



GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

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January 20, 2010

Mr. Yannick Glemarec
GEF Executive Coordinator
United Nations Development Programme
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304 East 45th St.
FF Bldg., 10th floor
New York, NY 10017

Dear Mr. Glemarec:

I am pleased to inform you that I am endorsing the project proposal entitled ***China: Promoting Energy Efficient Room Air Conditioners (PEERAC) Project***, for \$6,263,600 in financing from the GEF Trust Fund (GEFTF). I understand that this project proposal will be submitted for approval in accordance with the UNDP procedures. I note that a project preparation grant (PPG) of \$100,000 was previously approved for preparation of this project and that a report on the use of those funds has been submitted to the Secretariat. Taking into account the PPG, the entire GEF grant for the project is \$6,363,600.

I am also endorsing the fee of \$636,360 for project cycle management services.

I am endorsing this project on the understanding that the project will meet the following milestones:

- (i) The GEF Agency approval will be signed no later than February 2010;
- (ii) A report on the status of the project at mid-term will be submitted to the Secretariat no later than May 2013; and
- (iii) The closing date of the project grant will be no later than October 2015 and a terminal evaluation/project completion report will be submitted to the Secretariat within 6 months of such closing date.

You are requested to ensure that the GEF Secretariat is informed when each of these milestones has been met. If any milestone is not or will not be achieved, you are requested to inform me as early as possible. After consultations with your Agency, I may agree to revised milestones or recommend to your Agency the cancellation or suspension of the project, and I will communicate to the beneficiary country and your Agency the basis for such a recommendation.

Mr. Yannick Glemarec

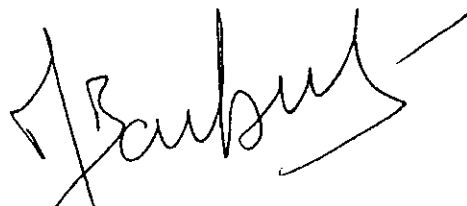
2

January 20, 2010

Please ensure that your grant agreements continue to fully reflect this understanding.

I am attaching a copy of the project tracking sheet and review sheet for your records.

Sincerely

A handwritten signature in black ink, appearing to read 'Barbut', enclosed within a hand-drawn rectangular box.

Monique Barbut
CEO and Chairperson
Global Environment Facility

Attachment: GEF Project Tracking Sheet
GEFSEC Review Sheet

Copy to: Country Operational Focal Point
GEF Agencies
STAP
Trustee

China: Promoting Energy Efficient Room Air Conditioners (PEERAC)

Activity	GEF Contribution (\$ million)	Total cost (\$ million)	Requested Action	Signature	Date
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Program Manager			Recommendation	Zhihong Zhang	9/16/08
Team leader			Clearance	Robert Dixon	9/16/08
CEO			Approval	Monique Barbut	
	\$0.100	\$0.150			
Program Manager			Recommendation	Zhihong Zhang	9/16/08
Team leader			Clearance	Robert Dixon	9/16/08
CEO			Approval	Monique Barbut	
Work Program Inclusion					
Program Manager			Recommendation	Zhihong Zhang	
Team leader			Clearance	Robert Dixon	
CEO			Approval	Monique Barbut	
Council Approval					
Need to circulate to Council for			>second review prior to CEO endorsement (4 weeks review period)		<input type="checkbox"/> Yes
			>CEO endorsement (second review waived)		<input type="checkbox"/> Yes
Program Manager			Recommendation	Zhihong Zhang	
Team leader			Clearance	Robert Dixon	
Endorsement w/o PPG					
Program Manager			Recommendation	Zhihong Zhang	1/20/10
Team leader			Clearance	Robert Dixon	20 Jan 2010
CEO			Approval	Monique Barbut	e-Signed on letter
Final Approval					
Implementing Agency			Approval		
Cummulative GEF Contribution					

SM 9/16

SM 9/16

SM 1/20

United Nations Development Programme

Country: China
PROJECT DOCUMENT



Project Title: Promoting Energy Efficient Room Air Conditioners (PEERAC)

UNDAF Outcome(s): By the end of 2010, more efficient management of natural resources and development of environmentally-friendly behavior to ensure environmental sustainability (with special focus on energy, biodiversity and water resources)

UNDP Strategic Plan Environment and Sustainable Development Primary Outcome: UNDP Strategic Plan Secondary Outcome:

Expected CP Outcome(s):

End-use energy efficiency and application of new and renewable energy technologies improved

Expected CPAP Output (s)

Energy Consumption per unit GDP decreased

Executing Entity/Implementing Partner: Ministry of Environmental Protection

Brief Description

This project contributes to the reduction of greenhouse gas emissions through the transformation of the Chinese air conditioning market towards more energy-efficient room air conditioners used in residential and commercial buildings. It is comprised of activities aimed at improving energy efficiency through the facilitation of the widespread utilization of energy-efficient air conditioning units/systems in the residential and commercial building markets. It focuses on removing a number of key barriers in the room air conditioner industry which affect the manufacture and sale of more energy efficient RAC. The project approach consists of a combination of "technology push" and "market pull" activities. On the "technology push" side, the project will increase the efficiency of room air conditioners manufactured in China by promoting use of new and existing energy efficiency technologies.

Programme Period:	<u>2010-2014</u>	Total resources required	<u>\$ 27,613,600</u>
Atlas Award ID:	<u>00058517</u>	Total allocated resources:	
Project ID:	<u>00072708</u>	• Regular	
PIMS #	<u>4040</u>	• Other:	
Start date:	<u>July 2010</u>	o GEF	<u>\$ 6,263,600</u>
End Date	<u>June 2014</u>	o Government	<u>\$ 350,000</u>
Management Arrangements	<u>NEX</u>	o Other	<u>\$ 21,000,000</u>
PAC Meeting Date	<u>May 2010</u>		

Agreed by (Government):

June 30, 2010 Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

June 30, 2010 Date/Month/Year

Agreed by (UNDP):

June 30 2010

Date/Month/Year

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List of Acronyms

Acronym	Meaning
AC	Air Conditioner
ACC	Air Conditioner Compressor
AMIS	Air-Conditioning Market Information System
APR	Annual Project Review
AWP	Annual Work Plan
BAU	Business-as-Usual
BRESL	Barrier Removal to the Cost-Effective Development and Implementation of Energy Efficiency Standards and Labeling Project
CDR	Combined Delivery Report
CE	Carbon Equivalent
CFC	Chlorofluorocarbon
CNIS	China National Institute of Standardization
CO	UNDP Country Office
CO ₂	Carbon dioxide
COP	Coefficient of Performance (an efficiency measure)
CSC	China Standards Certification Center
CTA	Chief Technical Advisor
EC	Energy Conservation
EE	Energy Efficiency; energy efficient
EER	Energy Efficiency Ratio
EOP	End of Project
FACE	Funding Authorization and Certificate of Expenditures
FSP	Full-size Project
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse gas
GOC	Government of China
HCFC	Hydrochlorofluorocarbon
HPMP	HCFC Phase-out Management Plan
HQ	Headquarters
IA	Implementing Agency
IP	Implementing Partner
IR	Inception Report
ktons	Kilotons = 10 ³ tons
kWh	Kilowatt-hour
LFA	Logical Framework Analysis
M&E	Monitoring and Evaluation
MEP	China Ministry of Environmental Protection
MEPS	Minimum Energy Performance Standards
MIIT	Ministry of Industry and Information Technology
MOFCOM	Ministry of Commerce
MT	Metric tons = 1000 kgs
Mtce	Million tons coal equivalent
Mtons	Million tons = 10 ⁶ tons
NEX	National Execution
NPD	National Project Director
NPM	National Project Manager
NGO	Non-governmental Organization

Acronym	Meaning
NTA	National Technical Advisor
OP	Operational Program
ODS	Ozone Depleting Substance
PAC	Project Advisory Committee
PAT	Project Assurance Team
PR	Public Relation
PIR	Project Implementation Report
PMO	Project Management Office
PPM	Project Planning Matrix
PSA	Public Service Advertisement
RAC	Room Air Conditioner
RC	Refrigerant Compressor
RCU	UNDP/GEF Regional Coordination Unit
SBAA	Standard Basic Assistance Agreement
TA	Technical Assistance
tce	Tons coal equivalent
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN MDG	United Nations Millennium Development Goals

SECTION I: Elaboration of the Narrative

PART I: Situation Analysis

Context and Global Significance

1. In 2007, China consumed 265,480 million tons of coal equivalents (Mtce) of energy and in the process generated 6,300 million tons (Mtons) of energy-use related CO₂ emissions. Its energy needs are supplied mainly from coal, and also from oil and natural gas. From 2000 to 2007, the average annual energy consumption growth rate was 9.8%. Despite the fact that China accounts for 45% of the world's coal supply; 11% of the oil supply; and 5% of the natural gas supply of the world, shortage of energy supply has slowly become more apparent in a country like China, which currently has a booming economy. Since 2004, the electricity demand in the country has been increasing annually by 11%, and it has been apparent that the supply of coal and oil would not be enough to meet the growing demand for energy.
2. In response to the energy issue, and in conjunction with the country's aim to reduce GHG emissions to help mitigate climate change, China currently aim to cut energy consumption per unit GDP by about 20% by 2010 compared with 2005 levels.
3. The total annual energy consumption combined commercial and residential (C&R) sectors in China accounts for about 20% of the country's total energy consumption each year. In the residential sector alone, the electricity consumption increases by 11% to 15% each year. The daily operation of household appliances account for most of the sector's energy consumption. The same can be said about the commercial sector, where bulk of the electricity consumption is also from the operation of building services equipment and appliances.
4. Heating, Ventilation and Air Conditioning (HVAC) accounts for the highest energy consumption among the end uses in the C&R sector at 60 - 65%. About 10% is for air conditioning (i.e., cooling). The increasing demand for air conditioning both in the commercial and residential sectors is manifested in the increasing sales of room air conditioners (RACs), particularly in the residential sector.
5. RAC manufacturing developed at a high growth rate during the 80s and 90s. The local production of RACs reached 75 million in 2007, and this amount accounts for more than 75% of the RAC market worldwide. RAC manufacturing has become mainstay in the Chinese industry sector. Generally, the use of RACs account for the highest energy consumption among all types of household appliances. The current stock of room air conditioners consumes about 5.9% of total national electric power consumption, adding 43.5 GW of peak power consumption to national electricity demand, more than 2.5 times of the 17 GW capacity of the Three Gorges Dam. Considering the total RAC ownership will be doubled in the future 10 years, the utilization of RACs will account for a significant portion of the energy consumption and CO₂ emission generation of the country.
6. In China, the dominant energy efficiency products are classified into Grade 5 (the lowest energy efficiency grade, $2.6 \leq \text{EER} < 2.8$ for cooling capacity lower than 4500W). Based on the investigation carried out by the China Household Electrical Appliances Association (CHEEA) in 2008, about 86% of locally made RAC products are within the Grade 5 category. A vicious circle has formed within the Chinese RAC market: high energy efficiency RACs usually are more expensive, resulting in the consumer buying the cheaper less energy efficient ones. This results in low sales of high energy efficiency RAC units, which subsequently explains why they are more expensive.

