs of the project management offices and staff Expert recruitment notices and TORs for the CTA, NTA, and the international and national experts TORs of the selected pilot enterprises Inception Workshop meeting minutes and report Annual Project Reports and Project Implementation Reviews Annual Steering Committee meeting minutes Mid-term and terminal external evaluation reports Terminal Report Annual project financial audit reports Field inspection reports MIS development documentations and reports generated by properly retrieving data and information from the MIS Project website development and maintenance documentations

SECTION G. PRIOR OBLIGATIONS AND PREREQUISITES

101. The Project Document will be signed by UNIDO and the Government of Vietnam. GEF assistance will be provided subject to UNIDO being satisfied that obligations and pre-requisites listed below have been fulfilled or are likely to be fulfilled. When fulfillment of one or more of these pre-requisites fails to materialize, UNIDO may, at its discretion, either suspends or terminates its assistance.

G.1 Prior to Project Effectiveness

102. Legally binding co-financing agreements are signed for participation in the project.

G.2 During project implementation

103. Quarterly Progress reports, annual Project Reports and Project Implementation Review reports as well as measure impact indicators should be prepared. The project work plan and consequently the budget will be updated annually.

G.3 Within one year of start of project implementation

104. Annual audited financial reports should be prepared and submitted to GEF.

SECTION H. LEGAL CONTEXT

105. The Project Document shall be the instrument referred to the Standard Basic Agreement between the Government of Vietnam and UNIDO. The project objectives shall be in line with objectives of the Policies of the Government of Vietnam.

106. The following types of revisions may be made to this Project Document with the signature of the Project Manager, provided he or she is assured that the other signatories of the Project Document has no objection to the changes as follows:

- Revision in, or in addition of, any annexes of the Project Document; and
- Revisions that do not involve significant changes in the immediate subcomponents, objectives, outcomes or activities of the project, but are caused by rearrangement of the inputs already agreed to or by cost increases due to inflation.

ANNEXES

Annex 1: Project Results Framework

Annex 2: List of 15 national priority programmes and projects on POPs

Annex 3: Existing POPs legislation in Vietnam

Annex 4: Summary of conducted POPs investigations

Annex 5: Unintentionally formed PCBs and HCB

Annex 6: National Strategy on Environmental Protection and Pollution Control

Annex 7: Inventory Summary Table

ANNEX 1: PROJECT RESULTS FRAMEWORK

Project Strategy Goal	Continuously minimize and, where feasible, ultimately eliminate the releases of unintentionally produced POPs and other globally harmful pollutants into the environment, and assist Vietnam implementing the relevant obligations under the Stockholm Convention to protect the global environment and human health		
Interventions	**Objectively Verifiable Indicators**	**Sources of Verification**	**Assumptions and Risks**
Objective: The overall objective of the Medium Size Project (MSP) is to establish the required human resources and infrastructure to implement the obligations of the Stockholm Convention in Article 5 "Measures to reduce and eliminate releases from unintentional production" and coordinate its activities with the national strategies for environmental protection and the national strategies for industrial and sustainable development and cleaner production and thus contribute to the improvement of human and environmental health.	➢ By 2010 the legal framework for countrywide adopting of BAT/BEP in line with the Stockholm Convention's requirements is established ➢ Reduction of UP-POPs in the selected pilot projects ➢ Roadmap for implementation of BAT/BEP measures in the selected sectors ➢ Harmonization of Stockholm Convention activities with general BAT/BEP implementation activities ➢ Documented monitoring capacity in the field of UP-POPs.	➢ Developed and monitoring capacity ➢ Documented BAT/BEP projects in key emission sectors ➢ Reduction of UP-POPs emission verified by measurements	➢ Continued government commitment ➢ Commitment by the industry ➢ Stakeholders' conflict of interest ➢ Co-financing support is not adequate and timely
Outcome 1: Capacity building of self-reliant managerial and technical personnel with professional competencies in applying BAT/BEP in priority industrial source categories to reduce UP-POPs releases			
Output 1.1 Pilot projects for UP-POPs reduction in the sectors of waste incineration, cement kilns, pulp and paper production and secondary metallurgical industry			
1.1.1 Pilot projects in sector of the secondary copper, secondary iron and steel industry (including sinter plants) and secondary aluminium 1.1.2 Pilot projects in the sector of waste incineration including municipal, hazardous and medical waste incinerators 1.1.3 Pilot project with cement kiln firing waste or hazardous waste 1.1.4 Pilot project with a pulp and paper mills using chlorine bleaching	➢ BAT/BEP projects in different waste incineration sectors conducted ➢ BAT/BEP projects in the secondary metal sector conducted ➢ BAT/BEP project in a cement kiln firing waste or hazardous waste conducted ➢ BAT/BEP project in the pulp and paper industry conducted	➢ Reduction of UP-POPs and other targeted pollutant releases verified by measurements ➢ Project thematic study reports including reports on the BAT/BEP projects ➢ Project technical reports ➢ Field inspection reports ➢ Other relevant project documentation ➢ Project website ➢ Master/PhD theses	➢ In all target industries appropriate pilot plants are identified and selected and the industry is willing to participate ➢ MOI ongoing program on reduction of dust and heavy metal where UP-POPs measures will be conducted ➢ UP-POPs sampling and analysis capacity is available

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 1.2: Developing of monitoring capacity and linking of the research institutions and programs such as VNCPC on UP-POPs, POPs and other relevant toxic pollutant emissions in the country.			
1.2.1 Design monitoring programs for UP-POPs releases in the pilot projects 1.2.2 Evaluation and introduction of international standard sampling procedures supported by appropriate capacity building. 1.2.3 Establishment of international contacts and collaborations 1.2.4 Conduct monitoring of UP-POPs in the pilot projects in accordance to their monitoring programs	➢ Sampling capacity established ➢ Guidance and evaluation from experienced monitoring expert provided ➢ Participation in intercalibration studies ➢ Monitoring results of the pilot projects evaluated by expert ➢ Established relationship to international laboratories.	➢ Evaluated monitoring data from the pilot projects by international expert ➢ Reports on results from intercalibration studies ➢ Project implementation review ➢ Project terminal report ➢ Project website	➢ Monitoring capacity for other pollutant emissions is available ➢ Educated monitoring staff is adequately compensated ➢ Resources for consumables for sample processing and measurements are available
Output 1.3 Harmonization of BAT/BEP reduction measures for UP-POPs with reduction measures for other environmental relevant pollutant releases			
1.3.1 To achieve efficiency, harmonize, by optimizing process parameters, the implementation of BAT/BEP for UP-POPs reduction with reduction measures for other relevant pollutant releases (especially dust and heavy metals).	➢ Technological units for process improvement and optimization in selected pilot enterprises developed and in operation	➢ Project thematic study reports ➢ Project technical reports	➢ Adequate monitoring capacities in operation and provide required data and information in time for process improvement and optimization ➢ Commitment of selected pilot enterprises to cooperate throughout the exercise
Output 1.4 Development of information, education and communication (IEC) materials and implementation of IEC programs			
1.4.1 Develop IEC materials for facilities and industries with processes releasing UP-POPs 1.4.2 Intensive communication and preparation of awareness-raising activities on BAT and BEP opportunities in the industrial sector 1.4.3 Raising awareness of general public on UP-POPs sources related to releases from common practices 1.4.4 Raising awareness of policy makers on specific BAT/BEP issues including waste management policies	➢ IEC materials prepared ➢ Workshops with the different industrial sectors conducted ➢ Number of stakeholders reached by awareness raising campaigns	➢ IEC materials ➢ Workshops with documented number of participants from the different industrial sectors ➢ Project thematic study reports including reports on the BAT/BEP projects ➢ Project technical reports ➢ Other relevant project documentation	➢ Qualified experts to prepare the IEC material ➢ Qualified team for the communication can be established ➢ Stakeholders are willing to participate in the awareness-raising activities ➢ Policy makers have interest in the topic

