



**REQUEST FOR CEO ENDORSEMENT/APPROVAL**  
**PROJECT TYPE: Full-sized Project**  
**THE GEF TRUST FUND**

**Submission Date: April 6, 2010**

**PART I: PROJECT INFORMATION**

**GEFSEC PROJECT ID:**  
**GEF AGENCY PROJECT ID:** P114119  
**COUNTRY(IES):** Philippines  
**PROJECT TITLE:** Chillers Energy Efficiency Project  
**GEF AGENCY(IES):** World Bank  
**OTHER EXECUTING PARTNER(S):** Department of Environment and Natural Resources (DENR), Project Management Contractor  
**GEF FOCAL AREA(S):** Climate change  
**GEF-4 STRATEGIC PROGRAM(S):** CC-SP1 and SP2  
**NAME OF PARENT PROGRAM/UMBRELLA PROJECT:** N/A

Expected Calendar (mm/dd/yy)	
Milestones	Dates
Work Program (for FSPs only)	Nov 2008
Agency Approval date	June 2010
Implementation Start	July 2010
Mid-term Evaluation (if planned)	Jun 2013
Project Closing Date	Jun 2015

**A. PROJECT FRAMEWORK** (Expand table as necessary)

**Project Objective:** The project will provide assistance to stimulate accelerated conversion of CFC-based, and other energy inefficient chillers to new and more energy efficient technology through the provision of financial incentives and a robust policy framework thereby addressing well-documented techno-economic barriers and overcoming market barriers to improved energy efficiency. National capacity for carbon finance intermediation will be built through the project to enable a permanent transformation of the chiller market. The breadth of transformation and the sustainability of project outcomes will be augmented with carbon finance revenues.

Project Component s	Indicate whether Investment, TA, or STA <sup>2</sup>	Expected Outcomes	Expected Outputs	GEF Financing <sup>1</sup>		Co-Financing <sup>1</sup>		Total (\$) c=a+ b
				(\$) a	%	(\$) b	%	
1. Incentive Scheme for Investments in Energy Efficient Chillers	Investment	Transformation of the market for EE chillers • Removal of incentives for emergence of illegal imports and sale of CFCs post 2010	Energy savings through increased use of EE chillers. • 2.1 mt CO <sub>2</sub> equivalent emissions reduced from both (i) EE and (ii) reduction in losses of refrigerant gas; • 250 chillers replaced; • CFC demand for chillers permanently eliminated	2,600,000	6	41,244,810	94	43,844,810
2.	TA	Improvement	Sustainability	0	0	1,821,218	100	1,821,218

Monitoring and Verification		of maintenance practice	y of high efficiency performance of new chillers					
3. Technical Assistance Activities	TA	Increasing awareness of energy conservation opportunities in large buildings and industrial facilities	Chiller owners aware of the life cycle approach to decision making;	0	0	204,000	100	204,000
4. Project management				0	0	1,816,534	100	1,816,534
Contingency						213,836	100	213,836
<b>Total Project Costs</b>				2,600,000		45,300,398		47,900,398

<sup>1</sup> List the \$ by project components. The percentage is the share of GEF and Co-financing respectively of the total amount for the component.

<sup>2</sup> TA = Technical Assistance; STA = Scientific & Technical Analysis.

#### B. SOURCES OF CONFIRMED CO-FINANCING FOR THE PROJECT (expand the table line items as necessary)

<i>Name of Co-financier (source)</i>	<i>Classification</i>	<i>Type</i>	<i>Project</i>	<i>%*</i>
Multilateral Fund (MLF)	Multilateral Agency	Grant	1,000,000	2
Kreditanstalt fuer Wiederaufbau (KfW)	Others	Grant	7,305,629	16
Chiller owners	Private Sector	Counterpart funding	36,619,769	81
Government of the Philippines (GOP)	Government	Counterpart funding	325,000	0.9
US EPA	Bilateral agency	Grant	50,000	0.1
<b>Total Co-financing (plus Contingency \$213,836)</b>			45,300,398	100%

\* Percentage of each co-financier's contribution at CEO endorsement to total co-financing.

#### C. FINANCING PLAN SUMMARY FOR THE PROJECT (\$)

	<i>Project Preparation a</i>	<i>Project b</i>	<i>Total c = a + b</i>	<i>Agency Fee</i>	<i>For comparison: GEF and Co-financing at PIF</i>
GEF financing	0	2,600,000	2,600,000	260,000	2,860,000
Co-financing	5,000	45,300,398	45,305,398	0	45,305,398
<b>Total</b>	5,000	47,900,398	47,905,398	260,000	48,165,398

#### D. GEF RESOURCES REQUESTED BY AGENCY(IES), FOCAL AREA(S) AND COUNTRY(IES)<sup>1</sup>

<i>GEF Agency</i>	<i>Focal Area</i>	<i>Country Name/ Global</i>	<i>(in \$)</i>		
			<i>Project (a)</i>	<i>Agency Fee (b)<sup>2</sup></i>	<i>Total c=a+b</i>
N/A	N/A	N/A	N/A	N/A	N/A
<b>Total GEF Resources</b>					

<sup>1</sup> No need to provide information for this table if it is a single focal area, single country and single GEF Agency project.

