PROJECT IDENTIFICATION FORM (PIF) [1]

PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND:GEF Trust Fund

PART I: PROJECT IDENTIFICATION

Project Title:	Implementation of eco-industrial park initiative for sustainable industrial zones in Vietnam		
Country(ies):	Vietnam	GEF Project ID:[2]	4766
GEF Agency(ies):	UNIDO	GEF Agency Project ID:	
Other Executing Partner(s):	National executing agencies: Ministry of planning and investment (MPI)	Submission Date:	18/08/2011
GEF Focal Area (s):	Multi-focal areas	Project Duration (Months)	36
Name of parent program (if applicable): ➢ For SFM/REDD+ ☐		Agency Fee ($):	**352,400**

A. FOCAL AREA STRATEGY FRAMEWORK[3]:

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Indicative Grant Amount ($)	Indicative Co-financing ($)
CCM-1	Technologies successfully demonstrated, deployed and transferred.	Innovative low-carbon technologies demonstrated and deployed on the ground.	GEFTF	780,000	6,873,000
CCM-1	Enabling policy environment and mechanisms created for technology transfer.	National strategies for the deployment and commercialization of innovative low-carbon technologies adopted.	GEFTF	150,000	184,000
IW-1	Innovative solutions implemented for reduced pollution and improved water use efficiency.	Types of technologies and measures implemented in local demonstrations and investments.	GEFTF	460,000	2,591,000
IW-2	Innovative solutions implemented for reduced pollution of coasts.	Types of technologies and measures implemented in local demonstrations and investments.	GEFTF	260,000	2,291,000
CHEM-1	POPs releases to the environment reduced.	Action plan addressing un-intentionally produced POPs under development and implementation.	GEFTF	987,000	869,000
CHEM-3	Contribute to the overall objective of the SAICM of achieving the sound management of chemicals throughout their life-cycle in ways that lead to the minimization of significant adverse effects on human health and the environment.	Implementation of SAICM relevant activities incl. addressing chemicals of global concern on a pilot basis.	GEFTF	719,000	669,000
		Sub-Total		3,356,000	13,477,000
		Project Management Cost[4]	GEFTF	168,000	674,000
		Total Project Cost		**3,524,000**	**14,151,000**

B. PROJECT FRAMEWORK

[1] It is very important to consult the PIF preparation guidelines when completing this template.
[2] Project ID number will be assigned by GEFSEC.
[3] Refer to the reference attached on the Focal Area Results Framework when filling up the table in item A.
[4] GEF will finance management cost that is solely linked to GEF financing of the project.

Project Objective: Increased transfer, deployment and diffusion of clean technologies and practices for the minimization of hazardous waste, GHG emissions as well as water pollutants and the sound management of chemicals in industrial zones (IZ) of Vietnam.						
Project Component	**Grant Type**	**Expected Outcomes**	**Expected Outputs**	**Trust Fund**	**Indicative Grant Amount ($)**	**Indicative Cofinancing ($)**
1. Improvement of policy and guidelines to facilitate the transformation of industrial zones (IZ) into eco-industrial parks (EIP)	TA	-Regulations on management and planning of industrial zones adjusted. -Adoption of regulations and guidelines by regulatory authority to enable sustainable operation of industrial zones. -Increased access to clean&low-carbon technology funds for IZ companies.	-Review of industrial zones regulations finalized. -Documentation on improvements and extensions of existing regulations developed. -Information on core elements of eco-industrial parks disseminated to regulatory authority	GEFTF	150,000	184,000
2. Capacity building on eco-industrial park (EIP) strategy and measures	TA	-Improved capacity of policy decision makers, IZ management boards, investors and industry associations. -New investments into clean&low-carbon technology and industrial practices fostered. -Environmental impact of industrial zones significantly lowered.	-Completed training programs for MONRE, MPI, MOIT, IZ management boards, industry associations and selected companies. -Formed closer partnership between IZ management boards and IZ companies. -Extended cooperation between IZ companies. -Improved enforcement of regulatory mechanisms for IZ management and application of low-carbon and resource efficient technologies and practices	GEFTF	370,000	538,000
3. Identification and implementation of eco-industrial parks (EIP) pilot projects	TA	-Level of optimization potential determined in three industrial zones. -Needs in neighbouring communities assessed. -Development of strategy for adaptation and deployment of key clean&low-carbon technologies.	-Three pilot industrial zones selected in the North, Centre and South of Vietnam. -Formed partnerships between public agencies, management boards and IZ companies. -Representative number of companies assessed in resource efficiency and cleaner production and technology gap determined. -Strategic plans at IZ level for inter-company collaboration on reuse and recycling of materials, energy and water developed. -Inventory of clean&low-carbon technology needs in IZ completed and best available technologies (BAT) and best environmental practices (BEP) identified -Documentation on the needs assessment of and resources in	GEFTF	1,336,000	1,000,000

			neighbouring communities that will be served by a community enhancement program. -Needs of IZ management boards to adapt to new EIP structure/requirements assessed and support completed.			
4. Financing scheme for clean&low-carbon technology application in industrial zones (IZ) and community enhancement	Inv	-Several clean&low-carbon technology projects implemented through financing from local banks. -Several community enhancement projects implemented. -Access to alternative technology finance established.	-Documentation on the financial feasibility of the identified technology projects completed. -Financial requirements of clean&low-carbon technology projects reported to banks and alternative finance institution. -Clean&low-carbon technology investment projects developed and implemented. -Indicators developed and environmental stress reduction achieved and measured. -Community enhancement projects developed and implemented. -Financing scheme for clean&low-carbon technology investment projects widely promoted to banks, IZ companies and governmental institutions.	GEFTF	1,300,000	11,455,000
5. Information dissemination on eco-industrial park (EIP) initiative	TA	-Reduced GHG emission, water pollutants and hazardous waste from the pilot IZ. -Numerous replication investments in clean&low-carbon technology in other IZ. -Integration of public authority and community in EIP projects consolidated.	-Installed clean&low-carbon technology application demonstration. -Monitoring documentation of the environmental, economic and social benefits. -Communication plan for dissemination of the demonstration results in the three pilot IZ. -Documentation on and publication of the completed pilot projects incl. engineering and financing information. -Knowledge shared under the IW Learn mechanism.	GEFTF	200,000	300,000
			Sub-Total		3,356,000	13,477,000
			Project Management Cost[5]	GEFTF	168,000	674,000
			Total Project Costs		**3,524,000**	**14,151,000**

[5] Same as footnote #3.

C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, ($)

Sources of Cofinancing	Name of Cofinancier	Type of Cofinancing	Amount ($)
GEF Agency	UNIDO (bilateral aid of seco)	Grant	1,000,000
GEF Agency	UNIDO	In-kind	250,000
Bilateral Aid Agency (ies)	Green Credit Trust Fund (GCTF) of seco	Grant	3,000,000
National Government	MPI	In-kind	300,000
Private sector	Industrial zone enterprises (Investments)	Grant	3,000,000
Private sector	Industrial zone enterprises	In-kind	300'000
Others	Vietnam Environment Protection Fund (VEPF)	Soft Loan	2,200,000
Others	Vietnam Environment Protection Fund (VEPF)	Grant	722,000
Others	National Technology Innovation Fund (NATIF)	Soft Loan	500,000
Private sector	Techcombank, VIB, ACB	Hard loan	2,879,000
Total Cofinancing			**14,151,000**

D. GEF/LDCF/SCCF RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY[1]

GEF Agency	Type of Trust Fund	Focal Area	Country Name/Global	Grant Amount (a)	Agency Fee (b)[2]	Total c=a+b
UNIDO	**GEF TF**	**Climate Change**	**Vietnam**	**976,500**	**97,650**	**1,074,150**
UNIDO	**GEF TF**	**International Waters**	**Vietnam**	**756,000**	**75,600**	**831,600**
UNIDO	**GEF TF**	**Persistent Organic Pollutants**	**Vietnam**	**1,791,500**	**179,150**	**1,970,650**
Total Grant Resources				**3,524,000**	**352,400**	**3,876,400**

[1] In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table

[2] Please indicate fees related to this project.

PART II: PROJECT JUSTIFICATION

A. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

A.1.1 the GEF focal area/LDCF/SCCF strategies:

The reason for using a multi-focal area project for implementing cleaner production and technology transfer lies in the multi-faceted nature of environmental problems in companies of industrial zones (IZ). Most measures are not for single focal areas, but several are affected simultaneously. In addition, different focal areas can be complementary. The promotion of innovative energy-efficient technologies, for example, may lead to efficient water usage and/or UPOPs reduction. When implementing cleaner production and clean&low carbon technologies, the measures and their effects should be assigned to different focal areas and a multi-focal area project approach adopted.