7. Considering the market of Chinese-made RACs in the world and the current level of energy efficiency of these products, there is an urgent need to address that vicious circle in the Chinese RAC market through appropriate market mechanism and suitable energy efficiency technology measures, that will help contribute to the:

- Reduction in the GHG emissions from the end-use sectors that utilize RACs;
- Improvement of the average energy efficiency of locally made RACs that are sold domestically and world-wide;
- Increased market share of high energy efficiency RAC products;
- Improvement of the capacity of local RAC manufacturers on the design and production of RACs;
- Improved public awareness on energy efficiency, in general, and the use of EE RACs, in particular.

RAC Manufacturing in China

8. Taking shape in 1978, the RAC manufacturing industry in China was then one of the earliest industries in the country. The beginning of 1990s witnessed a rapid expansion of the RAC manufacturing industry with various types of products produced and production volumes constantly increasing and product quality greatly improved. All of these were primarily attributed to the country's economic growth. The RAC has by far become one of the major appliances typically found in Chinese households due to the rapid economic development in the past ten years.

9. The development of the RAC manufacturing industry in China can be divided into three stages. Phase 1 was from 1996 to 1999, during which the average annual growth rate of RAC production was about 14%. The RAC production in this period increased stably but the growth was considered relatively slow. Phase 2 was from 2000 to 2004, during which the average annual growth rate reached about 41% and the production volume increased rapidly. Presently, the industry is in its 3rd phase (from 2005), and at this stage the average annual growth rate is about 10%.

10. The production of RACs in 2004 was about 60,000,000 units and this went up to 75,000,000 units in 2007, showing an annual growth rate of 15.4%. The local RAC production currently accounts for over 75% of the total production across the world, which makes the RAC manufacturing industry one of the pillar industries in the field of domestic household appliances in China.

11. The RAC export volumes reached 31,986,000 units and the export turnover reached nearly US \$5.57 billion in 2007, ranking China first across the globe in RAC production. The percentage of total production that has been devoted to the export market had been increasing gradually, from 21.5% in 2000 to 52.8% in 2007. With a growing competitive edge, the Chinese-made RAC is gaining larger market share in the global market. The majority of China-made RAC are exported to North America, Asia and the EU.

12. As a core component of a RAC, the local manufacturing of air conditioner compressor (ACC) units has also been on the rise along with the RAC production. The ACC production volume amounted to 85,000,000 in 2007, representing an increased rate of 34.9% compared with the previous year. Moreover, the ACC export volumes have also climbed up annually and reached 14,250,000 units in 2007, up by 42.6% compared with that of 2006. The percentage

of total production that was exported also increased year by year, up from 7.6% in 2003 to 20% in 2007.

RAC Demand & Utilization in China

13. Though regarded as luxury goods in China in the last century, the RAC has become one type of indispensable household appliance in the 21st century, especially in Southern China. The RAC market nowadays is typically found in an urban setting. The average number of RAC units owned per one hundred households has been going up steadily. This value for this indicator rose from 51 in 2002 to 95 in 2007. Despite a comparatively less popular among the northern cities due to climate factor, on the average, there is usually more than one RAC in an apartment unit or a house in most Chinese cities. It can be estimated that the RAC market in cities is nearly saturated based on the above information.
14. In contrast to the high speed of RAC saturation in the urban market, the rural RAC market is left far behind and remains in a period of sluggish growth. However, it can be said that the rural market has huge potential for the RAC products. It is expected that the demand for RAC will rise yearly with the steady increase in incomes of the rural residents. The mean number of units owned in every one hundred rural residences is low at 7.3 units in 2006, but the rural market is expected to expand in the very near future. It is noticeable that rural consumers are more sensitive to price than their counterparts in the urban areas.
15. With the GOC's implementation of policies¹ that promotes the utilization of energy efficient home appliances in the rural areas, the current low saturation level of RACs in the rural areas, it is expected that the rural RAC market will be tracking a high growth trend in the near future. RAC was one of appliances covered in that legislation. It is estimated that the annual growth rate of the domestic sale of RAC units in China will be about 5% during the implementation of the PEERAC project. The total production of RAC in China will exceed 80 million pieces and the domestic sale will be more than 40 million pieces at the end of the project.
16. Without the PEERAC project, it is expected that low energy efficiency RAC will still be produced in China. The proposed project will promote the local manufacture and utilization of energy efficient RACs, by removing the barriers to achieving such objective. The PEERAC project will utilize a "technology push" and "market pull" approach to remove the various identified barriers that hinder the wide scale manufacturing and utilization of EE RACs in China. It is expected that the energy saved in the use of EE RACs will result in the reduction of electricity demand, and consequently a reduction in the amount of fossil fuels used in power generation, and ultimately reduce the generation of GHGs from China's power sector.
17. Table 1 below summarizes the issues/concerns identified concerning the widespread promotion, production and utilization of EE RACs in China during the project development stage, and indicates the project component under which these will be individually and/or collectively addressed.

¹ During the period 2007-2009, the GOC Government of China (GOC) has so far issued three policies related to production and consumption of the energy efficient electric home appliances. These are: (a) "Home appliances going to the countryside"; (b), "Project of energy-saving products for the people"; and, (c) "Replacement of household electrical appliance". Moreover, the Energy Conservation Law that was approved by the National People's Congress in 1997 also aims to promote energy conservation throughout society and also to improve efficiency of energy utilization.

Table 1. List of Barriers and Corresponding Project Outputs that Address Them

Barriers	Project Output
Lack of familiarity with EE technology and market insecurity inhibits EE product development and commercialization	Component 1: AC Compressor Efficiency Upgrades
Compressor manufacturers lack familiarity with energy efficient compressor technology	Output 1.1: Completed and Evaluated In-country Technical Training on High Efficiency AC Compressor Design and Manufacturing
Many product design engineers lack information and exposure to high efficiency technologies and design techniques internationally available	Output 1.2: Completed and Evaluated International Technical Training on High Efficiency AC Compressor Design and Manufacturing
Lack of product planning between compressor and RAC manufacturers to develop energy efficient products	Output 1.3: Completed Manufacturer Dialogue and Product Planning
Compressor manufacturers lack experience with energy efficient compressor design and production	Output 1.4: Completed Technical Assistance on EE Compressor Design and Production
Lack of familiarity with EE technology and market insecurity inhibits EE product commercialization	Output 1.5: Commercialized EE Compressor Products
lack of industry and market information inhibits development of policies and programs promoting RAC EE	Output 1.6: Compilation of ACC Market and Performance Information
Lack of sufficient test data	Output 1.7: Completed EE Compressor Product Testing
Lack of familiarity with EE technology and market insecurity inhibits EE product development and commercialization	Component 2: RAC Efficiency Upgrades
Lack of expertise in evaluation and assessment of energy-efficient air conditioner designs	Output 2.1: International Technical Training on High Efficiency RAC Design and Manufacturing
Lack of in-country design expertise and experience	Output 2.2: In-country technical training on high efficiency RAC design and manufacturing
RAC manufacturers lack hands-on experience with EE product design	Output 2.3: Completed Intensive RAC Design Training
RAC manufacturers lack experience with energy efficient compressor design and production	Output 2.4: Completed Technical Assistance on EE RAC Design and Production
Lack of familiarity with EE technology and market insecurity inhibits EE product commercialization	Output 2.5: Commercialization of EE RAC Products
Low energy efficiency standards relative to other countries discourage commercialization of EE products; lack of training support and promotion reduces impact of existing standards	Output 2.6: RAC Efficiency Standards
Lack of industry and market information inhibits development of policies and programs promoting RAC EE	Output 2.7: Compilation of RAC Market and Performance Information
Lack of sufficient test data	Output 2.8: Completed EE RAC Product Testing
Limited understanding of RAC manufacturers and consumers about the impacts of the use of ODS and high GWP refrigerants in RACs	Output 2.9: Policy Recommendations and Information, Education and Communication Materials on Addressing ODS Refrigerant Replacement and Disposal

Barriers	Project Output
Retailers and consumers lack awareness of EE benefits; EE standards do not encourage EE products; manufacturers unsure of cost effectiveness and market for EE products	Component 3: Energy Efficient RAC Promotion
Institutions and individuals purchases air conditioners lack reference materials explaining benefits of energy efficiency	Output 3.1: High Efficiency RAC Procurement Guide and Procurement Promotion
Retailers lack awareness of energy efficiency and are reluctant to stock EE products; lack of in-store marketing materials for EE products	Output 3.2: Completed RAC Retailer Program
Lack of retailer and sales staff awareness of energy efficiency	<i>Activity 3.2.2: RAC Retailer Training Workshop Design and Implementation</i>
Lack of in-store marketing materials for energy efficient RACs	<i>Activity 3.2.3: Conduct of in-Store Marketing of EE RAC</i>
Dealer reluctance to stock and promote high-efficiency models	<i>Activity 3.2.4: Retail Incentive Program Design and Implementation</i>
Replaced inefficient RACs sold in second hand market or disposed of in un-environmental manner	Output 3.3: RAC Rebate Program Design and Implementation
EE label does not adequately promote EE products; lack of training support and promotion reduces label impact	Output 3.4: Enhanced National EE Label for RACs
Manufacturer uncertainty about cost-effectiveness and market demand for high-efficiency models; consumer preference for low first-cost products; consumer lack of understanding of EE benefits	Output 3.5: Completed Consumer Education Campaign
Consumer preference for low first-cost products	<i>Activity 3.5.2: Development of a Consumer Education Program</i>
Consumer lack of understanding of the lifecycle economic benefits of high-efficiency air conditioners	<i>Activity 3.5.3: Implementation of the Consumer Education Program</i>
Consumers lack information on energy efficient RACs; tools to promote purchase of EE RACs are not readily available	Output 3.6: Web-based Tools
Policy makers and general public lack awareness of benefits of RAC energy efficiency	Output 3.7: Completed EE RAC Public Relations Campaign
Policy makers not aware of and/or do not prioritize RAC energy efficiency	Output 3.8: RAC Energy Efficiency Policy Promotion

18. The identified issues/concerns were discussed, verified and confirmed in a Logical Framework Analysis (LFA) exercise that was conducted by the project development team. The project framework design was developed during that exercise. The project activities to address these issues/concerns were also reviewed and confirmed. The agreed project planning matrix (PPM) is shown in Section II, Part II.