<sup>2</sup> Relates to the project and any previous project preparation funding that have been provided and for which no Agency fee has been requested from Trustee.

**E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:**

<i>Component</i>	<i>Estimated person weeks</i>	<i>GEF amount(\$)</i>	<i>Co-financing (\$)</i>	<i>Project total (\$)</i>
Local consultants*	20	0	100,000	100,000
International consultants*	0	0	0	0
<b>Total</b>	20	0	100,000	100,000

\* Details to be provided in Annex C.

**F. PROJECT MANAGEMENT BUDGET/COST**

<i>Cost Items</i>	<i>Total Estimated person weeks/months</i>	<i>GEF amount (\$)</i>	<i>Co-financing (\$)</i>	<i>Project total (\$)</i>
Local consultants*	108	0	1,150,000	1,150,000
International consultants*	0	0	0	0
Office facilities, equipment, vehicles and communications*		0	400,534	400,534
Travel*		0	50,000	50,000
Others**		0	216,000	216,000
<b>Total</b>	108	0	1,816,534	1,816,534

\* Details to be provided in Annex C. \*\* For start-up costs of the project management consultant that will be contracted.

**G. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT? yes  no** 

(If non-grant instruments are used, provide in Annex E an indicative calendar of expected reflows to your agency and to the GEF Trust Fund).

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

Monitoring and evaluation of the Project will be undertaken at two levels: the sub-project level and the project level. At the sub-project level, a system will be established for measuring energy consumption of baseline equipment and of new equipment and for monitoring performance of new chillers using performance parameters such as flow rate of chilled water, inlet and outlet temperatures of chilled water, inlet temperature of condensing water, electricity input, etc. Data loggers and transmitters will be installed for collection of continuous data and an MIS will be developed for storing and processing all data generated by data loggers. Appropriate software will be developed to analyze relevant data and to determine actual energy savings and emission reductions. This software will generate all the technical reports summarizing performance of each individual chillers and performance of the overall program.

At the Project level, the monitoring indicators defined in Annex 3 of the project appraisal document (PAD) are designed to accurately capture the focus of the Project including the number of inefficient chillers replaced by the Project, sustainability of energy savings from new efficient chillers, and continuing and increasing participation of owners of large building and industrial facilities in energy conservation activities. The measuring and monitoring (MM) consultant will be responsible for the measurement and monitoring and will undertake technical inspection including power measurements of baseline and new units, and subsequent inspections, if needed, from time to time until 2019 for the purpose of verifying actual energy savings of new chillers.

The data used for determining the value of indicators will come from the MIS and from annual carbon emission verification reports prepared by the Designated Operational Entities (DOEs). In addition, the data for tracking implementation progress of each project component would also be drawn from progress reports to be prepared by the project manager contractor (PMC).

The PMC will submit to DENR for its periodic assessment, a regular progress report at the following intervals: 1) a monthly basis for the first six months, 2) a quarterly basis for the next twelve months, 3) semi-annually for the rest of the project.

**PART II: PROJECT JUSTIFICATION:** In addition to the following questions, please ensure that the project design incorporates key GEF operational principles, including sustainability of global environmental benefits, institutional continuity and replicability, keeping in mind that these principles will be monitored rigorously in the annual Project Implementation Review and other Review stages.

**A. STATE THE ISSUE, HOW THE PROJECT SEEKS TO ADDRESS IT, AND THE EXPECTED GLOBAL ENVIRONMENTAL BENEFITS TO BE DELIVERED:**

**Inefficiency of Old Chillers.** A chiller is the primary component in a refrigeration or air-conditioning (AC) system. It produces chilled water through heat transfer by circulating a primary refrigerant medium (CFC, HCFC, HFC, NH<sub>3</sub>) in pipe circuits or heat exchangers, using centrifugal pumps and distributing chilled water to remove heat from buildings.

Because use of stockpiled or recycled chlorofluorocarbons (CFCs) in the refrigeration and air-conditioning (RAC) servicing sector is not controlled under the Montreal Protocol on Substances that Deplete the Ozone Layer (MP), they can be used in servicing old CFC-based chillers beyond 2010. However, CFC-based chillers are old technology and are highly energy inefficient. The average chiller manufactured today uses about 35% less electricity than chillers produced just two decades ago. With the best technology available, operated on HCFC-123 or HFC-134a, new chillers can use up to 50% less electricity than the average chiller from 1976.

In addition, due to poor chiller maintenance practice in the Philippines, younger, non-CFC based chillers installed in late 1990s and early 2000s also consume more energy than would be expected. Energy efficiency savings form therefore primarily an environmental consideration and a potential economic incentive for conversion to energy efficient chillers. Replacing CFC-based chillers specifically contributes to reduced greenhouse gas (GHG) emissions both from an energy consumption perspective and from reduced emissions of CFCs which have high global warming potential (GWP).