The project is in line with the GEF5 multi-focal strategies and fits into following objectives:

Climate change:

GEF 5 CCM-Objective No. 1: "Promote the demonstration, deployment, and transfer of innovative low-carbon technologies"

Under the selected CCM-Objective No. 1 the project aims at the deployment and **diffusion of innovative low-carbon technologies** not yet present in Vietnam for energy cascading, inter-plant energy flows and production process re-design in pilot companies of the selected industrial zones through investment and local capacity building. By waste heat recovery and low-carbon heat generators fossil fuel for power generation will be reduced and GHG emissions substantially avoided.

The GEF support will also involve the demonstration, deployment, and transfer of **priority technologies** identified by Vietnam that are commercially available but have not been adopted in their particular industries.

Beside the technical component the project will contribute to the adaptation and enforcement of regulations on industrial zone planning and management **enabling the future transfer of innovative low-carbon technologies** to industrial zones.

The proposed project is in alignment with:

- The Draft Technology Needs Assessment for GHG abatement in the industry sector in Vietnam (TNA, 2005)

  The draft TNA selected and examined only three priority industries due to time limitations, their energy consumption and high GHG emissions. Among these industries are cement, steel and construction materials. The TNA emphasizes that other industries that play an important role in the process of national industrialization and modernization are being investigated. The detailed TNA with these further industries is expected to be finalized in May 2012. According to the draft TNA the private sector is being developed quickly, the companies are more flexible but lack of capital for technology investments. Moreover a serious barrier for technology transfer is the lack of information on clean&low-carbon technologies. These TNA concerns will be addressed by the proposed eco-industrial park initiative.

- The priority areas identified in Vietnam's National Communication (NC) to the UNFCCC submitted in 2010

  According to the NC the Vietnamese economy has a low efficiency in the use of raw materials, fuel and energy. This is due to the use of old and outdated equipment and technology and the inadequate management of energy utilization. Outdated and/or incompatible technologies are used in the cement, steel and construction materials industries but also in pulp and paper production, food processing such as brewing industry, soft drink production and fish processing that lead to high GHG emissions. Moreover there is strong need of capacity building in technology development and transfer. The proposed eco-industrial park initiative corresponds to the concerns of the NC.

- Vietnam's GEF National Portfolio Formulation Document (NPFD)

International waters:

1) GEF 5 IW-Objective No. 1: "Catalyze multi-state cooperation to balance conflicting water uses in trans-boundary surface and groundwater basins while considering climatic variability and change"

2) GEF 5 IW-Objective No. 2: "Catalyze multi-state cooperation to rebuild marine fisheries, and reduce pollution of coasts and Large Marine Ecosystems (LMEs) while considering climatic variability and change

The project concentrates on two **transboundary surface water basins**, the Mekong and Red river deltas as well as on the **Large Marine Ecosystem** in Danang region and the Gulf of Tonkin in the South China Sea. Through the application of new technologies for closed water loops and water cascading in industrial zone industries **water use efficiency** will be improved and **groundwater sources preserved**. Moreover through the substitution of raw materials minimization of transboundary toxic water pollutants will be achieved contributing to **reduced land-based pollution** of large marine ecosystems (LME) and surface water as well as reduced intoxication of transboundary vital fish-species.

The proposed project will lead to significant **stress reduction** on international eco-systems in the transboundary river basins (Mekong and Red river, surface and groundwater) and the South China Sea (marine living resources incl. fish stocks). Consequently both GEF 5 international waters objectives, IW-1 and IW-2, are applied for the proposed initiative. Therefore, the project is in alignment with the priorities identified in Sustainable Development Strategy for the Seas of East Asia (2003), Strategic Action Programme for the South China Sea (2008), and Mekong Water Resources Assistance Strategy (2006).

Chemicals:

1) GEF 5 CHEM-Objective No. 1: Phase out POPs and reduce POPs releases

2) GEF 5 CHEM-Objective No. 3: Pilot sound chemicals management and mercury reduction

The project seeks to reduce the release of **un-intentionally produced POPs** (dioxins and furans) from industrial activities in the selected three pilot industrial zones through the application of BAT and capacity building on BEP for existing and new sources and the wide dissemination of results to other industrial zones. Among the relevant sources for dioxins in the industrial zones will be waste incineration, pulp production, aluminum/copper/zinc recycling, steel recycling, cement production and industrial coal/oil fired boiler systems. Moreover **PCB compounds** used in industry as heat exchange fluids and in electric transformers will be addressed.

With regard to un-intentionally produced POPs the project links the activities with the GEF 5 climate change objective No. 1 on the transfer of innovative low-carbon technologies.

Selected companies in industrial zones will be supported in achieving **sound management of chemicals** of global concern as stipulated in the SAICM policy framework. Special emphasis is put on technology transfer and pollution prevention through materials substitution as well as on waste minimization and disposal. Furthermore dangerous existing contaminated sites of industrial activity will be identified and means for monitoring or remediation will be developed.

A.1.2. For projects funded from LDCF/SCCF: the LDCF/SCCF eligibility criteria and priorities:

N.A.

A.2. National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NIPs, PRSPs, NPFE, etc.:

The proposed project is in line with the relevant national programs and policies stated in the "**Proposed National GEF Portfolio in Vietnam 2010-2014"** that represents Vietnam's National Portfolio Formulation Exercise Document (NPFE). Particularly, the project is consistent with and addresses the selection criteria, as well as the following guiding policies and national priorities for the use of GEF 5 funds, identified by Vietnam in its NPFD:

- National Strategy for Environmental Protection until 2010 and Vision Toward 2020:

  National priority: Promote demonstration and transfer of innovative low carbon technology in goods production and waste heat utilization.

- National Target Program on Efficient Use and Saving Energy (EUSE)

  National priority: Demonstrate, develop legal framework and mechanisms to promote energy efficiency in industry

- National Strategy on Water Resources Toward the Year 2020:

  National priority: Types of technologies and measures implemented for reduced pollution and improved water use efficiency in Mekong and Red river deltas through multi-state cooperation. National and local policy and institutional reforms adopted/implemented for joint ecosystem-based and adaptive management for LMEs

- National Implementation Plan (NIP) Priority Program 8:

  National priority: Enhancement of the BAT/BEP application in one or two major industrial source categories (waste incineration and iron&steel production) to reduce unintentionally produced POPs releases.

- National Implementation Plan (NIP) Priority program 2,3,4,5,6,9:

  National priority: Environmentally sound chemical and waste management of POPs-contaminated wastes planned and implemented.

Additionally, the project is in alignment with:

- The Draft Technology Needs Assessment for GHG abatement in the industry sector in Vietnam (TNA, 2005)

  The draft TNA selected and examined only three priority industries due to time limitations, their energy consumption and high GHG emissions. Among these industries are cement, steel and construction materials. The TNA emphasizes that other industries that play an important role in the process of national industrialization and modernization are being investigated. The detailed TNA with these further industries is expected to be finalized in May 2012. According to the draft TNA the private sector is being developed quickly, the companies are more flexible but lack of capital for technology investments. Moreover a serious barrier for technology transfer is the lack of information on clean&low-carbon technologies. These TNA concerns will be addressed by the proposed eco-industrial park initiative.

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in pulp and paper production, food processing such as brewing industry, soft drink production and fish processing that lead to high GHG emissions. Moreover there is strong need of capacity building in technology development and transfer. The proposed eco-industrial park initiative corresponds to the concerns of the NC.

- Priorities identified in the National Implementation Plan (NIP) under the Stockholm Convention on Persistent Organic Pollutants (GEF/UNDP, MONRE, 2006).
- Sustainable Development Strategy for the Seas of East Asia (2003)
- Strategic Action Programme for the South China Sea (2008)
- Mekong Water Resources Assistance Strategy (2006)

Finally, following reports, decrees and laws require actions as outlined in the proposed project (referred to in the PIF):

[1] Decision 183/2004/QD-TTg issued on 19 October 2004 – Financial support from the central state budget to technical infrastructure investment in IZs in localities with difficult socio-economic conditions

[2] Law No. 52/2005/QH11 approved by National Assembly on 29 November 2005 – Law on Environmental Protection

[3] Law No. 2008/QH 12 approved by the National Assembly on 21 November 2007 – Law on Chemicals

[4] Decree No. 59/2007 issued on 9 April 2007 – Management of solid wastes

[5] Decree No. 88/2007 issued on 28 May 2007 – The water drainage in IZs and urban areas

[6] Decree No. 29/2008/ND-CP issued on 14 March 2008 – Specification of the establishment, operations, policies and state management of IZs, PZs, economic zones and border gate economic zones

[7] Decision No. 1107/2006/QD-TTg issued on 21 August 2008 – Approval of industrial zone development planning in Vietnam up to 2015 and orientation to 2020

[8] Decision No 1440/QD-TTg issued on 6 October 2008 – Master plan for installation of solid waste treatment systems in major economic areas of North, Central and South Vietnam

[9] Decree No. 120/2008/ND-CP issued on 1 December 2008 – River Basin Management

[10] Decision No: 158/2008/QD-TTg issued on 2 December 2008 - Approval of the National Target Program to respond to climate change

[11] Decree No. 120/2008/ND-CP issued on 1 December 2008 – River Basin Management