Institutional, Sectoral and Policy Context

19. In line with the ongoing transition to a market economy, the government is developing and experimenting with new tools and mechanisms to improve energy efficiency in the end-use sectors of the country and ensure an appropriate incentives framework. These include deregulation, introduction of joint ventures, energy service companies (ESCO), etc.

20. Nowadays, the Chinese household appliance industry is completely market-oriented. Enterprises have their own independent rights for their investment, development, operations

management, production planning, production organization, marketing, pricing and other decision-making activities. According to the investment sources, the RAC enterprises in the country can be categorized into: (a) State-owned enterprises; (b) Joint venture enterprises; (c) Private enterprises; and, (d) Multinational corporations. The market demand and sales determine the scales of investment and production in the industry. The rapid economic development and increased purchasing capacity of people in China have encouraged expansion of production to meet consumption demand. The growing demand further stimulates investment and production growth. Meanwhile, the market competition among the air-conditioner manufacturers has become more intense.

21. For the management of the RAC industry and of the other consumable manufacturing industries, the GOC mainly uses macro policy to guide their development. For the individual industry, the management implementation is mainly through the industry organizations such as industry associations.
22. Energy efficiency in the electricity end-use sectors features prominently in a number of strategy documents, the 2 most prominent are: (a) China's 11th Five-Year Plan (2006-2010) for Economic Development; and, (b) Energy Conservation Law approved by National People's Congress in 1997 to promote energy conservation throughout society, improve efficiency of energy utilization. Environmental protection is also a priority for the government, and a comprehensive legal and administrative framework has been formulated and implemented. This includes the Environmental Protection Law (1979, amended in 1989), Air Pollution Prevention and Control Law (1987, amended in 1995), China's Agenda 21 Plan, and the recent strengthening of the Ministry of Environmental Protection. More specifically, and related to the production and use of EE RACs, energy efficiency has been identified as a focus in the country plan for energy conservation and is a component of the National Plan of Environmental Protection for China.
23. The proposed PEERAC project will assist China in achieving its goals for sustainable energy production and consumption by decreasing overall electricity demand, as specified in China's Agenda 21 Plan. It will support China's national priorities to conserve energy and protect both the global and local environment, contributing in particular to the National Development and Reform Commission (NDRC) mid-, and, long-term energy conservation plan. Furthermore, the proposed project is in line with 11th Five Year Plan's goal of reducing unit GDP energy intensity by 20% between 2005 and 2010.
24. During the period 2007-2009, the GOC has so far issued three policies related to production and consumption of the energy efficient electric home appliances. These are: (a) "*Home appliances going to the countryside*"; (b) "*Project of energy-saving products for the people*"; and, (c) "*Replacement of household electrical appliance*". These policies deeply reflect GOC's intention of expanding domestic demand for energy efficient appliances and strengthening energy conservation. These policies are not only promoting consumption demand, but also improving energy-efficiency. It will also bring about benefits to pollution control and promote recycling of resources.
25. "*Home Appliances Going to the Countryside*" is for improving the purchasing capacity of farmers. At the end of 2007, the Ministry of Finance and Ministry of Commerce implemented a pilot program in the provinces of Shandong, Sichuan and Henan for the implementation of this policy. The first three products that were targeted are refrigerator, TV set and cell phone. Farmers who buy these products receive direct subsidy of 13% of the product price and the subsidy is from the government. The products that were sold under the pilot program should be reliable, of good quality and reasonably priced. After one year successful operation, the

pilot program coverage was expanded to cover the entire country starting 1 February 2009. For the expanded program, additional consumer products were covered to include: washing machines, motorcycles, computers, water heaters, microwave ovens, induction cookers and air-conditioners. All appliances going to the countryside are required to be of higher energy efficiency. For RACs, these should meet the requirements for at least EE level 3.

26. *"Project of Energy-Saving Products for the People"* is based on State Council's decisions of strengthening the achievement of energy savings. High energy consuming products with significant energy-saving potential were selected for inclusion in the subsidy program. These products should meet the requirements for EE level 1 or 2 (i.e. EE product). When consumers purchase these EE products, they receive certain amount of subsidy from the government. A local group is organized to review the products produced by local appliance manufacturers. . A catalog of energy efficient models produced by the local appliance manufacturers is published. EE RACs are included in this subsidy program.
27. *"Replacement of Household Electrical Appliance"* is a program implemented on 19 May 2009, as per State Council decision, to encourage the replacement of old automobiles and home appliances. The program's aim is to further promote domestic demand for energy efficient products. Based on the current developments and situation in the Chinese household electrical appliance and automobile industries, it is necessary to speed up the replacement of old automobiles and home appliances. The National Development and Reform Commission (NDRC), the Ministry of Finance (MoF) are responsible for this program. In the pilot cities and provinces of Beijing, Shanghai, Tianjin, Jiangsu, Zhejiang, Shandong, Guangdong and Fuzhou, Changsha, 5 categories of TV sets, refrigerators, washing machines, air conditioners and computers are included in this program. Consumers who bring in the old appliance and buy new replacement will receive a discount (subsidy) of 10% of the new appliance price. For the transportation costs of old home appliance to the place or entity where it will be dismantled, a fixed subsidy by the government will be given. The central budget of 2009 will distribute 2 billion RMB for home appliances replacement. To date, the replacement programs in the pilot provinces and cities have already started implementation.

Stakeholders and Related Activities on EE RAC² Manufacturing and Applications in China

28. The proposed project is designed to build on previous, ongoing and planned activities in the country in the area of energy efficiency, in general, and EE RAC manufacturing and EE RAC applications, in particular, as well as on the outputs and lessons learned from the implementation of previous and ongoing EE activities in the country. Table 2 summarizes the previous, current and planned activities of the project stakeholders that are relevant to the PEERAC project.

Table 2: Related Activities on EE RAC Manufacturing and Applications in China

Stakeholder	PEERAC-Related Activities
Ministry of Environmental Protection	Barrier Removal for the Widespread Commercialization of Energy-efficient CFC-Free Refrigerators in China Project; HCFC Phase-out Management Plan (HPMP); Development, enforcement and monitoring of policies and regulations related to environmental protection; Formulation of environment protection-related legislation
National Development and Reform Commission	End-Use Energy Efficiency Project (EUEEP); Barrier Removal to the Cost Effective Development and Implementation of Energy Efficiency

² Henceforth, whenever EE RAC manufacturing is mentioned in this document, it is meant to also include the EE aspects of refrigerant compressor (RC) manufacturing and applications in EE RACs.

Stakeholder	PEERAC-Related Activities
	Standards and Labeling (BRESL) Project; Appliance Recycling Demonstration Program; “Replacement of Household Electrical Appliance” Program; Formulation and implementation of strategies for national economic and social development; Coordination of activities in the government on promoting energy saving and GHG emission reduction.
Ministry of Industry and Information Technology	“Home Appliances Going to the Countryside” Program; “Replacement of Household Electrical Appliance” Program
Ministry of Finance	“Home Appliances Going to the Countryside” Program; “Replacement of Household Electrical Appliance” Program
Ministry of Commerce	“Home Appliances Going to the Countryside” Program; “Automobile and Home Appliance Replacement” Program
China National Institute of Standardization China Standards Certification Center	Barrier Removal to the Cost Effective Development and Implementation of Energy Efficiency Standards and Labeling (BRESL) Project – This is the UNDP implementing partner for the China BRESL National Activities; R&D work on product quality and energy efficiency standards
China Household Electrical Appliances Association	Barrier Removal for the Widespread Commercialization of Energy-efficient CFC-Free Refrigerators in China Project
China Household Electric Appliances Research Institute	Testing, certification, standardization management, calibration and correction, research and engineering, information and media, professional skill training (appraisal) for the household appliance manufacturing industry; Barrier Removal for the Widespread Commercialization of Energy-efficient CFC-Free Refrigerators in China
RAC and ACC Manufacturers ³	Individual planned R&D activities on improving energy performance of ACCs and RACs, individual planned training programs for technical/design personnel, market surveys, testing work, RAC product promotion activities, etc.

29. In particular, the project will draw on the lessons learned from the UNDP-GEF China Refrigerator Project (e.g., “technology push – market pull” concept, provision of technical assistance to manufacturers, importance of recognition, incentives program). The project will also draw on and coordinate with the UNDP-GEF China End Use Energy Project (Energy efficiency policies) and the UNDP-GEF BRESL Project (Capacity building and technical assistance activities on RAC energy efficiency standards and policies)⁴.

³ This includes RAC companies like Chigo (Guangdong); Midea (Guangdong); Hitachi (Shanghai); Haier (Qingdao); Chunlan (Taizhou); Hisense Kelon (Guangdong); Aux (Ningbo); Landa (Zhuhai); Changhong (Sichuan); Gree (Zhuhai); Samsung (Suzhou); and, Galanz (Zhongshan).