**Barriers to Replacement of Inefficient Chillers.** Despite the clear benefit to chiller owners of opting for energy efficient chillers through dramatic savings in energy costs, early replacement is not taking place because of financial, technology, and information barriers. In an environment of competing investment opportunities and resource constraints, chiller replacement which requires high upfront capital expenditures is not a priority of building owners. This situation is aggravated by other barriers including weak regulatory capacity, the longer rate of return for investment as compared with other less costly business upgrades, access to capital, and perceived technology risks in operating new non-CFC chillers, and lack of awareness of the potential savings that could be rendered by the new technology. Results from demonstration projects funded by the MP's financial mechanism, the Multilateral Fund (MLF) and the Global Environment Facility (GEF) in Thailand and by the MLF in Mexico and Turkey, as well as a comprehensive MLF-World Bank Chiller Sector Study in India, confirm this finding. Therefore appropriate financial arrangements need to be put in place to accelerate the replacement of inefficient centrifugal chillers to new non-CFC based energy efficient chillers.

The Project therefore aims to tackle the numerous barriers to the adoption of commercially-available energy efficient, non-CFC chiller technology through an offer of an innovative financial incentive that has been determined significant enough to overcome the barriers, particularly the high upfront cost (15%). The level of incentive represents an aggregation of the opportunity costs through the model developed by the chiller study and is intended to catalyze market conversion by replacing not only CFC-based chillers but all inefficient chillers.

The Project will assist a significant number of enterprises in the private and public sectors (representing approximately 375 chillers) to bring about a massive shift in the market to energy efficient, non-CFC chiller technology countrywide. On a macroeconomic level, the Project will showcase to building owners that making investment choices towards selecting energy efficient, environment-friendly technologies for their business solutions make good business sense.

The expected global environmental benefits to be delivered include direct emission reductions of over 700,000 tCO<sub>2</sub> from increased energy efficiency and another 2 million tCO<sub>2</sub> in indirect reductions from avoidance of new power generation; the removal of 108 tonnes of CFC from the replacement of CFC-based chillers; and the elimination of 22 tonnes of virgin CFC demand per annum. 560,000 CERs will be generated for the carbon buyer, KfW for the entire fixed 10-year carbon finance operation

#### **B. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH NATIONAL AND/OR REGIONAL PRIORITIES/PLANS:**

The Project is developed within the context of the Medium-term Philippine Development Plan 2004-2010 (MTPDP) which states that there is a need to manage natural resources and protect the environment to improve the quality of life of Filipinos and endorses systems conversion to ozone depleting substances (ODS)-friendly technology, products and equipment. The MTPDP espouses energy independence and power sector reforms. To achieve higher energy self-sufficiency, the strategy includes among others pursuing energy efficiency and conservation measures such as energy management programs and energy audits to assist industrial and commercial establishments; energy labeling for appliances and equipment; and energy conservation in government offices. A new MTPDP will be prepared starting in 2010, but the strategy for energy is expected to be maintained.

There is also a Philippine Energy Plan (2007-2014) prepared by the Department of Energy (DOE) which is regularly updated and which provides significant inputs to the MTPDP. This project contributes to achievement of the energy sector agenda which is focused on two objectives 1) attaining sustainable, 60% energy self-sufficiency beyond 2010 and 2) promoting a globally competitive energy sector. The first objective specifically aims at strengthening and enhancing the government's energy efficiency and conservation program.

This project will also support the Philippine Government's program on energy efficiency which is embodied in several government laws, policies, plans and programs. Republic Act No. 7638 (1992), the "Department of Energy Act of 1992," the Presidential Administrative Order No. 110 (2004), and the "Institutionalization of a Government Energy Management Program", are four of the major laws and policies that require that conservation, renewal and efficient use of energy keep pace with the country's growth and economic development. A National Food and Energy Council was created which is tasked to assess, formulate, coordinate, monitor and adjust national long-term policies, programs and projects to ensure adequate food and energy needs for the country.

As a Party to both the MP and the Kyoto Protocol (KP), the Philippines is eligible for financial and technical assistance from the MLF, the GEF, and the CDM for projects that help it meet its obligations under these international conventions. The Project is in accordance with objectives of the KP by encouraging energy savings which in turn helps reduce CO<sub>2</sub> emissions. The Project also fits into the objectives of the GEF by transforming the marketplace and introducing the concept of life-cycle based decision-making in the chiller sector. Finally, it is consistent with the objectives of the MP by facilitating the replacement of old, CFC-based chillers and reducing the burden of CFC usage in the servicing sector, while contributing to the reduction of demand for CFC imports. It complements the MLF-financed National CFC Phaseout Plan which addresses all consumption subsectors except that of chillers.

#### **C. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH [GEF STRATEGIES](#) AND STRATEGIC PROGRAMS:**

The Project meets the objective of GEF operational programs on SP #1 and 2 (energy efficiency in commercial buildings and promoting energy efficiency in the industrial sector) in that it will replace older chillers with newer ones that are more energy efficient and utilize refrigerants that have lower GWP and lower or zero ozone depleting potential (ODP); support the development and transformation of the market for energy and facilitate a low-carbon growth path; increase market penetration of energy-efficient chillers in the residential and commercial building markets; support a single market transformation to

accelerate GHG emissions reduction by making use of carbon finance; and, deploy and diffuse energy-efficient chillers in industrial production and manufacturing processes. The additional chillers replaced with financing by CDM resources is equivalent to a replicaton strategy, which is consistent with the goal of ensuring consistency between the efforts of the GEF and CDM, while avoiding duplication of efforts and funding between the two. The Project will also support the Philippines to meet its ODS phaseout obligations under the MP, with minimum disruption to industry and economic development (and also meeting GEF's sound chemicals management objectives).