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Outcome 2: Enhanced efficiency in reducing, avoiding and eliminating UP-POPs releases and reducing releases of other pollutants by coordinating the implementation of the Stockholm Convention action plans with BAT/BEP activities in the industry on the national and regional scale and review and possibly improve national policies and regulations			
Output 2.1 Coordinating project activities with other national and regional programs related to the BAT/BEP implementation			
2.1.1 Coordinate BAT/BEP implementation with the National Strategy on Environmental Protection 2.1.2 Coordinate BAT/BEP implementation with other pollution reduction programs of the Vietnamese government and related cleaner production activities 2.1.3 Coordinate information exchange with the Chair of the Regional ESEA BAT/BEP Forum 2.1.4 Coordinate participation of universities and research institutions in the pilot projects (monitoring and engineering) 2.1.5 Development of the research capacities and programs on UP-POPs and coordinate them with research activities on POPs and other relevant environmental pollutant releases	➢ Number of pilot projects that also relate to other national pollution reduction programs ➢ Number of techno-economic studies on implementing BAT/BEP for overall release reduction of pollutants ➢ Steering group/project management team reports results of the project to the Chair of the Regional ESEA BAT/BEP Forum and participates in Forum meetings ➢ Research activities emerged by experience gained through the pilot projects	➢ Project thematic study reports including reports on the BAT/BEP projects ➢ Project technical reports ➢ Field inspection reports ➢ Other relevant project documentation ➢ Project website ➢ Documented research results on UP-POPs emissions in combination with other pollutants ➢ Master or PhD curricula on UP-POPs. ➢ Publications in scientific journals and/or presentations in national and/or international conferences.	➢ Close cooperation among government stakeholders ➢ Stakeholders' conflict of interest ➢ Competent guidance of the research at local University and support from experienced international researchers ➢ Qualified and dedicated students can be selected ➢ Research staff and PhD students are adequately compensated
Output 2.2. Survey and evaluation of international policies and regulations on UP-POPs and other pollutant releases from pertinent industrial source categories and their relationship and potential relevance for BAT/BEP measures			
2.2.1 Review international policies and regulations pertaining to UP-POPs with particular reference on regulations related to BAT/BEP. 2.2.2 Review implementation strategy and timelines of these policies and regulations in selected countries having already implemented the regulations for years or decades for specific installations and industries. 2.2.3 Analyze how would measures introduced to reduce UP-POPs air emission would additionally reduce other emissions of other organic (PAH, VOC) and inorganic compounds as well as particulates. 2.2.4 Design efficient approaches for harmonized implementation of BAT/BEP measures for total emission reduction of pollutants. 2.2.5 Coordinate activities with the National Strategy for the task to "Continue to complete and amend the legal system, mechanisms and policy in the sector of environmental pollution prevention and control" by carrying out a gap analysis for the lack of specific requirements in the policy and regulatory framework 2.2.6 Evaluation of options for enforcement	➢ Criteria for policy and regulatory gap analysis is developed for industry sector with particular reference to selected pilot source categories in the context of BAT/BEP ➢ Number of countries where policies and regulations related to UP-POPs and BAT/BEP reviewed ➢ Number of countries where enforcement measures evaluated ➢ Number of countries where policies and regulations related to industrial air emissions of particulates, organic and inorganic compounds reviewed	➢ International survey reports on BAT/BEP related policies and regulations as well as their enforcement ➢ International survey reports on industrial air emissions of particulates, organic and inorganic compounds related policies and regulations as well as their enforcement ➢ Gap analysis report ➢ Project thematic study reports ➢ Project technical reports	➢ The strengthening of legal system with particular reference to the environment related legislation is continued ➢ The Government is committed to develop and introduce new regulations recommended by the results of the gap analysis ➢ Information materials on the implementation strategies in other countries are available in time ➢ Implementation of the polluter pays principle

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Outcome 3: Capacity building for monitoring procedures for UP-POP chemicals as one key prerequisites for implementing BAT/BEP[11] but also many other obligations of the Stockholm Convention			
Output 3.1 Training on the monitoring of UP-POP chemicals in Vietnam for guiding and assessment of BAT/BEP projects			
3.1.1 Select engineers/technical personnel participating in the pilot projects for a training program on the sampling and monitoring of UP-POPs 3.1.2 Develop knowledge and experience in UP-POPs and BAT/BEP and the interrelation of UP-POPs reduction strategies with other relevant pollutant reduction strategies 3.1.3 Use the pilot projects and their experienced technical and managerial staff as educational tool for in-plant training programs	➢ Research programs in the field of UP-POPs established ➢ Educated experts in the field of the pilot projects ➢ Pilot projects lead by national experts ➢ In plant training programs started ➢ Trained national personnel is evaluated by international sampling expert	➢ Workshops conducted by Vietnamese experts ➢ BAT/BEP projects partly guided by Vietnamese experts ➢ Report of international expert on the quality of sampling team and the measurements. ➢ Project thematic study reports including reports on the BAT/BEP projects ➢ Project technical reports ➢ Field inspection reports ➢ Other relevant project documentation ➢ Project website	➢ Appropriate project personnel is identified and selected to participate in the project ➢ Commitment of selected pilot enterprises to cooperate throughout the exercise ➢ National experts adequately qualified can be identified for sampling ➢ Sufficient guidance from sampling expert
Outcome 4: A socio-economic development program established to address efficacy and efficiency of possible control measures in meeting risk reduction goals including incremental cost estimation for the implementation of BAT/BEP at enterprise level and sector level			
Output 4.1 Incremental cost estimation and cost/effectiveness evaluation for BAT/BEP implementations			
4.1.1 Develop incremental cost estimation methodology for BAT/BEP implementation at different industrial source categories 4.1.2 Review international experience of incremental cost calculation for BAT/BEP implementation 4.1.3 Develop a database for sources of BAT/BEP and international experiences on incremental costs calculation. 4.1.4 Compare international cost estimates for BAT/BEP implementation with the experiences gained from the implementation of the BAT/BEP pilot projects. 4.1.5 Perform incremental cost estimates on enterprise level for the different BAT/BEP options	➢ Incremental cost calculation methodology adopted ➢ Cost/effectiveness calculation methodology adopted ➢ Incremental cost calculation of adopting BAT/BEP measures in selected pilot enterprises ➢ Cost/effectiveness calculation of adopting BAT/BEP measures in selected pilot enterprises ➢ Database for BAT/BEP sources established and maintained	➢ Project thematic study reports ➢ Project technical reports ➢ Field inspection reports ➢ Other relevant project documentation ➢ Project website	➢ Sufficient data of (international) experience of incremental cost calculations in the different source sectors ➢ The incremental cost plant evaluations and also the international experiences give reasonable calculations for other plants in Vietnam ➢ Adequate and timely monitoring capacities in operation and provide required data and information for incremental calculations ➢ Adequate and timely monitoring capacities in operation and provide required data and information for cost/effectiveness calculations ➢ Commitment of selected pilot enterprises to cooperate throughout the exercise

[11] This is also a prerequisite for all activities in respect to future activities on PCB and Pesticide destruction and for contaminated site assessment.