⁴ The China BRESL activities focus on 4 of the 6 BRESL appliances, one of which is RAC. The activities, which present opportunities for cooperation with PEERAC since these involve RACs, include the following: (1) Revision of China’s Administration Regulation on Energy-Efficiency Labeling, which, among others, is aimed at improving and enhancing China’s ES&L legal foundations; (2) Training for ES&L Local Enforcement Officials to improve the capacity of relevant agencies and officials to carry out ES&L policies and to realize better ES&L implementation impacts; (3) Development/Revision of EE Standard and Label Implementation Rules for selected electrical appliances among which is RAC with the aim of improving the energy efficiency values specified in related standards, and push for technological advancement toward energy saving; (4) Strengthening of National and Regional Testing and Certification Infrastructure, to standardize laboratory management and improve the testing capabilities, and improve the workings and standards of energy efficiency labs; (5) Progress Evaluation on Implementation Status of China Energy Label, to set-up benchmark data for five products, including RAC, provide technological support based upon data acquired, and improve alignment of support toward implementation of energy standards, labeling, and policies; (6) ES&L Manufacturer Support Program, which among others will advise manufacturers on how to comply with set ES&L standards.

Baseline Scenario

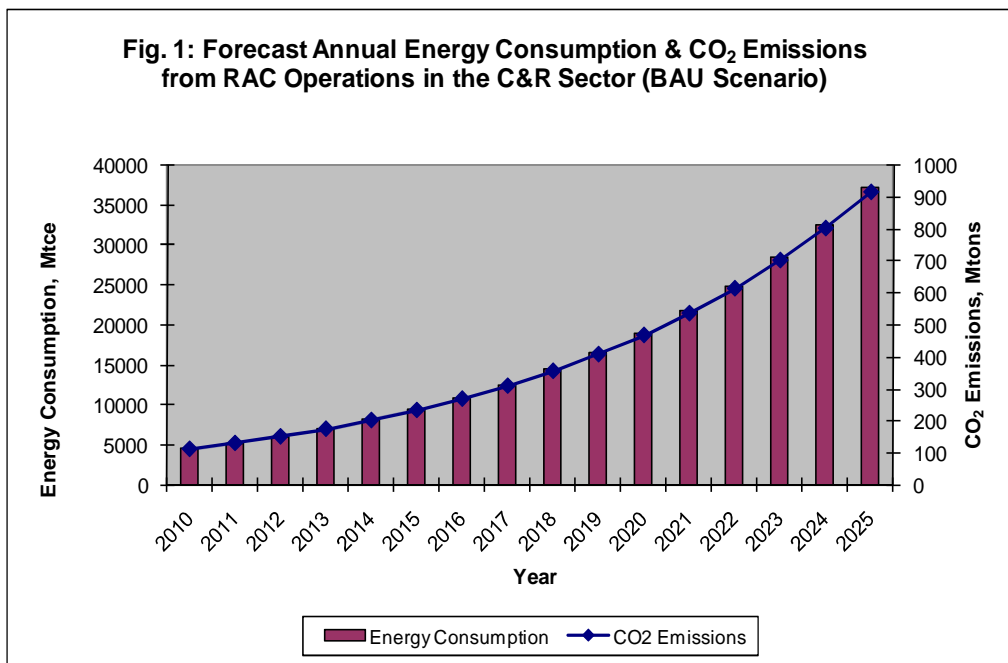
30. As previously mentioned, the average energy efficiency of a RAC unit that is made in China is currently low. That means such RACs consume more electricity to deliver the required cooling compared to a more energy efficient RAC of the same rated capacity. Consequently, the operation of such kind of RAC unit contributes to higher CO₂ emissions in terms of the “more-than-what-is required” amount of fossil fuel-generated electricity. The current average efficiency (in terms of energy efficiency ratio or EER) of locally made RAC units is 2.67, which is very low compared to that produced in Japan. Most of the RACs that are sold domestically are of category Grade 5.
31. While at present there is in general an understanding about the benefits of using appliances that consume less electricity (i.e., energy saving or energy efficient), there are several barriers as to why the widespread manufacturing and sale of EE RACs in country is not realized. The identified barriers are listed in Table 1. The important ones include: (a) Lack of expertise in the cost-effective design and manufacturing of energy-efficient RAC units; (b) Higher-efficiency air conditioning compressors are not available in the domestic market; (c) Lack of awareness and appreciation of the lifecycle economic benefits of high-efficiency RACs; (d) Lack of information for consumers about specific EE RAC models; and, (e) Dealer reluctance to stock and promote high-efficiency models.
32. Although the energy efficiency of RACs sold in the local market has been a concern of the GOC and the local RAC manufacturers, it is anticipated that the manufacture and use of low efficiency RACs will continue in the future if the identified barriers are not removed. The local RAC manufacturers have their own activities related to improving the EE of their products. They are aware of the significance of the energy-efficiency performance of RACs, and are doing their own efforts to improve such performance aspect of their products. However, they do this individually in their own way of achieving such improvement, at their own pace. Whatever they do or plan to do are based on their current knowledge and skills in manufacturing what they consider as “energy efficient” RAC. Because they are after all still competitors in a rapidly growing local RAC market, most of the EE efforts in the industry are fragmented and are expected to remain the same under a business-as-usual scenario.
33. Currently, the technical capacity of the local ACC and RAC manufacturers is also low. In general, they do not know the ‘right’ method to improve EE of their products although the willingness is there. The current planned and budgeted endeavors include: limited R&D work in improving product EER based on the inadequate information that they have; and, training programs on product quality improvements (particularly on safety, improved product design using domestically available raw materials, aesthetics, and controls). For purposes of marketing, the RAC manufacturers are also carrying out their own market surveys, and some of them also have their own corporate activities for marketing their RAC products. However, it should be noted that the current average EE level of locally produced and sold RACs in China is relatively low (EER = 2.67). The current market accepts such low level of EER because most of the consumers are not aware of the energy performance of the RACs sold in the market, are not aware of the importance of the energy performance of the RACs that they buy, and do not know the benefits of purchasing and operating a high EER RAC. Most of the CHEAA member ACC & RAC manufacturing companies are aware of the need and the benefits they can gain for producing EE RACs. Some of them have on their own work in collaboration with appliance testing facilities in the country and abroad in their effort to improve their product energy performance. But without the necessary “technology push” and “market pull”, the current business-as-usual scenario of locally producing and selling what

the market regards as “EE RAC” will persist and the opportunity to realize the energy saving potentials from the electricity savings (and consequently the associated GHG emission reduction) from the use of real EE RACs would not be realized.

34. Based on studies carried out during the project development stage, the baseline, or business-as-usual (BAU), scenario will most likely be characterized by the following:

- Average EER of Locally Manufactured RAC 2.67
- RAC Energy Consumption in C&R Sector (Mtce/yr) in:
 - 2010 4,558.3
 - 2015 9514.5
 - 2020 19,057.2
 - 2025 37,099.1
- RAC Operations CO2 Emissions (Mtons/yr) in
 - 2010 109.9
 - 2015 230.9
 - 2020 465.4
 - 2025 912.0

35. Fig. 1 shows the forecast annual energy consumption and CO2 emission generation from the utilization of RACs in China’s commercial & residential sectors under a business-as-usual (baseline) scenario:



PART II: Project Strategy (Additional Details Contained in Section IV, Part VI)

Project Rationale and Policy Conformity

36. The proposed GEF-supported alternative to the business-as-usual (baseline) scenario is a situation where in the utilization of energy efficient RACs in China’s C&R sector results in the reduction of energy consumption for air conditioning and consequently contribute to the

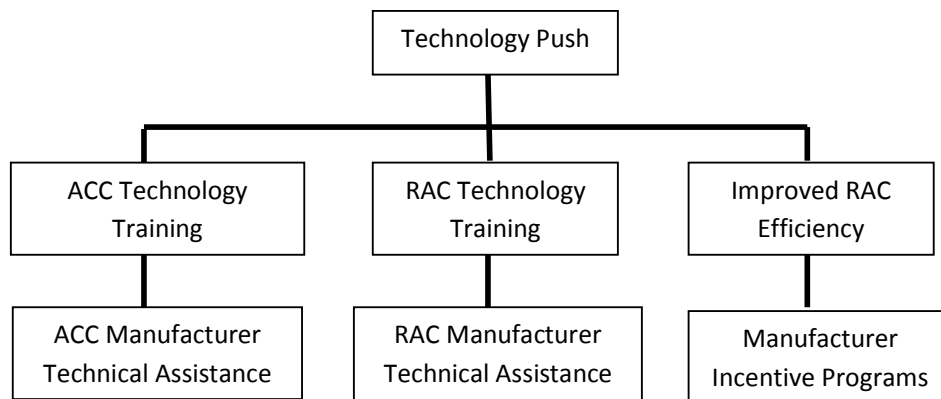
reduction of GHG emissions associated with the fossil fuel-generated electricity supplied by the Chinese power grids. The proposed PEERAC project, which is intended to bring about the alternative scenario, is aimed at achieving a reduction of China’s future GHG emissions through transformation of the Chinese RAC market to the production and sale of EE RACs.

37. The proposed PEERAC project is also intended to contribute to the achievement of the objective set out in the GEF Strategic Program No. 1, which is on Promoting Energy Efficiency in Residential and Commercial Buildings (SP-1).

Overall Project Strategy

38. The project’s overall strategy is to effect a transformation of China’s room air conditioner market through elimination and/or reduction of technical, market, commercial, informational and other barriers to widespread commercialization of energy-efficient models. Project activities are of two general types: “technology push” measures (eliminating barriers to increase the supply of energy efficient air conditioners) and “demand pull” measures (eliminating barriers which reduce demand for energy efficient air conditioners). Details and diagrams further describing this overall project approach are given below.
39. The project will significantly increase room air conditioner energy efficiency in China through a combination of training; technical assistance, incentive, and regulatory measures directed at room air conditioner (RAC) and RAC compressor manufacturers.