**D. JUSTIFY THE TYPE OF FINANCING SUPPORT PROVIDED WITH THE GEF RESOURCES.**

This is a GEF-financed project with co-financing from the MLF, carbon finance and chiller owners. This Project proposes to utilize GEF resources as a partial grant to increase market penetration of energy-efficient chillers by removing barriers, improving chiller maintenance practice, and improving the design practice (chiller sizing), in residential, commercial, and industrial establishments. The 15% grant/incentive on the total cost of a new chiller is backed by a study which indicates that this level of grant funding is sufficient to remove perceived barriers to chiller replacement.

**E. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES:**

The Philippines, through DENR, has phased out 2,847 MT of CFCs in accordance with its MP obligations and with financial assistance from the MLF. The MP mandates a complete phase-out of CFC imports in developing countries by January 1, 2010 and countries are requested to develop measures for the effective use of the ODS recovered from the chillers to meet servicing needs in the refrigeration and air-conditioning sectors.

The Project will build upon the experiences and lessons learned from other chiller projects, such as the completed GEF-MLF Thailand Chiller Replacement Project. Of specific interest are the performance indicators, e.g., energy savings, return on investments, etc., that will raise the awareness of chiller owners and promote the concept of chiller replacement. Close coordination with Bank project teams responsible for implementing the India Chiller Energy Efficiency Project and preparing the Philippines project is already occurring and will continue into implementation for the sake of efficiency and cross-fertilization of ideas and experiences.

The Project will also complement other efforts in the Philippines to promote energy efficiency in the private sector such as the IFC-funded Sustainable Energy Finance Program. The US Environmental Protection Agency has programmed a long-term in-kind support beginning the first quarter of 2010 for the development and dissemination of a marketing tool and a recognition program that would outline the advantages of the Project to chiller owners as it did for the India Energy Efficiency Chiller Project. The carbon buyer, KfW, is already involved in carbon finance in the Philippines (with the LandBank) and as such, provides additional insight and experiences for augmenting the impact of the Project. Other private banks and government financial institutions are also involved with the project by providing investment financing to the chiller owners.

The Project is designed as a CDM Program of Activities (PoA) with many CDM project activities (CPAs), i.e. chiller replacements and will facilitate coordination between and build capacity among chiller owners, chiller suppliers, energy service companies (ESCOs), and commercial financing entities in the Philippines to realize market transformation in the chiller sector. This is in line with a GEF working paper that proposed a number of fundamental design principles for market transformation programs, including to target both supply and demand sides; take a holistic view of the market; build flexibility in program design; and consider vehicles for technical assistance and transfer of workable know-how.

**F. DISCUSS THE VALUE-ADDED OF GEF INVOLVEMENT IN THE PROJECT DEMONSTRATED THROUGH INCREMENTAL REASONING :**

Unless suitable financing arrangements are put in place, the internal private incentive for early replacement of CFC-based and other energy inefficient chillers is simply not sufficient. Barriers to early adoption of energy efficient chillers include: (i) high opportunity costs; (ii) perceived technology risks whether energy efficiency performance could be sustained over a long period under the environmental conditions prevailing in the Philippines; (iii) lack of awareness of potential savings that could be

rendered by the new technology; and (iv) competing investment priorities. KfW funding in itself would not be able to overcome these barriers as the carbon revenues only begin to accrue one full year after the project is operational, and only become an important source of revenue three years after project implementation. This Project proposes to utilize GEF resources to address these environmental externalities, supported by the MLF to address the negative environmental externality associated with ozone layer depletion. The carbon finance component in this Project can be seen as a replication strategy of the initial GEF-financed component. GEF support will enable the Philippines to increase market penetration of energy-efficient chillers, improve chiller maintenance practice, and improve the design practice (chiller sizing), in residential, commercial, and industrial establishments. GEF assistance is critical in accelerating the market conversion for EE chillers by addressing and removing barriers through the development, marketing and implementation of an incentive-based chiller replacement program.

**G. INDICATE RISKS, INCLUDING CLIMATE CHANGE RISKS, THAT MIGHT PREVENT THE PROJECT OBJECTIVE(S) FROM BEING ACHIEVED AND OUTLINE RISK MANAGEMENT MEASURES:**

Potential risks and proposed mitigation measures are summarized below.