[12] National State of Environment report 2009, Vietnam Industrial Zone Environment, MONRE, 2009

[13] Circular No. 08/2009/TT-BTNMT issued on 15 July 2009 – Regulations on environment management and protection in economic areas, modern technology areas, industrial areas and industrial parks

[14] Decision No. 1419/QD-TTg issued on 7 September 2009 – Cleaner industrial production until 2020

[15] Decision No. 2149/QD-TTg issued on 27 December 2009 – National strategy for comprehensive management of solid wastes until 2025, with a vision to 2050

[16] Law No. 50/2010/QH12 approved by the National Assembly on 17 June 2010 – Law on Energy Efficiency and Conservation

[17] Decision No. 4103/QD-BCT issued on 3 August 2010 - Action plan on response to climate change of the ministry of industry and trade

[18] Draft report of Danang industrial and export processing zones authority issued in October 2010 - Construction of concentrated wastewater treatment and environmental protection works at industrial zones

[19] Industrial pollution management in Nhue-Day and Dong Nai rivers watershed, MPI, 2011

[20] Water Environment Partnership in Asia (WEPA) under the initiative of the Ministry of the Environment of Japan, 2011

[21] Clean production and Energy Efficiency Poject, GEF/WB, 2011

[22] Vietnam National Implementation Plan for Stockholm Convention on Persistent Organic Pollutants, GEF/UNDP, MONRE, 2006

B. PROJECT OVERVIEW:

B.1. Describe the baseline project and the problem that it seeks to address:

Vietnam has experienced sustained rapid economic growth over the last ten years mainly driven by widespread growth in the processing and manufacturing sectors. Government entities have created industrial development zones to facilitate the establishment of new industries with the provision of infrastructure like utility, water and effluent treatment. At the beginning of 2011 an estimated 260 industrial zones (IZ) exist in Vietnam located in 56 provinces from which 173 were put into operation. The Vietnamese government approved a master plan for the period 2006-2015 that targets on the establishment of 115 new industrial zones and the expansion of 27 existing ones resulting in an overall area of more than

700 km^2. In total 458 km^2 are industrial land for rent (January 2011). Most IZ are located in the important economic areas of the country (Southern Vietnam 124, Central Vietnam 23, Northern Vietnam 52). Industrial zones contribute significantly to the development of the national economy that has showed an average annual GDP growth rate of 7% during the last years. Industrial zones make up 26% of the total export value of the country and 38% of the country's GDP. Industrial zones therefore significantly contribute to drawing investments into the country, especially foreign investments. The socio-economic importance is also reflected in the number of jobs created. Industrial zones employed 1.17 million staff by the beginning of 2009.

The industrial growth in Vietnam has brought about adverse change in environmental quality. Basic environmental legislation is in place nevertheless, instruments and practices have not been sufficiently made available to lower the environmental impact so far. Approximately 70% of waste water from industrial zones is directly discharged in the water receivers without any treatment causing severe pollution of surface water as well as large marine ecosystems and negative impact on agriculture, aquaculture and on the supply of drinking water. The total solid waste from industrial zones has steadily increased in the recent years. The proportion of hazardous solid waste amounts 20% of the total, the amount of recyclable waste is very high. At present the collection, transportation, recycling and reuse of the solid waste from industrial zones is insufficient. Air pollution is concentrated on industrial zones with enterprises using obsolete technologies or not equipped with air emission treatment systems. Moreover outdated technologies for energy intensive processes in industrial zones excessively emit greenhouse gases and contribute to climate change.

Environmental pollution has greatly influenced human health of the communities living near IZ resulting in economic losses in terms of health care service fees and lower income. The annual economic loss to people living in the areas influenced by contaminating plants is usually 3.5 times as high as that in areas without such influences. Employees directly exposed to contaminated environment in IZs often show occupational hazards such as pneumoconiosis, bronchitis and hazards caused by chemicals [12]. The environmental management of industrial zones is rather weak and their development often shows limited awareness of environmental issues. In order to reach the country's objective of continued sustainable economic growth actions beyond classic environmental protection measures are required.

The large number of industrial zones in Vietnam makes the development of these into eco-industrial parks (EIP) very desirable. Improving the environmental, social and economic performance of companies at this scale would make a significant contribution to the companies and park management, to neighbouring communities and to sustainable development. By working together, the EIP community of manufacturing and service businesses located together on a common property seeks a collective benefit that is greater than the sum of individual benefits each company would realize by only optimizing its individual performance. The goal of an EIP is to improve the economic performance of the participating companies while minimizing their environmental impacts. Components of this approach include green design of park infrastructure and plants (new or re-engineered), cleaner production, energy efficiency and inter-company partnering. An EIP also seeks benefits for neighbouring communities to assure that the impact of its development is positive. The EIP is a point of leadership and leverage for change in its region's and national industrial community. A park seeking to become an eco-industrial park can act as a hub of a national eco-industrial network through its own improvement projects and through the connections of its factories with suppliers and customers outside the estate's border. (ADB, EIP, E.A. Lowe 2005).

It was identified that scaling-up and extending resource efficient and cleaner production through industrial parks is a necessity in Vietnam [12]. The consideration of unique opportunities to combine enterprise level initiatives to reduce waste and emissions with collective opportunities to recover and reuse wasted by-products lags behind the development of new industrial zones. Thus, the present project aims at transforming existing industrial zones into EIP through Cleaner Production, Resource efficiency and Exchange of by-products and energy.

National finances and knowledge of appropriate environmental protection measures, particularly in the areas of climate change, waste water management and chemicals management are also limited in Vietnam. Reducing greenhouse gases, effluent treatment and safe chemicals use represent a major challenge particularly for SME. The reasons for this, amongst other things, lie in a lack of awareness of new, environmentally-friendly technologies and practices as well as in insufficient framework conditions (finance, legislation). Although a national environmental policy as well as the relevant legislation has been developed in recent years, these are highly fragmented and need to be improved in order to be effective.

Baseline Projects:

Previously, the Vietnamese government reacted to the situation by implementing various action programmes related to the need for optimising industrial processes, which were broad-based and not restricted merely to industrial zones. These action programmes were and will be implemented without regard to the GEF project proposed here and represent the baseline project, in order to reduce the afore-mentioned environmental problems. Numerous action programmes have ended in the meantime, with the broad implementation of environmental protection measures in industry not yet being achieved. The completed, nationally-significant industrial cleaner production activities included the "Development cooperation in environment (DCE)" programme with a cleaner production component (2005-2010), which was implemented by the Ministry of Industry and Trade (MOIT), the "Promoting Resource Efficiency in Small and Medium-sized Enterprises" project, supported by UNEP (2009 - 2010) as well as, in the product optimisation sector, the "Cleaner production for better products" project, which was supported by the European Union (2007-2009).

Current significant programmes include the five-year project "Vietnam Provincial Environmental Governance Project (VPEG)" (2009-2013), which focuses on the application of industrial pollution prevention strategies and the implementation of industrial pollution management (IPM) provisions in companies at provincial level. An important element of this is training authorities' representatives, allowing VPEG to support the Ministry of Natural Resources and Environment (MONRE) in improving IPM policy and the legal framework conditions. The project's specific focus is the planning, budgeting and management of public resources destined for environmental protection, supporting industrial pollution prevention measures (such as cleaner production) and enforcement of legislation in the industrial pollution sector. Most activities are designed to improve the skills and responsibilities of law enforcement agencies, such as MONRE and DONRE.

At present the Ministry of Planning and Investment (MPI) is implementing a project on industrial pollution management in Nhue-Day and Dong Nai rivers watershed [19]. This initiative is targeted on capacity building for provincial government on strengthening environmental compliance of industries.

To implement the Prime Minister's Decision approving the National Target Programme to Respond to Climate Change [10], the Ministry of Industry and Trade (MOIT) has taken initiative in coordinating bodies in and outside the ministry, national and international consultants to develop an Action Plan on responding to climate change for the Ministry of Industry and Trade [17]. With the function of management relating to the industrial and trade sector, MOIT has also been assigned by the government the task of taking the lead in implementing the National Target Programme on the "Economical and Efficient Use of Energy" and the "Biofuel Development until 2015, with vision towards 2025" scheme. The outcomes of the action plan between now and 2015 will contribute to increasing the capacity to adapt to climate change and minimise greenhouse gas emissions, thus practically implementing National Target Programmes in industrial and trade operations. Specifically, the action plan encompasses, besides the identification of climate change risks to some key industrial and trade sectors, the control of greenhouse gas emissions in industrial production processes and trade activities. Furthermore, the action plan requires the transfer of green, climate-friendly technologies to energy-intensive sectors like steel, chemicals, metallurgy etc. on the basis of calling for international assistance in terms of financial resources and technologies and the deployment of the technologies in selected demonstration projects. The action plan specifically calls for increasing and diversification of funding sources for the implementation especially from international supporting programmes, as funds from the state budget are not sufficient to support relevant technology investments and capacity building.