Technology Push

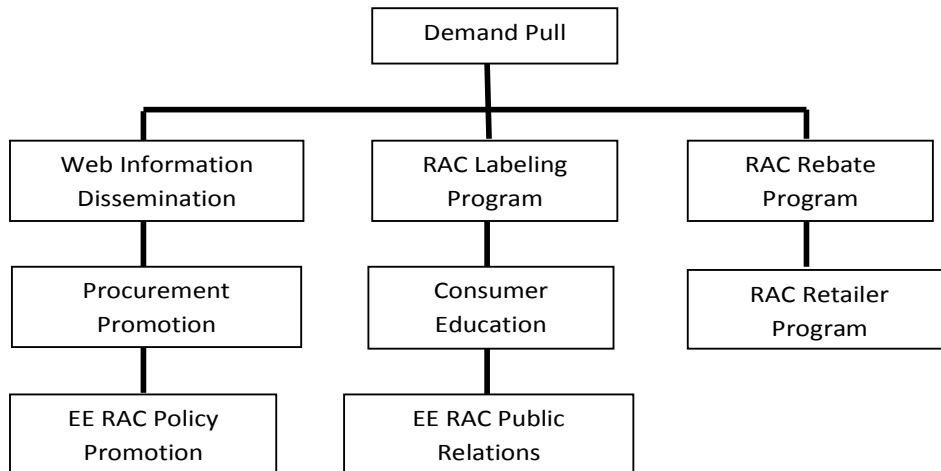


40. Given that energy-efficient compressors are an integral component of an energy-efficient air conditioner, the project includes a range of activities aimed directly at compressor manufacturers. Through international design training, upgrade planning and coordination, technical assistance, and technology transfer, the project will assist compressor manufacturers in improving compressor efficiency levels. A compressor manufacturer incentive program will provide competitively awarded incremental cost funding for development and commercialization of new energy efficient compressors.
41. Similarly, focused training activities for RAC manufacturers will increase their capacity to design and manufacture energy efficient air conditioners. International technology training, energy efficient design training workshops, and intensive energy-efficient design training will provide RAC manufacturers with the tools to create new energy-efficient models. To provide the incentives to design and implement efficiency gains, manufacturers will prepare and

submit competitive bids for incremental cost incentive funding awards. The move to energy-efficient designs will be further sustained by the development and implementation of new minimum energy efficiency standards.

42. Training and technical assistance to manufacturers will also include discussion of refrigerant options and refrigerant choice, and will make ACC and RAC manufacturers aware of the environmental risks and regulatory requirements regarding the use of ODS and high-GWP refrigerants. ACC and RAC manufactures will be encouraged to select non-ODS and Low GWP refrigerants as well as to adopt low carbon emission technology. Market incentives programme will encourage consumers to return the low energy efficient RAC to the accredited recycle centers. The recycle center will be assisted to collect data of refrigerant recycling/destruction in the low energy efficient RAC.
43. Demand-pull activities include a number of programs designed to reduce barriers to consumer knowledge of and demand for energy-efficient air conditioners. While consumers have in general become more conscious of energy efficiency as a result of GEF and other energy efficiency projects, demand for energy efficient air conditioners has lagged due to lack of efforts to address market barriers in a coordinated fashion. This project intends to remedy that lack of effort.

Demand Pull



44. To generate demand and increase consumers’ understanding of the benefits of high-efficiency air conditioners, a Consumer Education Program will be designed and implemented in conjunction with RAC manufacturers. Consumers will also be targeted with educational and informational materials at the point of sale in order to reduce informational barriers to purchase and increase consumer confidence in the quality of information available. Simultaneously, a Public Relations Program will be undertaken to more deeply and educate the public in a sustainable manner on the benefits of energy efficiency and energy efficient air conditioners. In addition, the nationally energy label will upgraded to provide consumers with more complete information regarding energy efficiency and better promote purchase of efficient products. Retail staff will be trained in the understanding and promotion of energy efficiency. A retail incentive program will further encourage sales of energy efficient air conditioners at the retail level. An enhanced labeling program will provide RAC purchasers with more information on RAC energy use. A procurement promotion program will encourage organizations to purchase energy efficient RACs. A policy promotion program will

conduct formal and informal meetings with policy makers to increase their awareness of energy efficiency and project priorities.

45. Many individual consumers in China are now purchasing their second generation of air conditioners, with the old air conditioner often sold second-hand or disposed of in an environmentally unsound manner, thus reducing potential energy savings or resulting in other local and global environmental problems. A rebate/buyback program will address this problem by providing financial incentives to consumers to return old air conditioners and purchase a new energy-efficient model. RAC manufacturers will have the incentive to take back those old RACs and recycle them in an environmentally sound manner.

Alternative Scenario

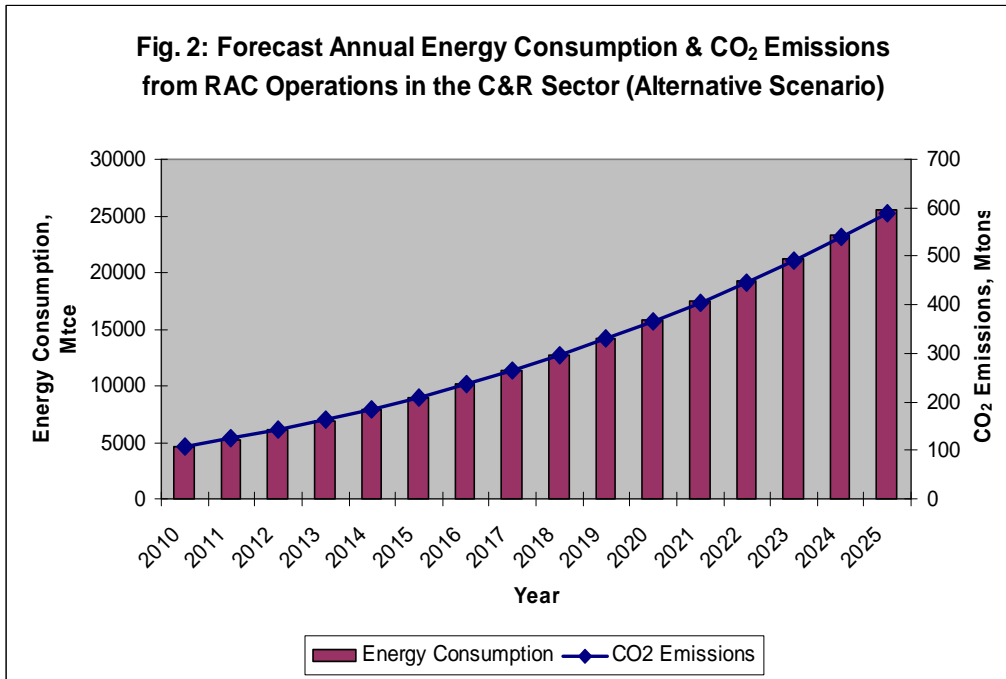
46. Under the alternative scenario, the new RACs that will be installed in China’s C&R sector will be of the energy efficient variety. The domestic RAC and ACC manufacturers are expected to participate in the efforts to produce energy efficient RACs. With the capacity building, technical assistance, and incentives that they will receive from participating in the PEERAC project, they would have understood the benefits of energy efficiency to their businesses, not to mention to the country, they are expected to make use of the opportunity to improve the energy efficiency of their manufactured products. Moreover, the public awareness on the energy and energy cost savings that can be derived from the use of energy efficient electrical appliances such as RACs will improve the consumers’ willingness to pay for such kind of appliances.

47. In the Alternative scenario, it is expected that the average energy efficiency for all RACs manufactured and sold in China will increase by at least 10% by the end of the PEERAC project. This is equivalent to raising the EER from 2.67 to 2.94), with a reach goal of 20% average energy efficiency gain (equivalent to raising the current EER from about 2.67 to 3.20). It is also expected under the alternative scenario that the market share of energy efficient (Grades 1 and 2) RACs will be at least 215% by end of project.

48. The realization of the Alternative Scenario is manifested by and large by the following:

• % improvement in the energy efficiency of RACs by end of project	10
• Average EER of RACs by end of project, W/kWh	2.94
• % market share of EE RACs by end of project:	15
• RAC Energy Consumption in C&R Sector (Mtce/yr) in:	
➤ 2010	4,557.2
➤ 2015	8,935.3
➤ 2020	15,746.8
➤ 2025	25,568.2
• Cumulative Energy Savings (Mtce) by end of project	939.5
• RAC Operations CO2 Emissions (Mtons/yr) in	
➤ 2010	108.3
➤ 2015	209.7
➤ 2020	365.8
➤ 2025	589.1
• Cumulative CO2 Emission Reductions (Mtons) by end of project	35.4

49. Fig. 1 shows the forecast annual energy consumption and CO2 emission generation from the utilization of RACs in China’s commercial & residential sectors under a business-as-usual (baseline) scenario:

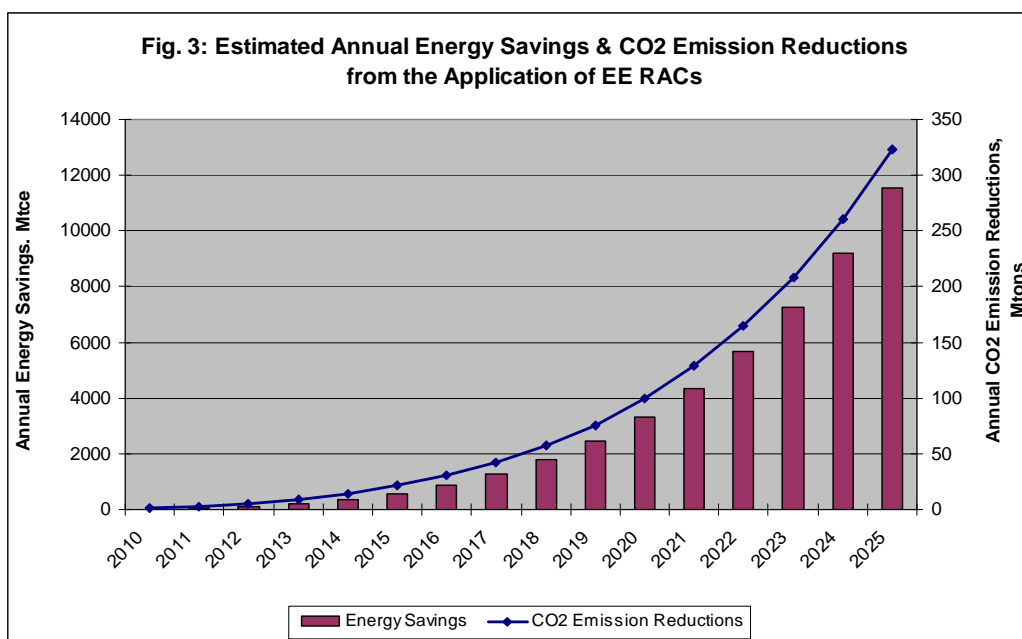


50. Table 2 below summarizes the characteristics of the Baseline and Alternative Scenarios and the net project impact in terms of energy savings (Mtce/year) and CO₂ reductions (Mtons CO₂ per year, and cumulative). The summaries of estimated energy savings and CO₂ emissions reductions from the widespread application of EE RAC manufacturing and EE RAC applications is in Section IV, Part III of this Project Document.