<i>Risk factors</i>	<i>Description of risk</i>	<i>Rating<sup>a</sup> of risk</i>	<i>Mitigation measures</i>	<i>Rating<sup>a</sup> of residual risk</i>
<b>Operation-specific Risks</b>				
Lack of Interest of chiller owners	Risk of not meeting the targeted number of chiller owners to join the project and/or delays in the chiller owners joining the project due to their inability to put up the 85% financing requirement for the cost of the new chiller.	Moderate	During consultations organized by DENR a large number of chiller owners expressed their strong interest in joining the project. The TA component aims at informing chiller owners of energy savings potential from chiller replacements through on-going discussions and marketing workshops. A financial analysis tool to demonstrate the financial benefits of chiller replacement has been developed to inform chiller owners. The PCEEP intends to utilize MOEF support for attracting the public sector into the project.	Moderate
Performance of new chillers not sustainable.	Performance and energy savings depend not only on the technology but also the quality of the maintenance.	Moderate	The Project encourages chiller owners to acquire maintenance contracts for their new chillers from equipment suppliers or through energy service companies.  On-line monitoring program, through data loggers and transmitters, will provide real-time performance of new chillers. This information will be made available to chiller owners.	Low
Financial management	Weak internal controls and adverse opinion on the DENR's agency financial statements rendered by the external auditors due to errors in or unreconciled account balances.  Lack of FM staff at DENR to focus on the financial management requirements of the project.  Complex and highly technical nature of the project with three funding sources that may create	Substantial	A PMC with a financial management staff experienced in government accounting and reporting will be hired for the project.  Separate bank accounts shall be opened and maintained for each source of funds (GEF, MLF & KfW/CDM).  Separate books of accounts shall be maintained for the project and periodic financial reports shall be required to be submitted both to DENR and the Bank.  An Operations Manual shall be adopted prior to grant becoming effective to describe the detailed policies and procedures under the project and the responsibilities of the PMC, FASPO, FMS	Moderate

<i>Risk factors</i>	<i>Description of risk</i>	<i>Rating<sup>a</sup> of risk</i>	<i>Mitigation measures</i>	<i>Rating<sup>a</sup> of residual risk</i>
	risk of mixing use of funds.		division, etc.  Performance audit shall be performed under the project under terms of reference acceptable to the Bank.	
Procurement	Procurement of MM consultancy and equipment by DENR and procurement of chillers by project participants may have transparency issues or may have delays, which will then impact project sustainability	Moderate	The transparency issue will be dealt with by asking DENR and project beneficiaries to make necessary advertisement in the widely published National Daily News paper for inviting bid and award of Contract - debriefing in the news paper and their web site. DENR will monitor the delay of the beneficiaries and report to the bank for remedial action if any required. Since DENR will follow the Bank's Procurement Guidelines for hiring MM Consultancy and equipment contract, it will be monitored by the Bank through supervision mission and or through a periodical progress report submitted by PMU/DENR. Commercial practice will be considered given that the decision to buy a chiller depends not only on price but also on future maintenance costs.	Moderate

**H. EXPLAIN HOW COST-EFFECTIVENESS IS REFLECTED IN THE PROJECT DESIGN:**

The Project will have a positive impact on the local and global environment by reducing the emissions of GHGs, ODS, and, indirectly by reducing energy demand and other polluting gases such as NO<sub>x</sub>, CO, and SO<sub>x</sub>. Although the economic analysis is limited due to the lack of reliable baseline and quantifiable data on the valuation of human health and impact of climate changes to the livelihood of the Philippine population, it is clear that there are also economic benefits from reducing greenhouse gases and ODS emissions through energy efficiency interventions which substantially exceed the costs associated with implementation of this project.

The project intends to replace 375 chillers (with an average of 330 TR each) in six years from 2010 to 2018 (CDM revenue will continue up through 2019). At a conservative estimate of improving energy by 0.35 kW/TR from the new chillers, the total energy consumption of the chiller owners will be reduced by an average of 341 GWh annually. Thus, 59 MW of future power generating capacity could be avoided – an investment saving of about US\$ 110 million for the country.

The total GHG emission reduction from the Project up through 2019 is about 700,000 tCO<sub>2</sub>, of which 55% would come from chiller replacements funded by the GEF and MLF and 45% financed from CDM revenues (610,000).

The incremental cost effectiveness analysis demonstrates the benefit of replacing chillers under the Project five years earlier than the chiller product life of 20 years. The total GEF and MLF funding that would yield global environmental benefits in the form of GHG reductions is equivalent to US\$ 3.56/t CO<sub>2</sub> abated. On the other hand, the Effective Net Economic Benefit of the Project could reach US\$ 180/t CO<sub>2</sub> abated.

**PART III: INSTITUTIONAL COORDINATION AND SUPPORT**

**A. INSTITUTIONAL ARRANGEMENT:**

The DENR will have the primary responsibility for project implementation on behalf of the Government of the Philippines once the Designated National Authority (DNA), which is housed in DENR, approves the P-CDM project by issuing a Letter of Approval (LoA).