Vietnam's government launched the Vietnam National Energy Efficiency Program (VNEEP) for the period 2006–2015, which was prepared by the Ministry of Industry and Trade (MOIT). The VNEEP is a national target program, and the first comprehensive plan for improving energy efficiency and conservation (EE&C) in all sectors of the economy in Vietnam. Despite initiatives for energy efficiency from both the government and donor side, significant barriers remain such that many energy-saving opportunities remain unexploited. The government's support under the VNEEP for key industries to improve, upgrade and optimize technologies aimed at energy saving and efficiency remains challenging. Many industrial enterprises do not consider energy efficiency a priority due to lack of awareness of the potential savings as well as the available technologies. They tend to carry out minimal or low cost energy efficiency measures while focusing on capacity expansion to modernize their operations and improve competitiveness and profitability. To the extent that they are aware of opportunities for larger energy savings, they tend to shy away from risks associated with these due to insufficient in-depth knowledge and expertise [21].

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. In 2004, under the UNDP/GEF NIP preparation project, an inventory and assessment of unintentional production sources of POPs in Vietnam was conducted. This task relied on cooperation among various relevant authorities, localities, consultants and domestic and international experts. Data were analyzed by cities/provinces and then integrated by regions. There are 2,130 likely Dioxins/Furans release sources in Vietnam. By sector, the proportions are production of minerals (29%), ferrous and non-ferrous metal production (25%), production and use of chemicals and consumer goods (5.5%), heat and power generation (17%) and waste incineration (9.5%). 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. UNIDO has supported these efforts by initiating the project "Introduction of BAT and BEP methodology to demonstrate reduction or elimination of unintentionally produced persistent organic pollutants (UP-POPs) releases from the industry" which was finalized in 2010. According to the NIP the sector-wide introduction of BAT/BEP is planned to be completed by 2020. The priority for the application of BAT/BEP to reduce and finally eliminate the unintentional production of POPs from production activity stated in the NIP is high. Equally high priority has the sound management, disposal and phase-out of PCBs and PCB-containing electrical equipment and industrial products until 2020 according to the NIP [22].

Further supporting strategies of UNIDO in the region are as follows:

UNIDO launched the programme on "**Green Industry for a Low-Carbon Future**", a strategy to support green industrial growth in the developing world. Based on European experience the programme encompasses the development of policy instruments aimed at raising resource efficiency on the level of companies and products that foster economic growth and international competitiveness.

In addition UNIDO's programme on **resource efficient and cleaner production** (**RECP**) worldwide and particularly in Vietnam forms a strong baseline for the proposed GEF project. RECP builds upon cleaner production in accelerating the application of preventive environmental strategies to processes, products and services to increase efficiency and reduce risks to humans and the environment. During project development UNIDO will support the project team in consulting with relevant projects under the RECP and international energy conservation projects with regard to the transformation of IZ.

UNIDO started **cleaner production activities already in 1996 in Vietnam** and launched the **Vietnam Cleaner Production Centre (VNCPC)** by the end of the 90's. In the meantime the VNCPC has grown to a national centre of excellence recognized by the national and international stakeholders and successfully operating in its field of activities that can provide relevant local support to this GEF project in terms of awareness raising, finance, training and technical assistance.

The proposed GEF project is therefore fully in line with UNIDO's strategies and the related declarations adopted by Asian countries including Vietnam.

B. 2. incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

Currently, around 70% of the effluent from industrial zones in Vietnam (around 1 million m^3/day) enters the discharge system directly and untreated. The consequence of this practice is increased pollution in surface and ground water as well as marine ecosystems due to toxic substances, with negative consequences for agriculture, pisciculture and the provision of drinking water. Especially the rapid industrialization in coastal areas has contributed to the deterioration of coastal water quality. More than 2000 fish species are found in the sea waters of Vietnam. Of these, approximately 130 species are economically important for neighboring countries. The dominating land based source of pollution to the coastal environment and its transboundary fish resources is the discharge from the river and sewage systems. Beside organic pollutants a significant flux of heavy metals can be observed [20]. The pollution sources have not been curbed, weakening the competitiveness of Vietnam as well as neighboring countries' sea products.

The average proportion of hazardous waste as part of the whole is very high (20%, approx. 470k t/a) and its disposal in municipal landfill sites presents a high risk of groundwater pollution. At present, there is very little recycling in industrial zones, with sorted collections and the reuse and recycling of waste being inadequate. Obsolete and defective waste air purification technology and inappropriate production processes mean that industrial zones emit significant quantities of hazardous substances, including unintentionally produced POPs. Management of the environment currently plays a subordinate role in the development of industrial zones, with businesses in industrial zones working in isolation with collaborative partnerships between companies being almost unknown [12].

Significant barriers that have resulted in environmental problems and poorly developed environmental awareness in the IZ particularly include:

- Lack of knowledge by company managers, local engineering personnel and local technology suppliers about available clean&low-carbon technology, appropriate practices within the operation and process optimisation strategies, such as cleaner production;
- Lack of awareness about alternative financial sources for investments in environmentally-friendly technologies, for instance from the Swiss Green Credit Trust Fund or the Vietnam Environment Protection Fund;
- Lack of public economic incentives and confidence in the recycling economy and company cooperation within the IZ;
- Little enforcement of environmental legislation by personnel bottlenecks and unclear responsibility of the authorities and expertise from the IZ management boards as well as a lack of framework conditions and guidelines for the transformation of IZ into eco-industrial parks.

The barriers mentioned above cannot be overcome unless incremental costs are taken over by GEF.

These include (a) awareness of the availability and use of clean und low-carbon technologies, best environmental practices and process optimisation strategies in IZ and accessing cost-effective financing through alternative finance models (deployment & demonstration), (b) transfer of know-how about the technologies introduced and practices implemented in eco-industrial parks in numerous other IZ through promotion, awareness-raising and training for companies, authorities and investors (diffusion) and (c) the long-term transformation of existing IZ in EIP by improving the skills, processes and legal guidelines of the authorities (transfer & consolidation).

The proposed project activities are designed to be for the long-term: promoting the implementation of industrial production practices in IZ through the specific promotion of company cooperation in the areas of improved energy systems, minimized materials flows and waste management, minimized water flows, effective EIP management and integration into the host community. These activities supplement current projects on industrial pollution management especially the one implemented by MPI [19].

The project focuses on **three pilot IZ in the north, centre and south of Vietnam and selected 45 companies**. The following project components are envisaged:

Component 1: Improvement of policy and guidelines to facilitate the transformation of industrial zones into eco-industrial parks (EIP)

This project component will help government agencies fit existing guidelines to the planning, development and management of IZ and may be used as a basis for promoting innovative resource- and energy-efficient technologies and production practices.

Following project outcomes are expected: (1) Regulation on management and planning of IZ adjusted; (2) Adoption of regulations and guidelines by regulatory authority to enable sustainable operation of industrial zones; (2) Increased access to clean&low-carbon technology funds for IZ companies.

To achieve the project outcomes following project outputs are envisaged:

(1) Review of existing regulations finalized especially on provisions for IZ environmental performance, common services of IZ management and financial incentives of the Vietnam Environment Protection Fund, National Technology Innovation Fund (NATIF) and the Swiss Green Credit Trust Fund; (2) Development of documentation on improvements and extensions of existing regulations encompassing the application of innovative clean&low-carbon technologies and practices, the environmental management and regulatory responsibilities; (3) Disseminate and inform responsible regulatory authority on core elements of EIP transformation.

Incremental/additional activities: existing regulations with regard to environmental management in IZ, IZ management service provisions and finance opportunities are assessed as part of this project component and proposals put forward as to how these regulations may be improved and expanded. The relevant authorities will be informed about the core elements of the eco-industrial park transformation and prepared. No national programme includes these planned activities. The authorities, however, require information regarding how to improve the environmental situation in IZ. This is the reason why a co-finance share was put in place. Other activities beyond information transfer not covered by the co-finance are classified as additional.

Component 2: Capacity building on eco-industrial park strategy and measures

In this project component, the various stakeholders, in particular the IZ companies are informed directly about the required changes in IZ management, technology development and application and the enforcement of environmental legislation within the IZ. The project is, therefore, designed to have a levering effect, with international expertise and trainers from the MONRE and MOIT training centres seeking to actively promote innovative low-carbon and resource efficient technologies and practices.

Following project outcomes are expected: (1) Improved capacity of policy decision makers, IZ management boards, investors, industry associations and IZ companies; (2) New investments into clean&low-carbon technology and industrial practices fostered; (3) Environmental impact of industrial zones significantly lowered.

Following project outputs will be produced: (1) Completed training programs for MONRE, MPI, MOIT, IZ management boards associations and selected IZ companies; (2) Formed closer partnership between IZ management boards and IZ companies; (3) Extended cooperation between IZ companies; (4) Improved enforcement of regulatory mechanisms for IZ management and application of low-carbon and resource efficient technologies and practices.