Table 2. Summary of Expected Results of Baseline and Alternative Scenarios

Indicator	Project Start	Project End	5 Years after EOP	10 Years after EOP
Business-as-Usual (BAU) Energy Consumption (Mtce/yr)	4,558.3	9514.5	19,057.2	37,099.1
Alternative Scenario Energy Consumption (Mtce/yr)	4,557.2	8,935.3	15,746.8	25,568.2
Energy Savings (Mtce/yr)	1.2	579.2	3,310.4	11,530.9
Energy Savings compared to BAU (%)	0.03	6.1	17.4	31.1
Energy Efficiency Ratio	2.67	2.94	3.41	3.81
Business-as-Usual (BAU) CO ₂ Emissions (Mtons/yr)	109.9	230.9	465.4	912.0
Alternative Scenario CO ₂ Emissions (Mtons/yr)	108.3	209.7	365.8	589.1
CO ₂ Reductions (Mtons/yr)	1.6	21.1	99.6	322.9
CO ₂ Emission Reductions compared to BAU (%)	1.5	9.2	21.4	35.4
Cumulative CO ₂ Emission Reductions (Mtons)	1.6	35.4	175.6	583.2

51. The difference in the magnitudes of annual energy consumption and CO2 emissions in the baseline (BAU) and alternative scenarios represents the potential energy savings and CO2 emission reductions. Fig. 3 shows the forecast annual energy savings and CO2 emission reductions in the utilization of RACs in China’s commercial & residential sectors.



Project Goal, Objective, Outcomes and Outputs/Activities

52. This proposed project has for its goal the reduction of GHG emissions from the Chinese commercial and residential sectors. The project objective is the reduction of China’s future GHG emissions through transformation of the Chinese room air conditioner (RAC) market to production and sale of more energy-efficient RACs. It is expected to contribute to the reduction of GHG emissions through the transformation of the Chinese RAC market and C&R building market towards more energy-efficient building equipment/appliances, technologies and practices.

53. Specifically, the proposed project will reduce carbon emissions by an estimated 54.6 Mtons (cumulative) by end of the project. This represents a 3.4% reduction of the forecast total CO2 emissions in China’s C&R sector in 2009, or 16.8% of the projected cumulative CO2 emission reductions in China’s C&R sector by end of project.

Table 3. Project CO2 Emissions Reductions

Estimated Total CO2 emissions in China’s C&R sectors in 2009	1,613.3 Mtons
Cumulative CO2 emission reduction potential from the widespread use of EE RACs and energy conserving operation of RAC systems in the C&R sectors in China by end of project (EOP)	35.4 Mtons
% of total CO2 emissions in China’s C&R sector in 2009	2.2%
% of cumulative CO2 emissions in China’s C&R sector by EOP	0.3%
% of cumulative CO2 emission reductions in China’s C&R sector by EOP	4.7%

54. The goal of the project is the reduction of GHG emissions from room air conditioning in China's residential and commercial sectors. Its objective is the significant improvement of the energy efficiency of locally manufactured room air conditioners in China.
55. The proposed project is comprised of three (3) substantive components, consisting of:
- Component 1: AC Compressor Efficiency Upgrades
 - Component 2: RAC Efficiency Upgrades; and,
 - Component 3: Energy Efficient RAC Promotion
56. The expected outcomes from each of these components are as follows:
- Outcome 1: More locally produced high efficiency AC compressors
 - Outcome 2: More locally produced high efficiency room air conditioners
 - Outcome 3: Enhanced enabling environment to support energy efficiency and Increased market share of EE RACs
57. The project will adopt a multi-faceted approach to ensure the sustainability of technology efficiency upgrades, regardless of whether such upgrades are obtained via internal development, development in conjunction with national design bodies, or development in conjunction with international technology partners (e.g., licensing). Complementary and coordinated activities under these project components to contribute to the realization of these outcomes have been designed to remove barriers as necessary. The following paragraphs describe the outputs and activities under each project component.

COMPONENT 1: AC COMPRESSOR EFFICIENCY UPGRADES

58. This project component is designed to address air conditioner compressor (ACC) manufacturers' lack of familiarity with energy efficient (EE) technology, as well as their "chicken-and-egg" dynamic that keeps them from developing and commercializing more efficient products given the lack of demand for such products from room air conditioner (RAC) manufacturers. The expected outcome from the interventions that will be carried out under this component is that there will be more energy efficient AC compressors manufactured and sold in China. In the absence of activities implemented under this project component, manufacturers would not implement significant EE activities, and no significant compressor EE gains would be achieved. The realization of the expected outcome will be indicated by increased market share, production levels, and average efficiency levels for EE ACCs.
59. Participating ACC manufacturers will be supported and incentivized to develop higher efficiency designs, but will not be required to do so by use of a single prescribed approach. It is expected that different manufacturers will adopt different techniques. For example, manufacturers with existing international partners may be more likely to transfer higher efficiency designs, while manufacturers with greater domestic design capability would be more likely to develop improved models in-house. The purpose of the targeted training and technical assistance activities under Component 1 is to give all participating manufacturers the capacity to improve product designs, with increased levels of expertise at each of the participating manufacturers. The incentive program (see further discussion below) will then provide them with a strong incentive and incremental cost funding to implement those improvements. Further incentives will be provided by higher efficiency standards for RACs and consumer education, which will in turn increase demand for high efficiency

compressors. The combination of these approaches will provide for a sustainable increase in efficiency levels.

Output 1.1: Completed and Evaluated In-country Technical Training on High Efficiency AC Compressor Design and Manufacturing

60. Technical training will be provided to ACC manufacturer design and technical personnel will on the design and manufacturing of EE ACCs. The training program will be designed in such a way to maximize training effectiveness and attractiveness to participating manufacturer trainees through a combination of various training approaches, drawing on the successful experience of the China CFC-free Refrigerators Project. Senior international and national ACC experts who are knowledgeable and experienced in EE ACC design and production will be engaged for the training program. Participating manufacturers will be encouraged to adopt team-based design approaches in order to minimize employee retention risks. Multiple individuals will receive training from 6 manufacturers. In the absence of GEF support, no such training would be completed, and the ACC manufacturers' lack of familiarity with energy efficient ACC technology would not be addressed. Success in delivering this output will be measured by the number of training activities successfully completed; trainee satisfaction levels of the training activities; percentage of trainees gainfully employed in high efficiency ACC design/production; and trainee employment retention levels.

Activity 1.1.1: Capacity Needs Assessment of Local ACC Manufacturers

61. A survey will be conducted to determine and evaluate the current level of capacity of the local ACC manufacturing industry to design and manufacture energy efficient ACCs. The results of the assessment will be used in designing a training program for improving the knowledge and skills of the industry in the manufacture of EE ACCs, as well as in the provision of technical assistance (Activities 1.4.1-1.4.3).

62. **Activity 1.1.2: AC Compressor Technology Training Workshop Design and Implementation** - This activity will involve the design, preparation, organization of 2 in-country compressor technology training workshops that will take place in Year 1. It will be on EE ACC design and product commercialization. The training materials will be prepared by experts that will be engaged, and will be based on the results of the assessment carried out in Activity 1.1.1. For the first training workshops, compressor manufacturer trainees (estimated 12 trainees from 6 participating manufacturers) will receive training in China in energy efficient ACC design and product commercialization. For the second training workshop, the approach (if necessary), will be modified based on the findings/recommendations of the evaluation of the first training workshop. It is estimated that the same number of trainees (12) from another 6 participating manufacturers be participating.

Activity 1.1.3: Evaluation of In-Country AC Compressor Technical Training

63. This activity involves the assessment of the effectiveness of the in-country training courses that will be conducted and to come up with relevant recommendations for future continuing training program on EE ACC design and manufacturing (product commercialization) after the PEERAC project. After each training workshop, the trainees will evaluate the quality of the training provided. Also, the training experts will evaluate trainee preparation for the training, and knowledge/skills uptake. The evaluations are expected to provide useful feedback in the design of similar training programs in the future. As part of the impact analysis of this activity, post training surveys will be carried out to determine how the

recipients of the training are utilizing the knowledge and skills that they learned in their respective work in the ACC/RAC manufacturing industry or ACC/RAC service market.

GEF support is required for the necessary technical assistance in the design, implementation and evaluation of the training programs.

Output 1.2: Completed and Evaluated International Technical Training on High Efficiency AC Compressor Design and Manufacturing

64. Many AC compressor design engineers lack information and exposure to internationally available high efficiency technologies and design techniques. An international training workshop and study tours to international compressor design facilities will be organized for a projected 8 AC compressor manufacturer trainees. Trainees will receive technical training and exposure to advanced compressor technologies and in the design and manufacture of energy efficient AC compressors. The activity will take place during the first year of the project. Success in delivering this output will be measured by the number of training activities successfully completed; trainee satisfaction levels of the training activities; percentage of trainees gainfully employed in high efficiency ACC design/production; and trainee employment retention levels.

Activity 1.2.1: International AC Compressor Technology Training Course Design and Implementation

65. This activity will involve the design, preparation, organization of an international compressor technology training course that will take place in Year 1. It will be on advanced compressor design and application technologies. The training course will also involve visits to international compressor design facilities. With the advice of experts, the PMO will identify and select international training institutes that can design the appropriate training course for the local EE ACC manufacturers based on the results of the capacity needs assessment in Activity 1.1.1. Foreign EE ACC manufacturers that can host the trainees for the demonstration of advanced EE ACC design and production techniques will also be identified. Arrangements for the visits to these manufacturing facilities will be made. About 10 ACC manufacturer trainees will take part in the training course.