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Output 4.2 Compilation of incremental cost estimates at sector level for total cost estimates for BAT/BEP implementation at national level			
4.2.1 Prepare a projection of cost estimate for countrywide introduction of BAT/BEP measures at sector level based on the experience gained through the pilot projects and international experiences	➢ Sectoral surveys for projected total cost estimate for countrywide BAT/BEP implementation ➢ Database for incremental cost estimate	➢ Project implementation review ➢ Project terminal report ➢ Project website	➢ The required nation-wide information on selected source categories are not available in time and/or insufficient
Output 4.3 Evaluation of cost benefit of BAT/BEP options and comparison with environmental cost savings and improvement of occupational health and safety.			
4.3.1 Evaluate cost benefit of BAT/BEP measures introduced to reduce UP-POPs 4.3.2 Compare the costs for implementation of the different BAT/BEP options at enterprise/facility level of the pilot project 4.3.3 Evaluate environmental cost savings by introducing BAT/ BEP measures 4.3.4 Assess improvement of occupational health and safety in pilot projects by introducing BAT/BEP measure	➢ Cost benefit calculation methodology adopted ➢ Simplified environmental accounting methodology adopted ➢ Sectoral indicators for occupational health and safety in selected industrial sources identified and adopted	➢ Project thematic study reports ➢ Project technical reports ➢ Field inspection reports ➢ Other relevant project documentation ➢ Project website ➢ Medical records of employees of selected pilot enterprises	➢ Adequate and timely monitoring capacities in operation and provide required data and information for cost/benefit calculations ➢ Familiarity and commitment of selected pilot enterprises to cooperate in environmental accounting throughout the exercise ➢ Full cooperation of health practitioner and/or hygienist to provide required occupational health and safety data
Output 4.4 Development of incentives/rewards system for adopting BAT/BEP			
4.4.1 Review existing reward system 4.4.2 Develop selection/merit criteria to facilitate and reward outstanding performance 4.4.3 Identify possible sources of reward/award	➢ Evaluation criteria for incentives developed and adopted for enterprises ➢ Selection criteria for rewards individual performance developed and adopted ➢ Number of incentives given to enterprises ➢ Number of rewards given to individuals	➢ Project implementation review ➢ Project terminal report ➢ Project website ➢ Management and human resources records at selected pilot enterprises	➢ Policies implementation is facilitated by proper incentives and reward system ➢ Stakeholders commitment to mobilize resources for maintaining incentives/reward system
Output 4.5 Developing financing mechanism and programmes for adopting BAT/BEP			
4.5.1 Review existing financial program for technology transfer 4.5.2 Conduct consultative meetings with implementing agencies for the development of financing program	➢ Techno-economic policies promoting adoption of BAT/BEP ➢ Policies encouraging investment in BAT/BEP from the private sector	➢ Promotion and/or explanations on techno-economic policies promoting adoption of BAT/BEP ➢ Promotion and/or explanation on policies encouraging investment in BAT/BEP from private sector ➢ Consultative meeting reports/minutes	➢ The established techno-economic policies can meet the BAT/BEP requirements and also respect the actual situation in Vietnam ➢ The national, municipal and provincial governments promote favorable conditions to attract private investment

Interventions	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
Outcome 5: Project management, monitoring and evaluation			
Output 5.1 Establish the project management structure			
5.1.1 Establish the Project Steering Committee by relying on resources from related ministries or agencies at the national level, and from local governmental agencies as appropriate 5.1.2 Establish the National Project Management Team under the Convention Implementation Focal Point 5.1.3 Recruit a Chief Technical Advisor (CTA, an international consultant), a National Technical Advisor (NTA), policy experts, technical experts in BAT/BEP and monitoring and research 5.1.4 Establish local project management nodules in selected provinces as appropriate 5.1.5 Carry out a series of management training courses to the national and local project management staff	➢ Steering Committee established ➢ National Project Management Team established with necessary office equipment procured ➢ National project expert team established ➢ International project expert team established ➢ Local project management offices or contacts in selected provinces established ➢ Project management capabilities improved at national and local levels	➢ Working rules of the Steering Committee ➢ TORs of the project management staff, including the project managers and technical support staff ➢ Expert recruitment notices and TORs for the CTA, NTA, policy experts, technical experts in sectoral BAT/BEP, monitoring, and evaluation experts ➢ TORs of the local project management offices ➢ TORs of the selected pilot enterprises ➢ Training materials on contractual management, project management tools, and basics of BAT/BEP and pollutants monitoring	➢ Various ministries agree on and support the project ➢ Coordination and cooperation can be achieved among various ministries and institutions ➢ Qualified project management staff can be recruited ➢ Qualified experts/specialists can be recruited ➢ The selected pilot enterprises have strong commitment for participation and cooperation ➢ Conflict of interest among stakeholder ➢ Provision of agreed co-financing resources and financial support in time
Output 5.2 Design and implement an M&E mechanism according to GEF M&E procedures			
5.2.1 Hold inception workshop 5.2.2 Prepare the inception report 5.2.3 Measure the impact indicators on an annual basis 5.2.4 Prepare the Annual Project reports and Project Implementation Reviews	➢ Inception workshop held ➢ Detailed workplans prepared ➢ Data and information against indicators input into the MIS ➢ Non-compliances identified and corrected	➢ Inception Workshop meeting minutes ➢ Inception Report ➢ Annual Project Reports and Project Implementation Reviews ➢ Annual Steering Committee meeting minutes	➢ The trained project management staff can well perform their jobs required in TORs
5.2.5 Hold annual Project Steering Committee meetings 5.2.6 Carry out mid-term external evaluation 5.2.7 Carry out final external evaluation 5.2.8 Complete the Terminal Report 5.2.9 Carry out annual project financial audits 5.2.10 Carry out visits to selected pilot sites at least twice a year 5.2.11 Establish a project management information system (MIS), including a project website to disseminate information to various stakeholders	➢ Technical and political guidance from the Steering Committee ➢ Experience summarized and recommendations raised ➢ Problems identified and recommendations provided by field visits ➢ MIS established and made functional ➢ Project information, experience and lessons disseminated through website	➢ Mid-term and terminal external evaluation reports ➢ Terminal Report ➢ Annual project financial audit reports ➢ Field inspection reports ➢ MIS development documentations and reports generated by properly retrieving data and information from the MIS ➢ Project website development and maintenance documentations	➢ Qualified external evaluation experts can be recruited ➢ No extreme weather conditions or other extreme events upon field visits ➢ Qualified IT service providers can be recruited to develop the MIS, including the project website ➢ A data and information collection mechanism among various stakeholders at different levels can be established to activate the MIS

ANNEX 2. LIST OF 15 NATIONAL PRIORITY PROGRAMMES AND PROJECTS ON POPs

1. Development and finalization of policies, legislation and institutions for POPs management

Implementing Agency: Ministry of Natural Resources and Environment
Collaborating Agencies: Relevant Ministries, sectors and provincial People's Committees
International Counterparts: SIDA, SDC, UNDP, WB
Implementation duration: 2006-2010
Priority Level: highest
Estimated cost: $1.9 million

Objective: Develop and finalize the system of policies, legislations and institution to create the bases for effectively managing, reducing and finally eliminating POPs until 2020.