Incremental/additional activities: training sessions are, for the first time, being used to instruct representatives of MOIT, MONRE and IZ management, followed by IZ companies' representatives. In these, they will be informed of the measures that have to be taken in the eco-industrial park transformation, particularly in the areas of IZ management, technology development and the enforcement of environmental legislation. Previously, these comprehensive training sessions did not include Vietnamese IZ. Training activities relating to the VPEG project in accordance with industrial pollution management are taken into consideration as part of co-financing. The other activities in this project component are defined as additional.

Component 3: Identification and implementation of eco-industrial park pilot projects

This component helps clarify the potential for EIP transformation in three selected IZ in the north, centre and south of Vietnam. The IZ, already preselected by MPI and UNIDO, cover the following area and industrial sectors: North Vietnam: Hung Yen Province, IZ Pho Noi A (metal mechanics, communication technology, ceramics, textile, food processing), Central Vietnam: Danang, IZ Lien Chieu (steel, paper, brewery, galvanizing, furniture, electronics, cement, rubber, tiles), South Vietnam: Can Tho, IZ Tra Noc 1+2 (food & seafood processing, animal feed, brewery, dairy, glass production, packaging, concrete, metal mechanics).

The aim of the project is to provide examples of how innovative technical solutions, such as creating symbiotic

collaboration between IZ companies, may be implemented. The role of the IZ companies in this component is to actively contribute to the clean technology needs assessment and the identification of BAT and BEP.

In addition, the project is not designed to be implemented in isolation as an IZ island, but in collaboration with and in consideration of the needs of the local host community. The following areas, which form the basis of IZ transformation into eco-industrial parks (E.A. Lowe 2005), should be investigated according to each IZ and selected areas be demonstratively implemented.

Improved energy systems
- Maximize energy efficiency through process re-design or rehabilitation, co-generation and energy cascading (energy cascading is using residual heat in liquids or steam from a primary process to provide heating or cooling to a later process, e.g. excess steam from a power plant may be used in a food processing plant).
- Achieve higher efficiency through inter-plant energy flows wherever possible.
- Use renewable sources for energy production extensively and change technology if needed.

Minimized materials flows and waste/by-product management for the IZ
- Introduce cleaner production in a representative number of companies.
- Seek maximum re-use and recycling of materials among IZ businesses.
- Reduce toxic materials risks through materials substitutions and integrated site-level waste treatment.
- Link the IZ businesses to companies in the IZ and in the surrounding region as consumers and generators of usable by-products via resource exchanges and recycling networks.

Minimized water flows
- Design water flows to conserve resources and reduce pollution through closed loops and cascading for uses at different quality levels.

Effective EIP Management
- In addition to standard park service, recruitment, and maintenance functions, IZ management shall be trained to maintain the mix of companies needed to use each others' by-products and to establish a well functioning environmental management system;
- Operate a site-wide information system that supports inter-company communications incl. materials exchange database, inform members of local environmental conditions, and provide feedback on IZ performance.

Improved construction/rehabilitation
- With rehabilitation of existing buildings, follow best environmental practices in materials selection and building technology. These include recycling or reuse of materials where possible and consideration of lifecycle environmental implications of materials and technologies.
- Dangerous existing brownfields of industrial activity are identified and means for monitoring or remediation are developed.

Integration into the Host Community
- Develop projects for the local economy and social systems through training and community business development for better living conditions (child care, planning of housing and recreational facilities).

Following outcomes shall be achieved: (1) Level of EIP optimization potential determined in selected IZ; (2) Needs in neighbouring communities assessed with regard to common projects; (3) Development of strategy for adaptation and deployment of key clean&low-carbon technologies.

The outputs of this component are defined as follows: (1) Three pilot industrial zones definitely selected in the north, centre and south of Vietnam and MPI and IZ management boards committed; (2) Partnerships between public agencies (DONRE, DOIT), management boards and IZ companies formed; (3) At least 10 companies at each IZ assessed in resource efficiency and cleaner production and technology gap determined; (4) Strategic plans at each IZ for inter-company collaboration on reuse and recycling of by-products, waste, energy and water developed and candidate companies selected; (5) Inventory of clean technology needs in IZ completed and best available technologies (BAT) and best environmental practices (BEP) identified; (6) Documentation on the needs assessment of and business resources in neighbouring communities that will be served by a community enhancement program elaborated; (7) Needs of IZ management boards to adapt to new EIP structure/requirements assessed particularly on environmental management, waste exchange data management, logistics, legal compliance monitoring and support completed.

Incremental/additional activities: All activities relating to the selection of IZ, team-building between IZ and the authorities, assessing technology needs in businesses and developing plans for inter-company cooperation in IZ are seen as additional, since no Vietnamese projects are planned. Independently of the GEF project existing planned cleaner production evaluations in businesses are taken into consideration in co-financing. Needs assessment in neighbouring communities and the community enhancement program in association with the development of eco-industrial parks in Vietnam are not part of the baseline project in Vietnam and are, therefore, classified as being completely new and additional.

Component 4: Financing scheme for clean&low-carbon technology application in industrial zones and community enhancement

This section of the project concentrates on the implementation of clean&low-carbon technologies, after these are identified in Component 3. It therefore deals with mobilising financial resources as well as developing eligible investment projects. The finance model is designed, with investment aid, to make it possible to implement timely technology demonstration projects. To this end, both Vietnamese and foreign funds are taken into consideration, including the Green Credit Trust Fund of the Swiss State Secretariat for Economic Affairs (SECO), which includes bank guarantees and direct payments. In addition, the Vietnam Environment Protection Fund (VEPF), the Industrial Investment Program under the auspices of the "Vietnam Clean Production and Energy Efficiency Project" of the World Bank and the Ministry of Industry and Trade (MOIT) will be considered. With regard to technological innovations, the National Technology Innovation Fund (NATIF) is available, which is administered by the Ministry of Science and Technology (MOST). Local bank financing should then follow from institutes with experience in investment banking. These include Techcombank, Vietnam International Bank (VIB) and Asia Commercial Bank (ACB), which are skilled in the proposed projects relating to the transformation of IZ into EIP and are aware of the benefits of financial contributions as well as strategic partnerships with IZ. The role of the IZ companies in this component is to actively demonstrate and deploy process optimization measures and the adoption of clean&low-carbon technologies. IZ companies are, therefore, helped to develop concrete investment projects and access suitable finance.

Following outcomes are expected: (1) Several clean&low-carbon technology investment projects elaborated and implemented through financing from local banks; (2) Several community enhancement projects implemented; (3) Access to alternative technology finance established.

Following outputs will be elaborated: (1) Clean&low-carbon technology investment projects developed and implemented considering low-carbon and best available technology (BAT); (2) Documentation on the financial feasibility of the identified technology projects completed; (3) Financial requirements of clean&low-carbon technology projects reported to banks, alternative finance scheme established and approved by financing institution; (4) Finance scheme for IZ clean technology investment projects widely promoted to banks, IZ companies and governmental institutions. (5) Indicators developed and environmental stress reduction measured (6) Community enhancement projects developed and implemented.

Incremental/additional activities: This project component includes activities that will lead to confirmed investment programmes in IZ companies. Concerted investment plans are developed together with selected companies and finance institutions, including alternative financing bodies, are actively informed above the business opportunities. These processing activities are to be seen as incremental within the context of a rapid implementation of IZ demonstration projects. Since, within investment projects, there are clean & low-carbon technologies, which tend to be more expensive to procure and, therefore, are often not taken into consideration by companies, these additional investment costs are considered as incremental. For this reason, a GEF contribution is seen as part of these investments, alongside co-financing. The activities relating to the implementation of community enhancement are classified as being completely new and additional.

Component 5: Information dissemination on EIP initiative

This component is designed to promote the replication of projects in other IZ and multiplying the reduction of the environmental impacts. It is, therefore, mainly about overcoming the above barriers and creating trust and confidence on the side of investors and users. In particular, it should demonstrate that cooperation between IZ companies will reduce costs through material and energy exchange and the use of innovative technologies as well as enhancing the competitiveness of participating companies. The dissemination of the benefits of eco-industrial parks outwards will attract new investors as well as qualified personnel. These mid-term changes should be documented. In addition, the adaptation of the IZ management boards' service provision portfolio will be highlighted and the new design of the IZ environmental management will be defined and disseminated.

The IZ companies participating in the project will actively demonstrate the results of the process optimizations and implementation of clean&low-carbon technologies. Hence IZ companies are key organizations and will act as opinion leaders towards the wide dissemination of the EIP initiative.

The following outcomes are expected from this: (1) Substantial reduced GHG emission, water pollutants and hazardous waste from the pilot IZ; (2) Numerous replication investments in clean and particularly low-carbon technology in other IZ; (3) Integration of public authority and community in EIP projects consolidated.

Following outputs will be produced: (1) Installed clean and low-carbon technology application demonstration; (2) Monitoring documentation of the environmental, economic and social benefits completed; (3) Communication plan for dissemination of the demonstration results in the three pilot IZ finalized; (4) Documentation on and publication of the completed pilot projects incl. engineering and financing information finalized.