Activity 1.2.2: Evaluation of International AC Compressor Technical Training

66. This activity involves the assessment of the effectiveness of the international training course that will be conducted. It will be conducted in conjunction with Activity 1.1.3, and will also come up with relevant recommendations for future continuing training program on EE ACC design and manufacturing (product commercialization) after the PEERAC project. After the foreign training course, the trainees will evaluate the quality of the training provided. The training experts will evaluate trainee preparation for the training, and knowledge/skills uptake. The evaluation is expected to provide useful feedback in the design of similar training programs in the future. In conjunction with Activity 1.1.3, the impact analysis of this activity will be assessed through post training surveys that will be carried out to determine how the recipients of the training are utilizing the knowledge and skills that they learned in their respective work in the ACC/RAC manufacturing industry or ACC/RAC service market.

GEF support is required for the technical assistance in the design and evaluation of the training course, including the cost for the implementation international training course and training expenses

Output 1.3: Completed Manufacturer Dialogue and Product Planning

67. Lack of coordination and product planning between compressor and RAC manufacturers acts as a barrier to development of new energy efficient products, since compressor manufacturers produce compressors based on manufacturer orders, while RAC manufacturers design air conditioners based on existing, less efficient compressor models. Where newer compressor models are incorporated, there is a significant lag between their development and incorporation into new RAC models. The project will address this barrier by organizing (and requiring participation in) a forward-looking planning dialogue between compressor and RAC manufacturers in order to focus compressor and RAC designs on the more efficient products which the project will enable and support. Based on the workshop and other follow-up coordination activities between manufacturers, new high-efficiency compressors will be incorporated into new RAC designs to a greater extent than would otherwise be the case and with significantly reduced lag.
68. The success in delivering this output will be indicated by the number of coordination activities that will take place; the number and share of manufacturers participating in coordination activities; and the number of RAC high efficiency prototypes using new high efficiency compressors.

Activity 1.3.1: Organization and Conduct of an ACC Manufacturer Dialogue and Product Planning Workshop

69. This activity, which will take place in Year 3 of the project, involves the organization of a forward-looking planning dialogue between AC compressor and RAC manufacturers in order to focus AC compressor and RAC designs on the more efficient products which the project will enable and support. As a result of the workshop and other follow-up coordination activities between manufacturers, new high-efficiency AC compressors are expected to be incorporated into new RAC designs to a greater extent than would otherwise be the case and with significantly reduced lag.

Activity 1.3.2: Coordination and Evaluation of Follow-up Manufacturer Dialogue

70. This activity is intended to track the progress in the partnership/cooperation between ACC and RAC manufacturers towards the manufacture of EE RACs using locally made EE ACCs. The PEERAC Team will coordinate the holding of, and participate in, the follow-up meetings. The manufacturers' dialogue series will be evaluated as to their benefits and merits to the ACC and RAC manufacturing industries.

GEF support is required for the technical assistance in the manufacturer dialogue discussions and EE product planning.

Output 1.4: Completed Technical Assistance on EE Compressor Design and Production

71. Local AC compressor (ACC) manufacturers often lack practical experience with energy efficient compressor design and production. Although there might be interest among the ACC manufacturers to plan and to produce EE ACCs, this lack of knowhow and experience in the design and manufacturing of EE ACCs is a significant barrier to the development and application of EE RACs that make use of EE ACCs. To address this barrier, in addition to workshop-based training activities, hands-on technical assistance (TA) will be organized and implemented in selected ACC manufacturers. This technical assistance will consist of visits by an international and national ACC expert team to selected ACC manufacturers. The team

will primarily assist the manufacturer in the application of new energy efficient design of ACCs. Moreover, they will discuss with the company management, production and engineering people, and provide technical advice, where applicable, regarding, but not limited to, the following: (1) Proposed design for setting up a new, or modifying an existing, production line for the manufacturing of EE ACCs; (2) Manufacturer's ideas on the, and how to, design EE ACCs; (3) Technical requirements in the application of proven technologies for improving the COP of ACCs; (4) Adopting manufacturing processes to comply with set EE standards for RACs; and, (5) Research and development on the design of EE ACCs.

72. The Expert Team will also provide technical services to the selected manufacturers on technical aspects such as the hands-on application of EE ACC design and manufacturing, as well as troubleshooting of technical problems encountered such as in the following: (1) Design of new energy efficient ACC models; (2) Application of EE ACC design technologies/techniques; (3) Design of EE ACC production lines; (4) Conversion of existing ACC production lines to EE ACC production; and, (5) Operation and maintenance of EE ACC production lines. Technical advice will also be provided in the addressing problems related to research and development on EE ACC design and manufacturing. The Expert Team will provide hands-on TA to manufacturer design and engineering staff, consisting of technical Q&A sessions, review and assessment of existing manufacturing capabilities and provision of suggested improvements on ACC designs and ACC manufacturing, and other hands-on support which manufacturers otherwise are unable to obtain, particularly from high-level international experts. Based on the China Refrigerators Project experience, this form of on-site TA was considered by manufacturers to be highly effective and beneficial.
73. Success in realizing this output will be gauged from the number of completed satisfactory on-site TA provided; number of ACC manufacturers that received on-site TA; and overall average 75% acceptability of TA provided based on the recipient manufacturer's evaluation. An estimated 6 companies will be selected based on a set of selection criteria that will be developed to receive TA.

Activity 1.4.1: Selection of Local ACC Manufacturers for TA Provision

74. Based on the results of the survey conducted in Activity 1.1.1, a set of selection criteria will be developed for use in the selection of local ACC manufacturers that will receive technical assistance. Using the selection criteria, the local ACC manufacturers that were surveyed will be ranked and the top 6 in the ranking will be designated as TA recipients. These manufacturers will be advised about their selection and shall confirm their participation and cooperation. They will be informed about specific requirements (e.g., logistics, work permits, safety permits, engineering drawings, etc.) that they should prepare and provide the members of the Expert Team.

Activity 1.4.2: ACC Manufacturing TA Program

75. This activity will involve the design, preparation, organization of an ACC Technical Assistance Program for 6 local AC manufacturers. An ACC Expert Team comprised on international and national ACC experts that will be engaged by the PEERAC PMO will be assembled to provide the TA services to the selected manufacturers. A preliminary audit of the plant facilities of each manufacturer will be conducted to assess the technical and/or manufacturing issues/concerns and problems that will need TA services from the Expert Team. Thereafter, the TA program will be designed based on the technical assistance needs of the 6 selected manufacturers. The program will also include the schedules (based on the extent of TA service) of the visits of the Expert Team to the manufacturers.

76. Relevant technical personnel (e.g., manufacturing and engineering) of each manufacturer can benefit from Q&A sessions with the team, from discussions of technical design applications and techniques, as well as from observing hands-on TA on the application of new EE ACC design and specific technical problems⁵. The type of TA that will be provided is very much dependent on the TA requirements of each ACC manufacturer, their plans on improving their ACC products, or addressing ACC design and manufacturing technical problems.

Activity 1.4.3: Evaluation of ACC Manufacturing TA Program

77. This activity involves the assessment of the effectiveness of the ACC manufacturing TA program that will be conducted and to come up with relevant recommendations for future continuing TA program on EE ACC design and manufacturing (product commercialization) after the PEERAC project. After each TA services provision, the manufacturer (inclusive of the company personnel that participated in the TA activities) will evaluate the quality of the TA services provided by the Expert Team. Also, the Expert Team will evaluate the manufacturer's preparation for the TA program and the knowledge/skills uptake. The evaluations are expected to provide useful feedback in the design of similar TA programs in the future. As part of the impact analysis of this activity, post TA surveys will be carried out to determine how the local manufacturers are benefiting from the services provided and how they are utilizing the knowledge and skills learned from the TA program.

GEF support is required to support costs for the fees and travel costs of the international and national experts that will be engaged to provide the technical assistance to local ACC manufacturers.

Output 1.5: Commercialized EE Compressor Products

78. To deliver this project output, the ACC manufacturers that received capacity development and technical assistance will complete the commercialization of new energy efficient models. Because risk adversity and market insecurity inhibit EE product commercialization, the project will provide compressor manufacturers with incremental cost funding support via a manufacturer incentive program. ACC manufacturers will develop new energy efficient designs which will then be submitted to the project as competitive bids for receipt of incentive funding on a competitive, least-cost, and tiered basis to award recipients. In addition to competitive incentive funding, participating manufacturers that fulfill project requirements will also receive basic award funding (\$5-20K per manufacturer depending on size) in order to help cover their fixed costs of participating in the project and meeting project requirements. From a monitoring and compliance perspective, this basic level of funding allows the PMO to enter into binding legal contracts with manufacturers, giving the PMO the legal right monitor contract compliance, and the manufacturer the legal right to receive funding if project requirements are met.
79. GEF funds will be leveraged by significant investment by manufacturers on the production of the EE ACC models, commitment of which will be a condition of participation in the project. The competitive bid structure serves the dual purpose of maximizing project impact by awarding incentive funding to those who achieve the highest level of EE savings, and simultaneously using the price-discovery mechanism of a competitive bid structure to

⁵ Example of possible areas where technical assistance maybe requested by ACC manufacturers for the improvement of the AC compressor efficiency includes: (i) Compressor motor efficiency improvements; (ii) Application of variable speed systems; and, (iii) Use of heavy-duty compressor sound blanket to reduce compressor sound levels.

determine and minimize incremental costs. Furthermore, through provision of this incentive funding, baseline manufacturer funds that would otherwise have been allocated to other users (e.g., investment in development of non-efficient products, marketing of non-efficient products, or distribution as corporate profits) are instead allocated to development and commercialization of new energy efficient compressors.

80. The successful delivery of this output will be gauged by the number of compressor manufacturers signing participation contracts to participate in the program (~6 manufacturers representing 50 - 60% of national sales is targeted), number of new high efficient compressors (15% EE relative to baseline) developed and incentive bids submitted, number of new top efficiency models receiving incentive funding (3 models targeted), number of new EE models commercialized, average improvement in the Coefficient of Performance (COP) for locally manufactured ACCs by EOP (target 10%+), and average market share for high efficiency ACCs by EOP increases by 10%. For further information on the incentive program, see Annex 1 (Manufacturer Incentive Awards).