Expected Outcomes:

- Institutional and organizational mechanisms for effectively implementing and coordinating POPs management are established in a coordinated and collaborative fashion;
- The system of policies and the legal framework for POPs management are enhanced and finalized.

Main Activities:

- Review policies and legal documents related to POPs in order to develop and finalize a synchronous system of policies and legal documents for POPs management, reduction, disposal and final elimination.
- Study and recommend options to finalize institutions, organizations, standards, technologies, and financing related to POPs.
- Study and develop the Law on Chemical Safety and legal documents for implementation of new policies and mechanisms on chemical safety.
- Develop a public participatory scheme for supervision and sound management of POPs.
- Review and assess the organizational scheme and coordination mechanisms related to POPs management.
- Develop and implement a project on consolidation and enhancement of capacity for the POPs management system.

2. Sound management, disposal and phase-out of POPs pesticides stockpiles

Implementing Agencies: Ministry of Agriculture and Rural Development, Ministry of Natural Resources and Environment
Collaborating Agencies: Ministry of Trade, General Department of Customs, Provincial People's Committees
International Counterparts: UNDP, SIDA, GEF
Implementation duration: 2006-2010
Priority Level: highest
Estimated cost: $ 1.3 million

Objective: The environmentally sound management and disposal of POPs pesticides stockpiles and waste

Expected Outcomes:

- Capacities of relevant central and local authorities and POPs treatment facilities are strengthened and monitored for safe treatment of POPs.
- POPs pesticides stockpiles are completely identified, collected, and temporarily stored in an environmentally sound manner.
- POPs pesticides stockpiles and wastes are safely and radically disposed.

Main activities:

- Undertake additional inventories and assessments of POPs contamination in POPs pesticide stockpile areas and develop an appropriate roadmap for disposing POPs pesticides stockpiles.
- Identify, collect, handle and soundly store POPs-containing pesticides and wastes for safe collection and disposal.
- Finalize, promulgate and disseminate regulations and technical guidelines for handling and disposal POPs pesticides.
- Collect and safely and completely dispose of POPs pesticides.

3. Sound management, disposal and phase-out of PCBs and PCBs-containing electrical equipment and industrial products

Implementing Agencies: Ministry of Industry, Ministry of Natural Resources and Environment
Collaborating Agencies: ENV, Relevant Ministries, sectors, Provincial People's Committees
International Counterparts: SDC, WB, SIDA, GEF
Implementation duration: Phase 1: 2006 – 2010; Phase 2: 2010 – 2020
Priority Level: high
Estimated cost: $44.8 million

Objective: Safely manage, dispose and phase-out PCBs and PCBs-containing electrical equipment and industrial products

Expected Outcomes:

- Nationwide use of PCB-containing oils and electrical equipment is controlled and managed.
- Safe and sound storage of PCB-containing waste oils and used equipment is ensured.
- PCB-contaminated waste oils and electrical equipment are radically treated.
- Safe and sound management of other industrial products is achieved.

Main Activities:

- Finalize, promulgate and disseminate regulations and technical guidelines for handling and disposal of PCBs and PCB-containing wastes.
- Develop capacity for rapid and exact analysis and assessment of PCB-containing oils and equipment. Undertake additional inventories of PCBs in existing equipment and electrical networks;
- Develop a roadmap for oil replacement and treatment of PCBs in existing electrical equipment.
- Assess PCB treatment capacity in Vietnam; Study and recommend measures for developing capacity for safe treatment of PCBs.
- Gradually treat and dispose PCBs and PCB-containing equipment in the electricity sector.
- Undertake inventories and assessments of other industrial products that contain PCBs; Develop and implement measures to manage those products safely.

4. Management of healthcare wastes to reduce POPs and other toxics releases

Implementing Agency: Ministry of Health, Ministry of Natural Resources and Environment
Collaborating Agencies: Relevant Ministries, sectors, urban environment companies, Provincial People's Committees
International Counterparts: UNDP, WHO, HCWH, SIDA, East Meets West, GEF
Implementation duration: 2006-2010
Priority Level: highest
Estimated cost: $25.4 million

Objective: Safely manage, reduce and treat healthcare wastes to prevent and eliminate the unintentional production of PCDD/PCDF and other toxic chemicals.

Expected Outcomes:

- The unintentional production of PCDD/PCDF and other toxic chemicals from healthcare wastes treatment in Vietnam is assessed.
- Models of management and treatment of hospital wastes to reduce PCDD/PCDF releases are developed, demonstrated and gradually replicated.
- Best available technologies and practices for healthcare waste treatment to prevent releases of PCDD/PCDF and other toxic chemicals are selected, demonstrated and gradually replicated.
- Awareness of healthcare wastes and skills on its handling are raised.

Main Activities:

- Survey the healthcare waste treatment situation in selected areas in Vietnam; assess releases of PCDD/PCDF and other toxic chemicals from healthcare waste treatment.
- Research and recommend best technologies and practices for healthcare waste treatment to prevent releases of PCDD/PCDF and other toxic chemicals.
- Demonstrate healthcare waste treatment models at central and local levels.
- Develop and implement training and awareness programmes on healthcare wastes and their handling.
- Develop and gradually implement a national replication plan.

5. Development of a national information system and working network on POPs, and promotion of stakeholder and public participation in the sound management of POPs

Implementing Agency: Ministry of Natural Resources and Environment
Collaborating Agencies: Relevant Ministries, sectors and provincial People's Committees
Implementation duration: 2006-2010
Priority Level: medium
Estimated cost: $3.5 million

Objective: Develop a national information system and working network for updating, exchange and management of information on POPs and associated chemicals and hazardous wastes, supporting the implementation of the Stockholm Convention in Vietnam.

Expected Outcomes:

- A national information system on POPs and associated chemicals and hazardous wastes that supports POPs management and is compatible with other national environmental information systems and relevant international information systems is established.
- Capacity of stakeholders from central to local levels for synthesis and management of POPs information is strengthened.
- A mechanism for collaboration among stakeholders on Stockholm Convention implementation is clarified and regulated for effective and rapid exchange and updating of POPs information.

Main Activities:

- Design an organization and collaboration mechanism among stakeholders in Stockholm Convention implementation in Vietnam, from which, an effective mechanism for updating, exchange and management of POPs information is developed.
- Design, develop and operate an information management system and database on POPs and associated chemicals and hazardous wastes, supporting POPs management and Convention implementation.
- Strengthen the capacity of stakeholders from central to local levels for synthesis and management of POPs information.
- Enhance a working network on POPs for stakeholders such as management agencies, research bodies, NGOs, environmental services, communities etc. in order to exchange

information and encourage and mobilize multi-stakeholder participation in Convention implementation.

6. Thorough isolation and treatment of hotspots contaminated with Dioxin and toxic chemicals sprayed by the US army during war in Vietnam

Implementing Agency: Ministry of National Defense
Collaborating Agencies: Ministry of Natural Resources and Environment, relevant Ministries, sectors and provincial People's Committee
International Counterparts: UNDP, IUCN, SIDA, GEF
Implementation duration: 2006-2010
Priority Level: highest
Estimated cost: $ 50.8 million

Objective: Effectively isolate, treat and environmentally restore the hotspots contaminated with Dioxin and toxic chemicals sprayed by the US army during war in Vietnam.