For knowledge sharing and knowledge management with other similar projects 1% of the international waters budget will

be allocated to the "IW Learn" mechanism.

Incremental/additional activities: Currently, within Vietnam, there are no national efforts being made to encourage eco-industrial zones on a broad canvas. For this reason, no initiatives are planned to disseminate knowledge gained from transformed IZ companies. Initiatives are established for promoting and disseminating individual industrial pilot projects (e.g. through MOIT action plan), which are mostly assigned to international finance. Measures for communicating successful environmental projects are partly financed using environmental funds, which are taken into consideration in the co-financing. The other activities of this project component are classified as additional.

Without GEF support, the transformation of existing or newly-planned industrial zones will be much slower. Therefore, the potential for environmental protection would not be exhausted in over 200 IZ with often more than 100 companies from various industrial sectors per zone. The current national planning strategy is primarily based on mid-term economic requirements. Most new investors are recruited by incentivising suitable personnel and lease conditions within IZ. Environmental concerns have been subordinate to these efforts, with the result that no extensive environmental management was introduced into the IZ. Without the proposed projects, cooperation between companies, such as for material and energy exchange, could not be actively supported and only occurred by chance. Existing and new companies in IZ would also manufacture in isolation, with, in terms of the State, predominantly local or national problems, such as the industrial waste water or energy supply. Unfortunately, solution approaches mainly do not consider the preventive improvement of production processes. In the sphere of the disposal of hazardous waste, in addition to planning new landfill sites, innovative approaches to the reduction of waste must be found in the production process. Otherwise there could again be problems with landfill availability and water contamination in the long term. The same also applies to avoiding unintentionally produced POPs. In addition, the planning and successful introduction of waste water treatment plants for IZ urgently requires manufacturers to take preventive measures to reduce the amount of waste water and the persistent toxic pollutants of waste water. Also, the critical discharge of greenhouse gases from industrial zones may only be reduced significantly in the mid-term, if appropriate low-carbon technologies are used. Toxic chemicals can only then be directly replaced and their handling optimised, if the use and the logistics processes are included centrally in the IZ and assessed.

Co-Financing:

Already-planned activities, which are implemented under the existing baseline projects are duly considered. Such initiatives are covered by the co-financing element. These specifically include training activities for the representatives of authorities in association with the implementation of the industrial pollution management (IPM) project, which was started as part of the VPEG programme (**project component 1, co-finance: national government, VEPF**) as well as planned, selective measures for optimising environmental protection in industrial zones (**project component 2, co-finance: national government, VEPF**). The identification of pilot projects using cleaner production evaluations, which are planned using the MOIT action plan, receive further support from other sources (**project component 3, co-finance: bilateral aid of SECO**). In addition, substantial contributions to investments are expected for clean & low-carbon technology applications in industrial zones (**project component 4, co-finance: businesses, banks, Green Credit Trust Fund, NATIF**). Communications relating to successful industrial environmental projects are further financially supported by third parties (**project component 5, co-finance: VEPF**).

The suggested project approach, which includes demonstration projects and the dissemination of information, will have a significant impact on the creation of new IZ and the expansion of existing ones. According to the Vietnamese development plan, 115 new IZ were set up for the period 2006-2015. In addition, 27 IZ were to expand. Project findings will be made available both for the existing and the new Vietnamese IZ. Other countries in the region, which, together can boast a significant number of IZ (Thailand, China and Cambodia), should also be linked in terms of exchanging expertise, thereby guaranteeing a further levering effect and broad, regional application. The project proposed will, therefore, result in the significant **up-scaling of environmental improvements and a sustainability effect**.

The reason for using a multi-focal area project for implementing cleaner production in the broadest sense lies in the multi-faceted nature of environmental problems in companies, which are identified using the cleaner production method and then dealt with using technical and operational measures. Therefore, most are not single focal areas, but several are affected simultaneously (e.g. improved chemical management can have an impact on the international waters and chemicals focal areas). In addition, different focal areas can be complementary. The promotion of innovative energy-efficient technologies, for example, often leads to efficient water usage and/or POPs reduction. When implementing cleaner production, the measures and their effects must be assigned to different focal areas and a multi-focal area project approach adopted.

GEF support for incremental costs and overcoming barriers allow the competitive benefits of EIP to be highlighted, optimum framework conditions created and broad implementation forced in Vietnam. The project will therefore meet the GEF multi-focal area objectives. Unlike current national practice and thinking internationally-relevant improvements are targeted: a reduction in significant amounts of greenhouse gases, increased efficiency in terms of water consumption and the relieving of sensitive large marine ecosystems as well as in (cross-border) rivers, minimised emission of unintentionally produced POPs and optimised management of the chemicals used.

B.3. Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF). As a background information, read Mainstreaming Gender at the GEF.":

The project focuses on three pilot industrial zones in the north, centre and south of Vietnam and selected 45 companies in all three zones for interventions. The project will generate the following socio-economic benefits:

- The use of low-carbon technologies and the implementation of preventive energy efficiency measures in production processes in IZ companies significantly reduce energy requirements. Since the production of thermal and electrical energy is mainly based on fossil energy sources, CO_2, SO_2, NO_x and dust are reduced, which leads to international and local environmental damage.
- The reduction of volumes of waste minimises the need for new landfill areas and opens new market opportunities for the recycling industry.
- The substitution of toxic chemicals and optimised processing will have a positive effect on the health of the workforce and help ensure long-term and stable working conditions.
- The avoidance of unintentionally produced POPs through the consequent implementation of BAT/BEP in selected production processes will help both the local population and the international community.
- Industrial areas often run alongside migration from rural to urban areas. The creation of industrial zones in the last 15 years has shown that 70% of workers in industrial zones are immigrants and 60% of these are women. The project will assess their needs and provide examples of how they can be supported in social matters, including tangible support in the planning of new housing, recreational facilities and the organisation of childcare.
- Improving IZ operations through resource-efficient and cleaner production, companies cooperating in materials and energy and the use of clean und low-carbon technologies will result in a significant improvement in the competitiveness of companies. This means that these companies will appear more successful in both national and international markets, with supplier companies also benefiting. Optimised IZ companies will also be more attractive, a consequence of this being attracting a better-qualified workforce and, in particular, international investors.

In summary the project will support the achievement of global environmental benefits in the following focal areas:

Climate change:

- Direct and indirect avoidance of CO_2 emissions by energy efficiency measures, use of waste heat through company partnering, renewable energies and fuel substitution at company level. The demonstration of low-carbon technologies in IZ and enabling policy environment has potential to be multiplied in 260 industrial zones in Vietnam and more in third countries resulting in significant GHG reduction of global concern.
- The demonstration projects in the three selected industrial zones will result in an estimated GHG avoidance of 150.000 t CO2 per year with further reduction potential of 9.350 kt CO2 per year after dissemination of findings to further industrial zones as mentioned above.
- This results in:
    - Total direct emission reduction of 2,250 ktCO2 for the lifetime of the investment (based on 15 years lifetime of the technology)
    - Total indirect emission reduction of 93,500 ktCO2for an assumed 10 year lifetime project influence

International waters:

- The project concentrates on two transboundary surface water basins, the Mekong and Red river deltas (GEF 5 Objective IW-1) as well as on the Large Marine Ecosystem in Danang region and the South China Sea/Gulf of Tonkin (GEF 5 Objective IW-2). Through the application of new technologies for closed water loops and water cascading in industrial zone industries water use efficiency will be improved and groundwater sources preserved. Moreover through the substitution of raw materials and production process optimization in IZ minimization of transboundary water pollutants will be achieved contributing to reduced land-based pollution of large marine ecosystems (LME) and surface water as well as reduced harm of transboundary fish-species ensuring rebuild of marine fish stocks.

  The Mekong River, which has a globally unique lake-river system and globally significant wetlands and flooded forests, is supporting one of the most productive and diverse freshwater ecosystems in the world. The Red River Basin, one of the largest watersheds in Southeast Asia, originates in Yunnan province, China, and flows through the most densely populated area in Vietnam to the South China Sea where it forms an extensive delta. The South China Sea is the catchment area of the associated upstream river basins. Therefore the health of the South China Sea is significantly impacted by these transboundary river basins and related industrial activities.

  The application of the proposed eco-industrial park initiative resulting in reduced land-based pollution and increased water use efficiency and the dissemination of findings to numerous other IZ in Vietnam and other regional countries will lead to significant stress reduction on international eco-systems in the transboundary river basins (Mekong and Red river, surface and groundwater) and the South China Sea (marine living resources incl. fish stocks). Therefore

both GEF 5 international waters objectives, IW-1 and IW-2, are applied for the proposed initiative.

As mentioned before project findings will be made available both for the existing and the new IZ in Vietnam and other countries in the region and expertise exchanged, thereby guaranteeing replicability of the project.