DENR will be acting as the Coordinating Entity (CE) to implement the Project, with different units of DENR having distinct responsibilities as summarized briefly below (please refer to the project document for details):

- a. The DENR Office of the Assistant Secretary for Foreign-assisted projects (FASPO) will, for the Project duration engage and oversee a private consulting firm to act as the PMC; establish, co-chair and maintain a Project Steering Committee having representation from (i) all the Government implementing agencies; (ii) the Department of Energy; (iii) the Project Director; and (iv) members of civil society and the private sector; and maintain separate accounts for the MLF and GEF funds and one account dedicated for the CDM funds. In addition, FASPO enter into procurement contracts with suppliers of goods (except for chiller suppliers) and consultant services contractors and shall adopt a Project Implementation Plan acceptable to the World Bank, giving details of agreed guidelines and procedures for the implementation, supervision, and monitoring and evaluation of the Project.
- b. The GEF Focal Point in DENR FASPO, shall for this Project maintain supervision and coordination of project implementation including financial and procurement management. FASPO will lead the hiring process for the PMC and oversee PMC's day-to-day project management activities. It will also lead on the procurement of goods (chiller data transmitter and the central data management system) and other consultant services under the Project.
- c. The Financial Management Service (FMS) division of the DENR will have overall responsibility for financial management (FM). It shall oversee FM staff of the PMC.
- d. The Environmental Management Bureau (EMB) of DENR which supervises the project's Project Management Unit (PMU), has the operational and administrative responsibility for ensuring good environmental quality in the country. The Environmental Quality Division, which regulates the pollution generated by air emissions, wastewater, chemicals and hazardous wastes, will certify final dismantling and destruction/disposal of the replaced chillers. The Philippine Ozone Desk, which is responsible for the day-to-day operations of the MP program, including promulgation of relevant policies and implementation and monitoring of investment and non-investment activities, will supervise the storage/recycling of the recovered CFCs and HCFCs.

**Project Management Contractor.** DENR will engage a PMC under terms of reference acceptable to the World Bank. The PMC will be headed by a full time Project Director and assisted by full time staff with adequate skills and resources. The PMC will be responsible for the day-to-day operations of the Project. The MLF grant and CDM revenues will be used to finance administrative and management costs. Activities which the PMC will carry out include among others marketing and outreach to target chiller owners to enhance project participation; finalizing a Project Operation Manual for chiller owners; preparing subgrant agreements for individual ownersfor; screening of potential candidates, review of sub-project proposals and supervision of sub-projects; preparing TORs and supervising consultancy services for measurement, monitoring and auditing purposes; preparing technical specifications and supervising goods procurement; assisting KfW in validation and registration of the PoA and the first and subsequent CPAs; assisting DOEs in verification of carbon emission reductions (CERs); and, assisting DENR in implementing the technical assistance component.

A "measurement and monitoring" consultant will be contracted by DENR to carry out Component 2 by implementing a Management Information System for storing and processing all data generated by data loggers and transmitters. The MIS will track energy savings on-line, measure energy consumption of baseline equipment and of new equipment, monitor performance of new chillers by collecting performance parameters and analyzing the data in accordance with the MM&V protocols prepared by the KfW Bank. The MIS will generate all the technical reports for verification for the purpose of CDM payments.

Other possible contractors to the DENR will include suppliers of data loggers and transmitters (to track chiller performance), consultant firms for production of marketing materials, MIS development, performance audits and others if determined necessary during project implementation.

**The KfW** has committed to be the carbon buyer of the project and has assisted in the preparation of the project's PoA Design Document (DD) for submission to the CDM Executive Board.

**B. PROJECT IMPLEMENTATION ARRANGEMENT:**

Three agreements will be signed between the Government and the Bank. Two grant agreements for each the GEF and MLF grants will be signed between the World Bank and the Government of the Philippines. An Emission Reduction Purchase Agreement (ERPA) will be signed between the CE (DENR) and KfW. The carbon credits that will be generated by the CDM-certified chillers will be aggregated and exchanged for proceeds in accordance with the terms and conditions of the ERPA. The CE will also enter into a sub-grant agreement with the chiller owners to ensure their continuous commitment throughout the duration of the project.

The PMC which will act on behalf of DENR, will manage the program of activities under the CDM. This role includes providing guidance on the baseline and operational data collection, management, verification and monitoring requirements as per CDM methodology, collating the CERs from the sub-project implementers who are the chiller owners, and maintaining records of project data.

There will be two modes by which chiller owners can participate in the project: 1) funds from the GEF (and later the CDM) may be used as an incentive for the purchase of new energy efficient chillers at a level of 15% as long as owners agree to surrender future carbon credits earned from new chillers to the project; and, 2) chiller owners may purchase chillers without a financial incentive from the project but will earn a portion of the carbon credits as they achieve energy efficiency requirements during the operation of their CDM-certified chillers.

Part of the GEF and MLF grant funds and the carbon finance proceeds will also be allocated for development of institutional, knowledge, capacity building and logistical aspects of the project, including extensive marketing and outreach, technical assistance and development of the country-level delivery mechanism. The carbon finance proceeds will accrue to a revolving fund that will be maintained to continuously support the replacement of additional chillers including chillers that are not qualified to earn carbon credits due to excessive old age (more than 15 years).