Expected Outcomes:

- Extent and levels of contamination and impacts of the chemicals used by the US army on the environment at hotspots are evaluated.
- Measures and models for environmentally sound and safe treatment and environmental restoration at hotspots are determined.
- Replication of measures and models.

Main Activities:

- Survey and evaluate the extent and levels of contamination and impacts of the chemicals used by the US army on the environment at hotspots; develop a roadmap for their treatment.
- Research and recommend measures and models for environmentally sound and safe treatment and environmental restoration at hotspots; Develop and demonstrate isolation and decontamination methods at selected hotspots.
- Replicate demonstrated models and measures.

7. Comprehensive treatment of PCBs and POPs pesticides contaminated hotspots

Implementing Agency: Ministry of Natural Resources and Environment
Collaborating Agencies: Relevant Ministries, sectors and localities
International Counterparts: UNDP, DANIDA, SDC, SIDA, GEF
Implementation duration: 2006-2010
Prioirity Level: highest
Estimated cost: $7.6 million

Objective: Identify and comprehensively treat PCBs and POPs pesticides contaminated hotspots, and reduce their impacts on human health and the environment.

Expected Outcomes:

- Extent and levels of contamination and impacts on the environment at PCB- and POPs pesticides-contaminated sites are evaluated.
- Measures and models for environmentally sound and safe treatment and environmental restoration at hotspots are recommended; Regulations and technical guidelines for hotspots treatment and management are developed and issued.
- Environmental management capacity for management and treatment of hotspots is built and sustained so as to minimize impacts on human health and the environment.
- Measures and models are replicated so as to treat all hotspots.

Main Activities:

- Survey and evaluate the extent and levels of contamination and impacts of PCBs and POPs pesticides on the environment at hotspots; develop a roadmap for their treatment.

- Research and recommend measures and models for environmentally sound and safe treatment and environmental restoration at hotspots; Develop and demonstrate isolation and decontamination methods at selected hotspots.
- Strengthen environmental management capacity regarding hotspots.
- Replicate demonstrated models and measures.

8. Study and development of emission and technological standards associated with POPs in line with development and integration needs

Implementing Agency: Ministry of Science and Technology
Collaborating Agencies: Ministry of Natural Resources and Environment
Implementation duration: 2006-2010
Priority Level: medium
Estimated cost: $ 0.4 million

Objective:

- Enhance capacity for scientific research and technological development on monitoring and safe treatment of POPs.
- Develop emission and technological standards associated with POPs treatment and monitoring.

Expected Outcomes:

- Programmes of research, analysis and assessment of POPs contamination are developed, together with enhanced technological capacity for safe treatment of POPs stockpiles and wastes.
- A complete set of environmental standards for the first 12 POPs are developed, together with selection criteria for technologies and practices to be used in order to manage and promote BAT and BEP to reduce unintentional production of POPs.

Main Activities:

- Implement programmes to develop capacity for analysis, monitoring and assessment of POPs contamination to fulfill the obligations of Stockholm Convention in Vietnam.
- Research and determine sound measures and technologies for safe treatment of POPs stockpiles and wastes.
- Develop and implement international cooperation programmes for research and development related to POPs and implementation of the Stockholm Convention.
- Develop a complete set of environmental standards for the first 12 POPs.
- Develop criteria and standards for technologies and practices in order to manage and promote BAT and BEP to reduce unintentional production of POPs.

9. Survey and study the impacts of POPs on human health and the environment in Vietnam

Implementing Agency: Ministry of Health
Collaborating Agencies: Ministry of Natural Resources and Environment
Implementation duration: 2006-2010
Priority Level: high
Estimated costs: $4.9 million

Objective: Understand the cause of diseases and other health impacts associated with POPs in order to prevent and reduce the consequences.

Expected Outcomes:

- Level of impact of POPs pollution on human health is assessed.
- Causes of diseases and other health impacts associated with POPs are understood and relevant measures for prevention and reduction of these impacts are established.

Main Activities:

- Develop programmes for enhancing capacity for POPs monitoring, and especially for assessment of biosamples.
- Survey and evaluate the level of impacts of each POP compound on human health throughout the chemical life cycle, and its distribution in the food chain.
- Develop and implement research programmes on the mechanisms through which POPs impact human health.
- Recommend measures for preventing and reducing POPs impacts on public health.

10. Development of technical capacity for POPs monitoring and analysis; Establishment of the network of internationally standardized laboratories for assessing pollution and impacts of POPs on human health and the environment

Implementing Agency: Ministry of Natural Resources and Environment
Collaborating Agencies: Ministry of Planning and Investment, and research bodies
Implementation duration: 2006-2010
Priority Level: high
Estimated cost: $ 2.7 million

Objective: Develop technical capacity for POPs monitoring and analysis; and establish a network of internationally standardized laboratories for assessing pollution and impacts of POPs on human health and the environment

Expected Outcomes:

- National infrastructure and capacity for POPs monitoring and analysis.
- International cooperation programmes for enhancing capacity and integration of research and development with respect to POPs.
- Network of Vietnamese laboratories capable of monitoring and analyzing POPs in Vietnam as well as participating in global POPs monitoring programmes.

Main Activities:

- Develop and implement a plan for strengthening national capacity for POPs analysis, with a focus on training sufficient competent human resources for POPs analysis in different environmental settings.
- Continuously develop laboratory infrastructure for POPs monitoring and analysis; develop a POPs sample bank.
- Establish national research and development programmes and projects on POPs.
- Enhance participation in international and global POPs monitoring and analysis programmes.

11. Assessment, study, promotion, assistance and management of the application of Best Available Techniques and Best Environmental Practices to reduce and finally eliminate the unintentional production of POPs from production and living activities

Implementing Agency: Ministry of Industry, Ministry of Natural Resources and Environment
Collaborating Agencies: Relevant Ministries, sectors and Provincial People's Committees
International Counterparts: UNIDO, UNDP, GEF
Implementation duration: Phase 1: 2006 - 2010; Phase 2: 2010 – 2020
Priority Level: high
Estimated cost: $ 10.3 million

Objective:

- Review the use of technologies that could reduce PCDD/PCDF emission in different industries; promote and support the application of BAT and BEP to reduce unintentionally produced Dioxins/Furans.
- Continuously reduce PCDD/PCDF from daily activities.

Expected Outcomes:

- Technologies that could reduce PCDD/PCDF emission in different industries have been reviewed and assessed.
- Guidelines on BAT and BEP appropriate for the national circumstances in Vietnam have been developed.
- Programmes for businesses, industries and communities to apply BAT and BEP to sustainably reduce PCDD/PCDF release sources have been promoted and supported.

Main Activities:

- Undertake additional surveys and assessment of the use of technologies that could reduce PCDD/PCDF emission in different industries; forecast industrial development trends and develop options and relevant roadmaps to promote BAT and BEP to reduce PCDD/PCDF releases sources.
- Develop and issue guidelines on BAT and BEP appropriate for the national conditions in Vietnam.
- Develop and apply standards for technologies and practices that have a high probability of releasing PCDD/PCDF; Enhance the supervision and application of environmental standards for PCDD/PCDF.
- Monitor unintentional production and release of PCDD/PCDF from technologies, as recommended by the Convention.
- Raise communities' awareness of elements of their lifestyle and habits that could potentially cause unintentional production of PCDD/PCDF, and options to reduce unintentional releases.