Chemicals:

- The project aims at reducing the release of un-intentionally produced dioxins and furans of global concern from industrial activities in the industrial zones through the application of BAT and capacity building on BEP. Among the relevant sources for dioxins in the industrial zones will be waste incineration, pulp production, aluminum/copper/zinc recycling, steel recycling, cement production and industrial coal/oil fired boiler systems.

  Selected companies in industrial zones will be supported in achieving sound management of chemicals of global concern as stipulated in the Strategic Approach to International Chemicals Management (SAICM) policy framework. Special emphasis is put on technology transfer and pollution prevention through materials substitution as well as on waste minimization and disposal that have significant adverse effects on human health and the global environment.

B.4 Indicate risks, including climate change risks that might prevent the project objectives from being achieved, and if possible, propose measures that address these risks to be further developed during the project design:

Implementing the project components with several, accompanying measures to break down the afore-mentioned technical, financial, regulatory and knowledge barriers will minimise the risk of converting industrial zones into EIP.

Technical risks:

The mix of industries within industrial zones could limit the exchange of materials and energy. For this form of collaboration, the companies have to run compatible production processes, which could facilitate the use of waste heat or waste from an operation as input for another operation in the required form. If this is not possible, this would slow down project implementation and hamper sustainable success. It would be helpful here to produce a detailed evaluation of company business within an IZ at the entry phase of the project. If companies are incompatible, industrial zones would have to be changed for the demonstration project.

The use of new technologies in the core processes of companies may bring along the danger of company directors shying away from the risk of a production interruption or not wishing to divulge their process knowledge. This risk and the project delays it causes can be avoided by creating confidence in new production technologies, as provided in the accompanying measures.

Financial risks:

The availability of sufficient financial resources for investment in clean und low-carbon technologies could be delayed, caused, for example, by high interest rates of local banks, blocked access to alternative sources of finance or the low creditworthiness of companies. This would also put back project implementation and reduce significant sustainable savings in terms of raw materials and energies. Measures to reduce this risk would include the early integration and information of significant finance partners during feasibility studies of investments projects as well as extensive checking of financial robustness of pilot companies.

Diffusion risks:

The rapid diffusion of the EIP approach in several industrial zones could be delayed due to the authorities' unclear decision-making capabilities as well as the dependent adaptation of existing regulations. For this reason, it is important for state decision-makers to be designated as the national implementing agency from the start and representatives of these legislative ministries (MONRE, MPI, MOIT) to be included in the steering committee.

B.5. Identify key stakeholders involved in the project including the private sector, civil society organizations, local and indigenous communities, and their respective roles, as applicable:

The project requires participation of different GEF implementing agencies according to the mandate and advantage of each organization. The steering committee will be established consisting of representatives from national ministries, industrial associations/corporations as well as national and GEF implementing agencies. The following national ministries and organizations are proposed to be involved in the project management and implementation.

Project management (based on decree No. 29-2008-ND-CP):

- The national implementing agency is the Ministry of Planning and Investment (MPI). Particularly MPI is responsible for the co-ordination with the IZ management boards regarding all investments in infrastructure and technology in IZ, for drafting and adaptation of policies and legal frameworks with regard to IZ planning, for guiding relevant training to management boards as well as for dissemination of project results to other IZ.
- The Ministry of Natural Resources and Environment (MONRE) is a partner in the implementation of the project and a member of the project steering committee. MONRE is also responsible for all issues related to regulations on administration and protection of the environment and works closely with the partners in the project management team.
- The Ministry of Industry and Trade (MOIT) is a member of the project steering committee and a partner for all issues

related to the development of industries in IZ. In specific MOIT is guiding training of stakeholders on eco-industrial park strategy and measures and will supervise the adaptation of existing and selection of new clean and low-carbon technologies.

Project implementation:

- The Vietnam Cleaner Production Center (VNCPC) will be responsible for the assessment of selected companies within the IZ and the elaboration of measures for production process optimization. Moreover the VNCPC will play an important role in providing training to professionals. The VNCPC has been active in this field of services since 1996 and has contributed to numerous cleaner production programmes in Vietnam initiated by national and international organizations. In particular the implementation of energy efficiency projects has played an important role in the sustainability of this center since its foundation. In the meantime the VNCPC has grown to a national centre of excellence recognized by the national and international stakeholders.
- Management boards of the three industrial zones in Danang, Can Tho, Hung Yen: the boards are responsible for the provision of administrative and centralized services relevant to the investment and business operations of investors in industrial zones and therefore an important link between the project management and the IZ companies.

Further organizations to be involved in the technology transfer and information dissemination processes are:

- Vietnam Chamber of Commerce and Industry (VCCI)
- Vietnam Urban environment and industrial zone association (VUREIA)
- Urban Environment Company (URENCO)
- Vietnam National Textile Garment Group (Vinatex)
- Vietnam Steel Association
- Vietnam Cement Corporation (VICEM)
- Vietnam Food Association (Vietfood)
- Vietnam Pulp and Paper Association (VPPA)
- Vietnam Beer, Alcohol and Beverage Association (VBA)
- Vietnam Association of Seafood exporters and Producers (VASEP)
- Selected companies in industrial zones for pilot projects
- Engineering Consultancy Companies
- Other business associations of relevant industry sectors
- International and national suppliers of clean and low-carbon technologies

Finance:

Following institutions and organizations will be involved in project finance:

- Green Credit Trust Fund (GCTF), Swiss State Secretariat for Economic Affairs (Seco)
- Techcombank, Vietnam International Bank (VIB), Asia Commercial Bank (ACB)
- National Technology Innovation Fund (NATIF)
- Vietnam Environment Protection Fund (VEPF)

The project will also involve representatives of the three host communities in Danang, Can Tho and Hung Yen provinces in the development of activities for social benefits like planning of housing, child care or creation of recreational facilities for workers and will be in line with the GEF policy for public involvement in projects.

B.6. Outline the coordination with other related initiatives:

The project management team consisting of MPI, MONRE and MOIT is aware of current initiatives in the area of energy efficiency, water efficiency, waste management, waste water treatment and technology transfer. The responsible national implementing agency MPI will consult with the responsible project implementers during development phase of the EIP project. With this approach **synergies may actively be sought with existing projects involving VNCPC and other partners avoided**. Current relevant programmes are (1) Industrial pollution management in Nhue-Day and Dong Nai rivers watershed implemented by MPI; (2) Action Plan on Response to Climate Change hosted by MOIT; (3) Vietnam Provincial Environmental Governance Project (VPEG) of MONRE, CIDA; (4) Promoting Energy Conservation in Small and Medium Scale Enterprises (PECSME); (5) UNDP/GEF regional project, Barriers removal to the cost-effective development and implementation of energy efficiency standards and labelling (BRESL); (6) National programme on Technology Transfer (TT) on Energy Conservation and Renewable Energy managed by MOST; (7) The Vietnam Clean Production and Energy Efficiency project supported by GEF and WB hosted by MOIT; (8) Technology Needs Assessment for GHG Abatement in the Industry Sector in Vietnam.

The project will particularly consider the initiative under the **„National Environment Protection Strategy"** towards construction of centralized wastewater treatment plants. For designing new waste water treatment plants preventive cleaner production measures for reduction of waste water amount and contaminants will be included. That way investment cost may be reduced and improved waste water quality anticipated.

The project will build on and supplement following previous national Vietnamese/regional GEF projects in the focal areas:

- **Chemicals** (GEF 5 Objective CHEM-1: phase out POPs and reduce POPs releases; GEF 5 Objective CHEM-3: pilot

sound chemicals management):

- UNDP/GEF: Development of National Implementation Plan for Vietnam in the process of Accession, Implementation and Enforcement of the newly-signed Stockholm convention on POPs (2003)

The UNDP/GEF project aimed to help Vietnam fulfill its obligations under the Stockholm Convention by building the country's capacity to manage and monitor POPs and to help Vietnam address its public health and environment issues related to POPs. The objectives of this project were to strengthen capacity of the authorities to manage and monitor POPs, to establish a POPs inventory, to conduct assessments of national infrastructure and capacity and to formulate a national implementation plan. The project was expected to lay the foundation for treatment infrastructure including disposal technologies for POPs waste and cleaner production to reduce the release of POPs into the environment. The proposed eco-industrial park initiative corresponds to the concerns of this project and builds on its preliminary work in particular in the areas cleaner production and technology transfer to minimise POPs release.