**PART IV: EXPLAIN THE ALIGNMENT OF PROJECT DESIGN WITH THE ORIGINAL PIF:**

The project design is closely aligned with the original PIF particularly in terms of the major project components. However, some changes were made in terms of the carbon financing scheme and carbon benefits to be accrued in relation to the incentive amount. For the former, the planned carbon buyer was changed from the World Bank’s Carbon Finance Unit (CFU) to KfW. After extensive consultation and analysis, the CFU decided that the Project did not offer the returns required in the time period it was looking for. KfW expressed interest in the Project and after some negotiation decided to serve as the carbon buyer. For the latter, the incentive amount was reduced to 15% to accommodate a greater number of chiller replacements in a shorter time period, hence ensuring that carbon revenues begin flowing as soon as possible. This change was necessary given some delay incurred through the change in carbon buyer and determining implementation arrangements. Results of the changes are a higher number of chillers targeted for replacement for a higher amount of CO<sub>2</sub> emission reductions. This in turn has slightly altered the cost-effectiveness value. After a series of consultations with the chiller owners and other stakeholders, the offer of 15% subsidy to encourage the early replacement of chillers was unanimously accepted. This clearly demonstrates the high ownership of the chiller owners to the project and the high importance they place on the in-kind assistance that the other components will provide to address the barriers on technology, information and institution that cannot be addressed by providing only a financial subsidy. With the development of the project, it was also decided not to utilize a commercial bank as the CE, but a private contractor directly under DENR.

**PART V: AGENCY(IES) CERTIFICATION**

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for CEO Endorsement.

Agency		Date	Project		
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Coordinator, Agency name	Signature	<i>(Month, day, year)</i>	Contact Person	Telephone	Email Address
Steve Gorman GEF Agency Coordinator		January 11, 2010	Jiang Ru Acting Regional Coordinator World Bank	202 473 8677	jru@worldbank.org

## ANNEX A: PROJECT RESULTS FRAMEWORK

PDO /GEO	Outcome Indicators	Use of Outcome Information
<p>Reduce GHG emissions by replacing inefficient chillers including both old CFC-based chillers and non-CFC-based chillers.</p>	<ol style="list-style-type: none"> <li>1. 195 inefficient chiller replacements (average of 330 TR) undertaken by 2012 and 375 inefficient chiller replacements (average of 330 TR) by 2019</li> <li>2. Reduction of CFC consumption (target of 22 tonnes ODP)</li> <li>3. Carbon emission reduction: <ul style="list-style-type: none"> <li>• Direct CO<sub>2</sub> Benefits Targeted, including GWP of CFC = 705,498 metric tonnes CO<sub>2</sub>Eq.)</li> <li>• Indirect CO<sub>2</sub> Benefits targeted at up to 2M metric tonnes CO<sub>2e</sub> over 20 years (emissions produced during the production of the fossil fuel and transporting it to the power plant that supplies electricity to the power grid)</li> </ul> </li> <li>4. Energy consumption will be reduced by 341 GWh over 20 years and demand for installed capacity will be reduced by 59 MW</li> </ol>	<p>Yr 1 - Yr 3: Measure effectiveness of project design and implementation arrangement</p> <p>Annually: verification report identifying quantity of emission reductions certified</p> <p>Yr 2: Strategic Assessment of Overall Program Uptake and Financial Position</p> <p>Yr 3: Mid-term review of carbon credit earned and contribution of decreasing demand of CFC in the chiller sector to countries' compliance with the Protocol</p> <p>Yr 6: Forward-looking reassessment and business realignment for other EE products opportunity</p>
	<b>Results Indicators for Each Component</b>	<b>Use of Results Monitoring</b>
<p><b>Component One:</b></p> <p>Investment in Chiller Replacement</p>	<p>Number of new energy efficient chillers installed</p>	<p>YR 1 – YR 3 Determine effectiveness of the financing scheme and implementation modalities of the Project by considering the success rate between the number of proposals and number of successful sub-grant agreements</p> <p>YR 3 Mid-term review to identify needs for any modifications to the project design and financing</p>
<p><b>Component Two:</b></p> <p>Measurement, Monitoring and Verification</p>	<p>A MIS to keep track of data generated from the individual chiller replacement and to generate the reports to support the CER claims.</p>	<p>YR 1 – YR 3 Measure effectiveness of the technical assistance activities undertaken by the Project</p> <p>YR 3 Mid-term review of penetration of replacement market in comparison with overall chiller market in respective countries and identification of needs for further capacity building or market development.</p>
<p><b>Component Three:</b></p>		

Technical Assistance	Increased awareness of chiller replacement  Number of recipients of the Project participating in the recognition program	YR 1 – YR 3 Measure effectiveness of the technical assistance activities undertaken by the Project  YR 3 Mid-term review of penetration of replacement market in comparison with overall chiller market in respective countries and identification of needs for further capacity building or market development.
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**ANNEX B: RESPONSES TO PROJECT REVIEWS** (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF)