12. Updating surveys and assessments of POPs management in the whole country and reporting to the Government and the Secretariat for Stockholm Convention

Implementing Agency: Ministry of Natural Resources and Environment
Collaborating Agencies: Relevant Ministries, sectors and localities
Implementation duration: Phase 1: 2006 – 2010; Phase 2: 2010 – 2020
Priority Level: medium
Estimated cost: $ 2.9 million

Objective:

- Supervise assessments of the national situation regarding POPs.
- Evaluate the effectiveness of activities to implement the Stockholm Convention and regularly report to the Government and the Convention.

Expected Outcomes:

- POPs data is updated regularly.
- Regular reports are produced on the POPs situation in line with management requirements and obligations under the Convention.

Main Activities:

- Supervise and monitor the POPs situation in each locality, particularly in hotspots related to POPs stockpiles and contamination.
- Monitor and supervise the management and use of technologies that could unintentionally produce POPs in industries.
- Apply information management systems for POPs and associated chemicals and hazardous wastes to produce regular and accurate updates, and exchange and manage information on POPs.
- Evaluate the effectiveness of implementation of the Stockholm Convention in Vietnam.
- Compile reports on human health and environmental protection against POPs to submit to the Government and the Secretariat of the Convention.

13. Education, training and awareness raising on POPs issues

Implementing Agency: Ministry of Natural Resources and Environment
Collaborating Agencies: Ministry of Education and Training, relevant Ministries, sectors and Provincial People's Committees
International Counterparts: SIDA, SDC, UNEP, WB
Implementation duration: 2006-2010
Priority Level: high
Estimated cost: $ 1.1 million

Objective: Raise awareness and understanding within various target groups on POPs and their impacts on human health and the environment, contributing to the sound management of POPs and the reduction of their impacts.

Expected Outcomes:

- Active participation of NGOs and communities in supervision and sound management of POPs and reduction of their impacts.
- Enhanced awareness and understanding of POPs among target groups such as government, businesses, youth, women, peasantry, with a particular focus on POPs-exposed communities.

Main Activities:

- Develop media campaigns to inform and educate people on POPs and their impacts on human health and the environment.
- Organize workshops, training courses and seminars on POPs for selected target groups to develop a network of trainers or disseminators to extend coverage to other groups.
- Diversify various information dissemination options suitable for different target groups.
- Incorporate POPs information into common practices or programmes for the public, such as labor safety, food hygiene, production skills dissemination etc.

14. Enhancement of technical and financial support to implementation of the Stockholm Convention in Vietnam

Implementing Agency: Ministry of Planning and Investment.
Collaborating Agencies: Ministry of Natural Resources and Environment, Relevant Ministries and sectors
Implementation duration: 2006-2020
Priority Level: high
Estimated cost: $ 1.7 million

Objective: Ensure the necessary resources to implement the NIP in Vietnam in harmony with national socio-economic development programmes.

Expected Outcomes:

- Financial and technical resources to implement the NIP are mobilized and allocated adequately and reasonably.
- Activities to implement Stockholm Convention to protect human health and the environment against POPs in Vietnam are incorporated effectively into national and local socio-economic development programmes.

Main Activities:

- Balance and arrange Governmental budget allocations for implementation of the Convention.
- Promote bilateral and multilateral cooperation to mobilize international resources for implementation of the Convention.
- Set priorities and incorporate activities to implement the NIP into national and local socio-economic development programmes.

15. Strengthening capacity for managing and controlling the production, import-export, use and transport of prohibited chemicals including POPs in Vietnam

Implementing Agency: Ministry of Trade
Collaborating Agencies: General Department of Customs, MARD, MONRE, Ministry of National Defense, Ministry of Security, Provincial People's Committees
International Counterparts: SIDA, SDC, UNEP, WB
Implementation duration: 2006 – 2010
Priority Level: high
Estimated cost: $ 2.5 million

Objective: Ensure the necessary capacity within competent and relevant authorities for implementation of, and effective collaboration on obligations for the sound management of POPs and associated toxic chemicals.

Expected Outcomes: Capacity of competent and relevant authorities for identifying and controlling of POPs are enhanced to fulfill the obligations for the sound management of POPs and the implementation of the Stockholm Convention.

Main Activities:

- Evaluate the management capacity of competent and relevant authorities for implementation of the Stockholm Convention in Vietnam.
- Develop appropriate training programmes to strengthen the capacity of relevant authorities such as the General Department of Customs (Ministry of Finance), the Market Management Department (Ministry of Trade), the Plant Protection Department (Ministry of Agriculture and Rural Development), the Department of Science and Technology (Ministry of Industry), provincial Departments of Trade, provincial Departments of Natural Resources and Environment, etc.
- Implement training programmes at central and local levels.
- Harmonize the working and organization mechanisms of competent and relevant authorities to enhance the efficiency of collaboration on management and control of POPs and their impacts.

ANNEX 3: EXISTING POPS LEGISLATION

The key policies and legal provisions for management of chemicals and hazardous wastes, including POPs are:

- Resolution 41/TW dated 15th November 2004 on "Environmental Protection in the industrialization and modernization of Vietnam" and the Governmental implementation program for Resolution 41/TW: Create a firm policy and direction to enhance environmental protection. Ministries, sectors and localities have developed specific implementation programmes for Resolution 41/TW, including environmental pollution prevention and degradation recovery, wastes (including hazardous wastes) management and raising of awareness of and responsibility for environment and human health protection.
- The Law on Environmental Protection (1993) and Amended (2005). The Law on Environmental Protection affirms that environmental protection is the responsibility of the whole population. The basic principle of environmental protection is to seek to prevent environmental degradation, pollution and incidents. The use of chemicals, chemical fertilizers and pesticides, as well as wastes treatment should comply with the legislation. The Law on Environmental Protection (2005) more specifically regulates hazardous wastes management and pollution prevention.
- The National Strategy on Environmental Protection (2003) consists of thirty six national programmes covering all fields of environmental protection, including hazardous wastes management, application of environmentally friendly technologies and environmental pollution (including pesticides pollution) treatment and recovery.
- The National Plan on Environment and Sustainable Development (1991) and Orientation for Sustainable Development in Vietnam (Agenda 21 - 2004) provide specific requirements for the sound management of chemicals and hazardous wastes.
- The Plan for thoroughly handling establishments which cause serious environmental pollution (2003), ratified in Decision 64/2003/QD-TTg dated 22nd April 2003 is now under implementation. It contains regulations on penalties for violation of environmental standards, and defines appropriate policies and mechanisms for facilities that need to be closed or removed. According to this plan, 439 facilities of this type must be closed by 2007, some of which are contaminated by POPs pesticides.
- The Law on Population Health Protection (1989) specifies that people have the right to live healthily. Any activities that cause adverse impacts to the environment and human health should be minimised, eliminated or carefully controlled.
- The Ordinance on Plant Quarantine and Protection (2001) unifies the management of the production, export, import, maintenance, storage, transport, trade and use of pesticides. MARD has the responsibility for management of pesticides through the organization of registration, the issuance of permits, and publishing the lists of permitted pesticides, restricted pesticides and prohibited pesticides in Vietnam.
- The Decree on Chemical Safety (2004) and Law on Chemicals (in preparation, 2006): there seventeen provisions dealing with the sound management and treatment of hazardous wastes/toxic chemicals.
- Hazardous Waste Management Regulations (1999) regulate all stages of the hazardous wastes life-cycle, including their production, transportation, storage, treatment and final disposal. Regulations on permits for collection, transport, storage, treatment and disposal are relatively specific. However, the application of these regulations is difficult due to lack of human capacity, equipment and a lack of clarity in some articles. Although these regulations are applied to all POPs, there is no clear distinction between POPs and other wastes.
- The Strategy for the Management of Municipal Solid Waste (1999) and Regulations on the Management of Solid Waste Landfills (2004), issued by MOC contain regulations on sanitary landfilling of solid wastes (including hazardous wastes). However, landfilling is not the best disposal method for POPs because they are highly toxic and persistent, even at low concentrations.