– **International waters** (GEF 5 Objective IW-1: balance conflicting water uses in trans-boundary surface and groundwater basins while considering climatic variability and change; GEF 5 Objective IW-2: rebuild marine fisheries, and reduce pollution of coasts and Large Marine Ecosystems (LMEs) while considering climatic variability and change):

The proposed eco-industrial park initiative, which is part-financed through the international waters focal area, includes previous work carried out by GEF and other organisations, carried out in South-East Asia. This work includes strategic lines of attack as well as action plans for protecting transboundary basins/aquifers and marine ecosystems and forms the present finance application. The work includes the following projects:

- Sustainable Development Strategy for the Seas of East Asia (Putraya declaration of regional cooperation for the sustainable development of the Seas of East Asia), GEF/UNDP, PEMSEA, 2003

This development strategy has identified various pollution hotspots in Vietnam, where the existing eco-industrial park initiative will carry out pilot projects. The strategy is based on the significant increase of industrial production in Vietnam and the resultant pollution of the South China Sea, which, together with the effluent and waste from households, represents the largest source of pollution. The development strategy requires the region's countries, including Vietnam, to take actual steps to avoid and reduce environmental effects, which will affect the South China Sea. Environmental action programmes should, therefore, be integrated into national and regional development plans. It is also pointed out that coordinated projects in the form of the proposed eco-industrial park initiative are also important and contribute to the improvement of the environmental situation in large marine ecosystems (LME). (GEF 5 Objective IW-2 relevant).

- An Overview of Public and Private Sector Capacities for Environmental Infrastructure in Five East Asian Countries, GEF/UNDP, PEMSEA, 2005

This assessment has identified, in Vietnam, a significant deficit in drinking water provision and effluent systems. Industrial effluent has, according to the assessment, a significant negative effect on the environment. The content of the effluent and the lack of adequate effluent both in industrial and in residential areas are seen as the greatest problems. Due to the high degree of industrialisation, the surface and ground water was polluted in numerous industrial locations. The authorities, therefore, decided to move industrial operations out of residential areas and concentrate them in industrial zones. It is also noted that, in Vietnam, there is not sufficient capacity for developing environmental and infrastructure projects at local authority level. The proposed eco-industrial park initiative offers solutions to these problems in the areas of water efficiency, minimising toxic effluent content and pre-treating industrial effluent. (GEF 5 Objective IW-1 relevant).

- Mekong Water Resources Assistance Strategy, World Bank, 2006

The study shows that, due to industrial activity in Vietnam and other countries, significant environmental hazards for the Mekong River basin occur that have a negative effect on fishing in the Mekong and resident's livelihood. These problems need to be dealt with through cross-border collaboration. The above strategy proposes establishing environmental protection initiatives within the context of a regional network, doing away with individual, isolated interventions. The proposed eco-industrial park initiative, with its aim of making expertise available to other IZ and regional countries to reduce effluent and its content using pilot project, corresponds to these concerns. (GEF 5 Objective IW-1 relevant).

- Strategic Action Programme for the South China Sea, GEF/UNEP, 2008

The action programme relates to the considerable economic growth and industrialisation of the countries that adjoin the South China Sea, including Vietnam and highlights the consequent destruction of ecosystems in coastal areas. In particular, the wetland ecosystems and marine animals threatened by land-based industrial water pollution are included, some of this being caused by toxic heavy metals. The reduction in and treatment of effluent are in the forefront. This was also taken into consideration in the Vietnamese National Action Plan. One significant target to be found in the action programme is identifying land-based pollution problems and implementing environmental measures both in Vietnam and the region as a whole. The action programme identified two pollution hotspots in Vietnam, in which pilot projects were carried out for the existing eco-industrial park initiative. The aims of the eco-

industrial park initiative clearly meet the requirements of this Strategic Action Programme for the South China Sea. (GEF 5 Objective IW-2 relevant).

- Industrial Wastewater Management in Nhue-Day and Dong Nai river basins of Vietnam, World Bank, 2010

According to the study, the management of the IZ has few personnel capacities and limited knowledge on which to rely when continually implementing the environmental management required in the IZ. Cleaner production is explicitly promoted as a future method regarding water efficiency and effluent minimisation. The study also mentions that, legally, IZ must include centralised waste water treatment plants, the successful operation of which mostly depends on internal effluent pre-treatment measures, due to the wide variety of the toxic effluent content from the different companies. For financial reasons these measures cannot be implemented by numerous companies and, therefore, it is suggested that these businesses be supported through low-interest loans or grants. For such companies, the incentive is even more important, because, in Vietnam, the law is still not fully enforced. The proposed eco-industrial park initiative fully corresponds to the concerns of the study. (GEF 5 Objective IW-1 relevant).

– **Climate change** (GEF 5 Objective CCM-1: demonstration, deployment, and transfer of innovative low-carbon technologies):

- UNIDO/GEF: Promoting Industrial Energy Efficiency through System Optimization and Energy Management Standards (2008)
- WB/GEF: Demand-side Management and Energy Efficiency Program (2003)

C. DESCRIBE THE GEF AGENCY'S COMPARATIVE ADVANTAGE TO IMPLEMENT THIS PROJECT:

UNIDO has comparative advantages in the development and implementation of Industrial Resource efficient and Cleaner Production projects. With its mandate to promote sustainable industrial development, UNIDO has positioned itself as one of the most relevant player to assist industries of both developing countries and economies in transition. UNIDO has long-standing sector-wide experience with technical, policy and financing aspects of efficiency improvement in manufacturing and process industries. UNIDO is internationally recognized as leading advocate and technical assistance provider for resource efficient and cleaner production policies, industrial energy system optimization and energy management systems. UNIDO has supported resource efficient and cleaner production programmes for many years and actively supported the set-up of a Vietnamese cleaner production network. In particular UNIDO started **cleaner production activities already in 1996 in Vietnam** and launched the **Vietnam Cleaner Production Centre (VNCPC)** by the end of the 90's. In the meantime the VNCPC has grown to a national centre of excellence recognized by the national stakeholders and successfully operating in its field of activities.
In addition UNIDO together with UNEP promotes the transition towards sustainable industrial systems in developing and transition countries specifically with the new joint programme on resource efficient and cleaner production (**RECP**) launched in 2009. This programme aims to improve the overall resource efficiency and environmental performance of businesses. RECP builds upon cleaner production in accelerating the application of preventive environmental strategies to processes, products and services to increase efficiency and reduce risks to humans and the environment. During project development UNIDO will support the project team in consulting with relevant projects under the RECP and international energy conservation projects with regard to the transformation of IZ.

C.1 Indicate the co-financing amount the GEF agency is bringing to the project:

UNIDO will provide 1,250,000 USD as co-financing in the form of grant and in-kind contribution. This financing will be allocated to project management support, monitoring and evaluation activities and all other coordination activities necessary to achieve the project objectives. Furthermore a substantial part of co-financing will be contributed by the Green Credit Trust Fund (GCTF) which is linked to UNIDO's Green Industry initiative. The GCTF provides financial support for SME in the private sector I Vietnam and is implemented by UNIDO's partner the Vietnam Cleaner Production Centre.

C.2 How does the project fit into the GEF agency's program (reflected in documents such as UNDAF, CAS, etc.) and staff capacity in the country to follow up project implementation:

UNIDO has started a programme on "**Green Industry for a Low-Carbon Future**" in order to support green industrial growth in the developing world. In 2009 22 Asian countries adopted the "**Manila Declaration on Green Industry in Asia**", expressing their support to implement policies, regulatory and institutional frameworks conducive of making industries more resource-efficient and less carbon intensive, to intensify regional and international cooperation in the adoption of strategies for green growth and the development of cleaner production. In that context UNIDO supports the Vietnamese government in the development of green industry. The proposed project is fully in line with UNIDO's programme and the declaration.

UNIDO pursues a multi-focal approach with present project since the transformation of industrial zones addresses several different internationally relevant environmental aspects in industries at the same time.

UNIDO Vietnam's **Next One Plan 2016** explicitly mentions the expected outcome that key national agencies, in partnership with the private sector and communities, implement and monitor laws, policies and programmes for more

efficient use of natural resources and environmental management. The outputs of the proposed GEF project will significantly contribute to the achievement of this outcome.

Moreover UNIDO started the GEF Medium Sized Project "Promoting Industrial Energy Efficiency through System Optimization and Energy Management Standards in Vietnam" in 2010 and the GEF MSP "Introduction of BAT and BEP methodology to demonstrate reduction or elimination of unintentionally produced POPs releases from the industry in Vietnam" in 2008. UNIDO disposes of sufficient experienced staff in Vietnam to support the proposed project as well.

The project will be closely linked to Vietnam's **Technology Needs Assessment (TNA)** that is being implemented by UNEP on behalf of GEF and enabling Vietnam to identify and implement modern and efficient equipment, techniques, services, capacities and skills necessary both to mitigate and adapt to climate change.

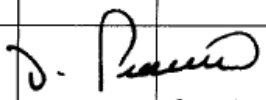
PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter(s) with this template. For SGP, use this OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
Dr. Nguyen Van Tai	GEF Operational Focal Point/Director General	ISPONRE/MONRE	11/30/2011

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF policies and procedures and meets the GEF/LDCF/SCCF criteria for project identification and preparation.

Agency Coordinator, Agency name	Signature	DATE *(MM/dd/yyyy)*	Project Contact Person	Telephone	Email Address
Dmitri Piskounov, GEF Focal Point UNIDO		December 2, 2011	Heinz Leuenberger, Director Environmental Management Branch, UNIDO	+ 43 260 260 # 5611	h.leuenberger@unido.org