<i>STAP comments</i>	<b>Project response</b>
<p><b>1. Technology Intervention and Innovation:</b> The project aims to replace less efficient CFCs-based Chillers by non-CFCs and Energy Efficient Chillers. The innovation is more in the form of financial incentives and policy framework to overcome the techno-economic barriers. The following issues need to be addressed:</p> <ul style="list-style-type: none"> <li>• What is this scientific rationale for providing incentives only to the Chiller owners? Are there no barriers at the manufacturing end? Are there no supply side barriers?</li> <li>• How will the robust policy framework be developed? There are no specific project components and activities aimed at evolving a policy framework and its acceptance and implementation. The project components involve provision of financial incentives directly to the Chiller owners.</li> <li>• What is the extent of the incremental cost of energy efficient Chiller to the Chiller owners compared to the older Chillers and the energy savings?</li> <li>• What is the economic rationale for providing up-front incentive of 20%? Is it based on any analysis of the optimum incentive percentage?</li> <li>• Will the energy efficient chillers spread without the Carbon Revenue from CDM?</li> <li>• What extent of subsidy is required to make the adoption of the energy efficient chillers financially viable based on the energy savings only?</li> <li>• What policy incentive and framework is required to promote energy efficient chillers without financial incentives and is it possible to make energy efficient chillers financially viable at all?</li> </ul>	<ul style="list-style-type: none"> <li>• A policy framework will be developed under Component 3 which will assist in developing and promoting policy measures for good performance in the operation and maintenance of energy efficient, non-CFC chillers.</li> <li>• There are no perceived barriers on the manufacturing or supply side since there are proven practices technology available in the market for energy efficient chillers. The barriers exist on the demand side of the market.</li> <li>• The normative price of a new chiller energy efficient is about US\$ 400/TR in the PH. The energy savings is 30-50% after replacement.</li> <li>• The up-front incentive of 20% has been reduced to 15% to get more chiller replacements in the project. It was based on an investment barrier analysis for the replacement of old chillers to new energy efficient ones.</li> <li>• The barriers that need to be overcome to achieve the widespread replacement of old chillers are formidable. Thus the carbon revenues from CDM will definitely help chiller owner surmount these barriers and accelerate the replacement in the entire sector.</li> <li>• The subsidy offered by the project does not attempt to fully surmount the barriers faced for chiller replacement as it will leverage on several support systems as a part an integrated incentive package such as introduction of a financial analysis tool developed by USEPA to support participants in making decisions with regard to the two incentive options being offered under the project, technical assistance and training on well maintenance of new chillers, measurement, monitoring, and verification of power consumption, energy savings and accounting for emission reductions, and a recognition program.</li> <li>• The policy incentive and framework that the project will assist in developing will provide a comprehensive approach in addressing institutional, technological, market and knowledge barriers that could contribute in enhancing the financial viability of a new chiller replacement.</li> </ul>
<p><b>2. Baseline Scenario and Control Groups:</b> What is the extent of replacement of older Chillers by energy</p>	<p>The project will replace 375 inefficient chillers to energy efficient, non-CFC chillers which will account for at least one-</p>

<p>efficient chillers in the Baseline scenario? How many Chillers are there and what is the installed capacity and what percent of the old Chillers be replaced (270 Chillers accounts for what percent)? It is desirable to have control groups with the older Chillers for monitoring the energy conservation.</p>	<p>fourth of the total chillers estimated to be operating in the country. The older chillers which will not qualify in the program will serve as the control group for monitoring the energy conservation.</p>
<p><b>3. Risks:</b> Are there any risks from the manufacturers' side and how they will be addressed? Will capacity building alone address any supply side risks? Are there any performance related risks? Will 20% financial incentive be adequate to motivate the Chiller owners?</p>	<p>The risks from the manufacturers' side are minimal since the technology to produce new chillers are available and there is enough stimulus for market forces to favor the increase of demand for energy efficient, non-CFC chillers. Performance related risks are minimal and based on the responses from the chiller owners the 15% financial incentive combined with the technical assistance is enough to motivate them to shift to the use of new chillers.</p>

**ANNEX C: CONSULTANTS TO BE HIRED FOR THE PROJECT USING GEF RESOURCES**

Not applicable - GEF funding will be used only for the incentive scheme in the first project component for investing in energy efficient chillers.

**ANNEX D: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS**

Not applicable, as no PPG was requested for this project.

- A. EXPLAIN IF THE PPG OBJECTIVE HAS BEEN ACHIEVED THROUGH THE PPG ACTIVITIES UNDERTAKEN.**
- B. DESCRIBE FINDINGS THAT MIGHT AFFECT THE PROJECT DESIGN OR ANY CONCERNS ON PROJECT IMPLEMENTATION, IF ANY:**
- C. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES AND THEIR IMPLEMENTATION STATUS IN THE TABLE BELOW:**

<i>Project Preparation Activities Approved</i>	<i>Implementation Status</i>	<i>GEF Amount (\$)</i>				<i>Co-financing (\$)</i>
		<i>Amount Approved</i>	<i>Amount Spent To date</i>	<i>Amount Committed</i>	<i>Uncommitted Amount*</i>	
	(Select)					
	(Select)					
	(Select)					
	(Select)					
	(Select)					
	(Select)					
	(Select)					
	(Select)					
<b>Total</b>						

\* Any uncommitted amounts should be returned to the GEF Trust Fund. This is not a physical transfer of money, but achieved through reporting and netting out from disbursement request to Trustee. Please indicate expected date of refund transaction to Trustee.

**ANNEX E: CALENDAR OF EXPECTED REFLOWS**

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

Not applicable.