- Decision 328/2005/QD-TTg dated 12th December 2005 of the Prime Minister on approving the national plan on environmental pollution control till 2010, has set up the objectives of the management of wastes and waste sources, enhancement of the capacity for wastes treatment and implementation of international treaties related to pollution control to which Vietnam is a Party. The national plan on environmental pollution control presented nineteen priority projects, plans and programmes. The implementation of these priority plans and projects will cooperate with and support the sound management, reduction and elimination of POPs.
- Directive 29/1998/CT-TTg on enhancing the management of pesticides and POPs provides specific regulations on POPs management and assignment for line ministries and sectors. different tasks according to their functions and responsibilities.
- Decision 1970, 1971, 1972/QD-BKHCNMT dated 10th November 1999 of MOSTE, on treatment technology for prohibited pesticides stockpiles, includes guidelines on pesticide (including POPs) disposal. However, there has not been any assessment of the application of these guidelines in relation to POPs pesticides treatment.
- Decision 60/2002/QD-BKHCNMT dated 07th August 2002 of MOSTE, on publishing the technical guidelines on hazardous wastes landfilling, contains technical guidelines on landfilling of chemicals and hazardous wastes (including pesticides and POPs).
- Some specific regulations on POPs are found in Vietnamese Standards: TCVN 5938:1995, TCVN 6560:1999, TCVN 6984:2001, TCVN 5941:1995, TCVN 5507:1991, TCVN 6774: 2000, TCVN 6984: 2001, TCVN 6985: 2001.
- Decree 80/2006/ND-CP on the enforcement of, and financial penalties related to, environmental protection includes regulations on the trade, export-import, transport and treatment of wastes, including POPs. Procedures are defined for determination of penalties, and jurisdiction for their application is assigned to chief inspectors specialized in environment, presidents of wards, and districts, towns, provinces and cities.
- Circular 08/2001/TT-BCN dated 14th September 2001 issued a List of Conditionally Exported and Imported Toxic Chemicals and their Products. This provided the basis for the prohibition by the Electricity of Vietnam Corporation of the import of PCBs-containing equipment by all its members.
- Vietnam has defined the functions and responsibilities of ministries and sectors, including chemicals and hazardous wastes management (in particular) and environmental protection (in general). Furthermore, for multi-sectoral tasks and responding to particular conditions, the Government has issued supplementary regulations that modify the functions of, establish regulatory and cooperative relations among, and determine the responsibilities of relevant stakeholders for specific tasks and objectives (for example: Directive 29/1998/CP-TTg on “Enhancing the Management of the Use of Pesticides and POPs”, and Directive 13/2005/CT-TTg on “Promoting the Management of Solid Wastes in Municipal and Industrial Areas”).

ANNEX 4: SUMMARY OF CONDUCTED POPS INVESTIGATIONS

There have been several POPs monitoring programmes carried out in Vietnam as cooperative research projects between Vietnam and international research institutes. These include:

- Analysis of POPs pesticides residues (DDT, HCH, PCBs, HCL, HCB) in migrant and residential birds, cooperative research between Centre for Chemical Technology and Sustainable Development (Hanoi National University, Vietnam) and Ehime University, Japan.
- Monitoring of DDT, HCH, PCBs, HCL, HCB residues in mussels and fishies in some coastal areas of Vietnam (1997-1999): a research program “Asia-Pacific Mussel Watch” implemented by Marine Environment Centre, Ehime University, Japan.
- Some analytical activities of the OCP (Organochlorine Pesticides) residues in water and sediment in some areas such as West Lake (Hanoi), Ba Be Lake (Bac Kan province), Red River, Ba Lat estuary, Ha Long Bay, some rivers in the central provinces, and a fluvial bog (Hue), implemented by the Centre for Chemical Technology and Sustainable Development (Hanoi National University, Vietnam) within the framework of environmental monitoring of hydrosphere in West Asia supported by United Nations University (since 1998).
- Research on DDT and PCBs residues in sediment and water of some canals in Hanoi and some Northern coastal areas (1994-1999), implemented by the Vietnam National Institute of Nuclear Energy, The Quality Assurance and Testing Centre 1 (Quatest 1, Directorate for Standards and Quality, Ministry of Science and Technology), the Portugal National Institute of Nuclear Energy and the Marine Environment Laboratory of the Monaco Institute of Nuclear Energy. This collaborative research project was organized by the International Atomic Energy Agency.
- A Ministerial research project on “Investigating the POPs pollution situation in the Hanoi area” (Ministry of Science and Technology), carried out by the Analytical Laboratory of the Quality Assurance and Testing Centre 1, Directorate for Standards and Quality.
- Some research projects on POPs residues in soil and plants, implemented by the Institute of Plant Protection, MARD.
- Monitoring program on pesticide residues implemented by Department of Plant Protection, MARD.
- A national research project (KHCN.07.15) on identification of toxic pollutants released from industrial and urban activities and development of appropriate treatment technologies, implemented by the Vietnam-Russia tropical centre.
- A project on assessing Dioxin stockpiles in military airport areas which were used as Dioxin storages in the war in Vietnam, implemented by Vietnam-Russia tropical centre.
- Analysis task in Programme 33, implemented by Vietnam-Russia tropical centre, in cooperation with other agencies such as: VEPA, Institute of Biological Technology, Centre for Environmental Treatment Technology – Chemical Military Headquarter etc.
- Some cooperative projects with the USA, Canada, the Netherlands etc., on the movement and adverse impacts of Dioxin derived from toxic chemicals used by the US Army during the war in Vietnam.

This review of POPs monitoring programmes in Vietnam indicates that POPs monitoring activities in Vietnam has been, as yet, limited. With the exception of some research programmes on Dioxin and toxic chemicals used by the US Army, research projects on POPs in Vietnam have not been implemented systematically with a focus on relatively short periods of time (3-6 years) and covering limited areas.

ANNEX 5. UNINTENTIONALLY PRODUCED PCBs and HCB

PCBs and HCB are listed in the Stockholm Convention as industrially produced POPs. In addition, the Convention lists PCBs and HCB as unintentionally formed POPs, together with the PCDD/PCDF. Therefore the industrially produced PCBs and HCB have to be treated in accordance with Article 3 of the Convention, while the unintentionally produced PCBs and HCB have to be reduced together with PCDD/PCDF in accordance with Article 5 of the Convention. Therefore the unintentionally formed PCBs and HCB are separately treated from the industrial produced PCBs and HCB.

Unintentionally produced PCBs and HCB are formed through most industrial processes in parallel to PCDD/PCDF. Therefore the source categories for PCDD/PCDF release described in the PCDD/PCDF inventory are at the same time the sources for unintentionally formed PCBs and HCB. Furthermore the PCDD/PCDF, PCB and HCB[12] have similar chemical and physical properties. Therefore PCBs and HCB are reduced in a similar way if PCDD/PCDF are reduced. This justifies to use the PCDD/PCDF inventory as base for the BAT/BEP process for the whole range of unintentionally formed POPs (UP-POPs) and to treat all four UP-POPs together in the BAT/BEP processes of reduction measures.)

High amount of HCB can be formed in some processes of the chemical industry (e.g. PVC production) and are not covered by the PCDD/PCDF inventory. These processes need to be additionally addressed in this respect.

[12] HCB has a higher volatility and a higher stability compared to PCDD/PCDF and PCBs. Therefore it has to be considered that BAT countermeasures like adsorption technology and catalytic oxidation result in lower destruction removal efficiency compared to PCDD/PCDF (see e.g. T. Sakurai, R.Weber, S.Ueno, J.Nishino, M. Tanaka. Relevance of Coplanar-PCBs for TEQ Emission of Fluidized Bed Incineration and Impact of Emission Control Devices. Chemosphere, 53, 619-625 (2003).)

ANNEX 6. NATIONAL STRATEGY ON ENVIRONMENTAL PROTECTION AND POLLUTION CONTROL

In the preparation of this NIP, attention has been paid to the need to integrate planning to eliminate the dangers posed by POPs with the broader agenda of development planning. The majority of the activities and priority programmes identified below have close links with existing governmental strategies, and in particular, with:

1. *The National Strategy on Environmental Protection until 2010 and towards 2020:*

The Strategy, developed in 2003, is an extremely important guiding instrument for the country's environmental protection work until 2020. The Strategy for Environmental Protection is an inseparable part of the National Socio-economic Development Strategy, and provides the groundwork for sustainable development of the country. Environmental protection investment means the investment for sustainable development.

Among the Specific Objectives of the Strategy are several that are directly related to the NIP. These include:

- 100% of the newly constructed production units must adopt clean technologies or be equipped with pollution mitigation and wastes treatment facilities meeting environmental standards.
- 40% of urban centres, 70% of industrial parks and export-processing zones will be provided with wastes treatment systems that measure up to environmental standards; 90% of domestic, industrial and service solid wastes to be collected, and 60% of collected hazardous wastes and 100% of collected medical wastes to be treated.
- Chemical safety must be strictly controlled, particularly for highly toxic chemicals. The production and use of chemical fertilizers and pesticides that cause environmental pollution must be strictly restricted, and the use of integrated pest management measures must be strengthened.
- Industries that seriously pollute the environment across the country will be dealt with in accordance with the Prime Minister of the Government Decision 64/2003/QD-TTg.
- Resolve Agent Orange/Dioxin contaminated hotspots.

The Strategy includes 36 "Priority Programmes", which are divided into several levels of priority. Amongst these, 8 are related directly to the contents of the NIP, in which, 4 are ranked in the highest priority. The 8 programmes are:

- MT.PK1 Resolving industries that seriously pollute the environment; Rank: Highest; Target completion: 2012.
- MT.PK2 National hazardous wastes treatment; Rank: Highest; Target completion: 2010 for 1st phase.
- MT.PK3 Medical wastes treatment; Rank: Highest; Target completion: 2010 for 1st phase.
- MT.KP2 Remedy of environmental consequences caused by the American chemical warfare; Rank: Highest; Target completion: 2010.
- MT.PK4 Solid wastes management capacity and efficiency improvement in urban and industrial areas; Rank: Higher; Target completion: 2010 for 1st phase.
- MT.PK5 Cleaner production and Environmentally friendly technology adoption in Vietnam; Rank: High; Target completion: 2010.
- - MT.PK6 Incentives for enterprises in environmental protection and international economic integration; Rank: High; Target completion: 2010 for 1st phase .
- MT.PK7 Development and implementation of environmentally friendly technology innovation road-map; Rank: High; Target completion: 2010.

2. The Plan on Radical Treatment of Environmentally Polluting Hotspots (2003), ratified in Decision 64/2003/QD-TTg dated 22 April 2003

In the initial stage of the plan (up to the end of 2007), efforts will be concentrated on dealing with 51 establishments of particular concern, including 29 production and business establishments, 3 toxic chemical storage zones, 1 wartime bomb warehouse, and 3 rubbish dumps. At the same time, technologies at 55 production and business establishments will be upgraded, pollution treatment systems will be established at 49 former and existing rubbish dumps, and environmental pollution will be dealt with at 84 hospitals. These plans address some of the key objectives of priority programmes 4 (Management of healthcare wastes), 7 (Treatment of contaminated hotspots), and 11 (Application of BAP and BET), described in Annex 1.

In the second stage of the plan, another 3,856 establishments, which cause serious environmental pollution, will be dealt with, and standards for new establishments will be tightened. This is related to the same 3 priority programmes, as well as priority programme 8 (Development of standards).

3. The National Strategy on Pollution Control

This is a National Strategy developed in 2005 to direct the key actions in the area of pollution prevention and control identifying 9 tasks and 19 priority projects, of which the following tasks are related to the POPs management issues:

- Task 1. Continue to complete and amend the legal system, mechanisms and policy in the sector of environmental pollution prevention and control such as: policy to promote pollution reduction, waste collection, transportation, treatment, reuse, recycle and environmental remediation; mechanisms for information dissemination on environmental pollution to the community including waste tax and fees policy; regulation for enterprises self monitoring and reporting to the environmental agency; develop environmental waste standards and discharge standards at sectoral and national levels and technical guidelines on environmental pollution prevention and control.
- Task 2. To follow up all regulations on environmental impact assessment reports for all development plans, programmes and projects; to implement environmental standards registration for all productions units and services which are using natural resources or generating waste to the environment; enforce post EIA activities for development projects.
- Task 3. To survey and take inventory of all sources, nature and load of pollution throughout the country, for each sector and province, focusing on hazardous waste and sources of waste. Based on these databases, carry out pollution prevention and control at the sources and set up a plan for the minimization and treatment of waste.
- Task 4. To develop a national database on pollution source, nature and load; disseminate all information concerning pollution and treatment to the community; provide appropriate mechanisms for public participation in environmental pollution prevention and control activities.
- Task 4. Develop and complete monitoring network following the national plan for environmental monitoring. In the coming year prioritize on setting up monitoring centres and monitoring points at critical economic zones. Link information between the monitoring centres and monitoring points with the national network.
- Task 5. Planning and development of infrastructure for waste collection and treatment; prioritize the development of hazardous waste treatment centres and storage points; pre-treatment and recycling of solid waste; collection and treatment of liquid waste in urban and industrial areas.
- Task 6. To control trans-boundary pollution focusing on pollution prevention and control for trans-boundary river and marine pollution. Enhance the control of waste and old technology transportation from abroad to Viet Nam.
- Task 7. To effectively implement the Basel Convention on trans-boundary transportation of hazardous waste and their disposal and the Stockholm Convention on persistent organic pollutant (POP) and other conventions to which Viet Nam is a party.