Activity 1.5.1: Product Commercialization Contracting and Mobilization

81. Based on the survey of local ACC manufacturers, the PMO will identify manufacturers that will be targeted for the new EE ACC product commercialization. This program is aimed at applying the knowledge/skills gained by the ACC manufacturers from the technical training and technical assistance provided by the project. The target is to select the manufacturers that collectively represent 50% to 60% of the local ACC sales, and most likely these are the companies that will participate in the technical training courses and in the TA program. The PMO shall negotiate and sign project participation contracts delineating product commercialization and other responsibilities during the first year of the project.

Activity 1.5.2: Product Design Implementation

82. The product design by manufacturers will take place over a 6 month period during the third year of the project. It will take place after the completion of technical training and technical assistance program. The impacts of the capacity development activities and technical assistance program will be reflected in the improved product design. ACC manufacturers will both implement general design improvements in order to increase average compressor efficiency (10% by EOP), and will develop at least one new high efficiency (15% over baseline COP) models (or series of models) to submit for competitive incentive funding to the PMO.

Activity 1.5.3: Selection of Product Commercialization Models

83. This activity will involve the selection of 3 EE ACC product models designed by the local ACC manufacturers. An expert group will be formed to select these 3 models based on a set of criteria that will include, among others, the compressor Coefficient of Performance (COP), incremental cost of the EE features incorporated in the product, availability of the existing production infrastructure to allow manufacturing of the new improved product, the incremental cost of the additions or modifications to the existing production lines to enable the manufacturing of the new EE product. The bids (which include the new EE ACC designs) that will be submitted by the ACC manufacturers for the competitive incentive financing will be evaluated by the expert group based on the set criteria⁶.

⁶ In case by the time the ACC product commercialization program implementation a widely recognized and accepted HCFC refrigerant substitute (low GWP, low ODP and high energy efficiency performance) is already commercially available, the design of the new EE air conditioning compressors based on the use of such

Activity 1.5.4: Product Commercialization Implementation

84. This activity involves the application on the new EE ACC designs by the participating local ACC manufacturers. Over a six month period during the project's fourth year of implementation, the local ACC manufacturers will commercially produce the new high efficiency models of ACCs. The ACC experts working on the project will provide technical support on an as-needed basis.

Activity 1.5.5: Monitoring and Review of the Product Commercialization Program

85. This activity involves the assessment of the effectiveness of the new EE ACC product commercialization activities of the project. In the fourth year of the project and immediately following the product commercialization period, the PMO, supported by international and national experts and subcontractors, will review collected technical as well as operational data to: (1) Verify the results of the product commercialization activities carried out by the ACC manufacturers; (2) Assess the benefits and impacts of the new EE ACC product design applications, mainly in terms of sales, i.e., number of such ACCs that will be used in the manufacture of EE RACs; and, (3) Ensure that incentive funding recipients have met all contractual and project requirements.

GEF support is required to cover the incremental costs of development, production, and sale of energy efficient ACC models

Output 1.6: Compilation of ACC Market and Performance Information

86. Information on compressor production, sales, efficiency levels, and other technical data will be collected from ACC manufacturers. The regular provision of these data will be a contractual requirement for participation in the project. Data provided by manufacturers will be verified by independent product testing (described below) and used to monitor and evaluate project activities, quantify project results, and to provide support for other project activities which require that data (e.g., standards and labeling activities).
87. Since manufacturers consider some data confidential and proprietary, manufacturers will be assured (and the PMO and its subcontractors will be contractually bound) to use data only for project purposes. In order to maintain corporate confidentiality, overall data will be published in aggregate form without corporate identification, so as to prevent release of confidential business information. An Air-Conditioning Market Information System (AMIS) will be designed and established for purposes of data gathering and processing and data banking. In addition to ACC data, the AMIS will include information regarding retention of ACC manufacturer staff receiving training through the project in order to determine the efficacy of project training programs.

Activity 1.6.1: Air Conditioner Information System Design and Establishment

88. Building on the assessments that were carried out during the PPG exercise regarding the inventory of information available regarding the local ACC industry, a more thorough gap analysis will be carried out to: (1) Determine the various information that need to be collected; (2) Identify the reliable sources of such information; (3) Establish how such

refrigerant, shall be included as one of the criterion for the selection of the 3 winning new EE ACC product models that will be promoted for commercial production.

information shall be obtained, validated, processed, and kept; and, (4) Find out the cost-effective way of making the information available and accessible to the ACC industry. In order to facilitate the data gathering, data processing, data banking and dissemination an information system⁷, hereinafter referred to as the Air-Conditioning Market Information System (AMIS)⁸ will be designed and established. AMIS will be operated and maintained by an appropriate entity that will be identified during the project implementation. During the project, the design, operation and maintenance of the AMIS will be sub-contracted to a qualified Information Technology Services entity. Terms of Reference for the sub-contractor will be developed specifying the tasks involved, which will include among others: (1) Diligent process for the selection of the suitable entity that will operate and maintain the AMIS after the PEERAC project; and, (2) Training of the personnel of the selected entity in the operation and maintenance of the AMIS.

Activity 1.6.2: ACC Information Collection and Annual Reporting

89. This activity will involve the collection and annual reporting of ACC data. The required data shall be collected, processed, and reported in the first quarter of the following year of the project. Data will be provided by ACC manufacturers to the PEERAC-appointed sub-contractor in hard copy and/or when available, electronically (based on how individual manufacturers maintain that data). The sub-contractor will collate the data and report results, using summary data so as to mask proprietary information for data being published outside the project⁹ into the AMIS. The final data report will include evaluation results for knowledge/skill uptake and application; and trained personnel retention. These tasks will be regularly carried out by the selected entity that will operate and maintain the AMIS after the PEERAC project.

GEF support is required support the database development and management, provision of assistance in data gathering, provision of information to manufacturers on energy efficiency gains, and monitoring and verification of project impact.

Output 1.7: Completed EE Compressor Product Testing

90. The effectiveness of the project interventions on improving the energy efficiency of ACCs, as well as the ACC manufacturer performance will be verified through product testing. The provision of ACC product samples for testing will be required for participation in the project. Test results will be used to monitor and evaluate project activities, quantify project results, and to provide support for other project activities which require test data (e.g., energy efficient ACC and RAC design). The success criteria in the delivery of this output include the number of ACC manufacturers participating in the product testing each year; the number of ACC products tested each year and the results thereof; and the proportion of data users (standards and labeling agencies, manufacturers) giving a positive impact rating to the test data's contribution in improving ACC energy efficiency.

⁷ The information system shall include a database system for the data banking of data/information collected. The database will include the different information to be collected as identified in Activity 1.6.1, as well as annual reports that will be submitted to the entity that will be designated to operate and maintain the system. The subcontractor shall also, when required, be able to provide assistance to the manufacturers in the preparation of their annual reports.

⁸ The information system AMIS shall be for the gathering, processing, and data banking of information from ACC and RAC manufacturers. This will also be used in the Compilation of RAC Market and Performance Information in Component 2

⁹ Project consultants will have full access to data as necessary, but will sign confidentiality agreements to ensure that any confidential data so remains.

Activity 1.7.1: AC Compressor Testing Center Establishment

91. The verification of the improvement of the energy utilization performance of ACCs will be done through product testings that will be carried out by an ACC testing facility. Such facility will be selected and designated as the project's ACC Testing Center. The ACC Testing Center will be established during the first year of the project. Terms of Reference for the designated ACC Testing Center will be developed and a diligent process for the selection of the suitable test facility will be carried out. Moreover, specifications and guidance for the required test procedures and protocols and compliance with pertinent Chinese standards will be developed for, and used by, the designated ACC Testing Center.

Activity 1.7.2: ACC Product Testings

92. This activity involves the conduct of 3 rounds of ACC product performance testing during the first, fourth, and fifth years of the project by the designated ACC Testing Center. Apart from the testing of required quality parameters, the energy performance of the ACC product will be tested. All ACC manufacturers will be required to participate in the product testing and provide test samples to the ACC Testing Center. The testing procedures will be in accordance with Chinese testing procedures and standards¹⁰.

Activity 1.7.3: ACC Product Testing Results Reporting

93. This activity will involve the analysis of the results of the ACC product testings. Each ACC manufacturer will receive a copy of the report on the results of the testing of their product(s) including the analysis of the results, and recommendations for improvement of the product quality and/or energy performance. The ACC Testing Center will collate all the test results data and analysis results, using summary data so as to mask proprietary information for data being published outside the project¹¹. The final data report will include evaluation results on technical assistance impact on ACC product energy performance, and product testing data impact.

GEF support is required to ensure that necessary testing is completed to support other GEF-funded activities, provide information to manufacturers on energy efficiency gains, and monitor and verify project impact.

COMPONENT 2: RAC EFFICIENCY UPGRADES

94. This project component is intended to address the technical and financial barriers that prevent room air conditioner (RAC) manufacturers from developing more energy efficient products. In the absence of activities implemented under this component, local RAC manufacturers would not implement significant EE activities and no significant RAC EE gains would be achieved. More locally produced high efficiency room air conditioners is the expected outcome from the interventions that will be carried out under this project component. It is expected that RAC manufacturers representing at least 75% of domestic RAC sales will participate in the various activities that have been line up under this project component. The realization of the expected outcome will be gauged from increased average

¹⁰ The ACC Testing Center will apply the officially recognized testing procedures and protocols for AC compressors. In this regard, it will coordinate with the China National Institute for Standards, and the China Standards Certification Center, which are involved in the UNDP-GEF BRESL.

¹¹ Project consultants will have full access to data as necessary, but will sign confidentiality agreements to ensure that any confidential data so remains.

efficiency of locally manufactured RACs (at least 10% higher); and; increased market share (targeted 10% increase) for EE RACs.

95. The implementation of the planned activities under this component have generally been scheduled to follow those carried out under Component 1, given that development of energy efficient AC compressors must take place prior to development of energy efficient room air conditioners.

Output 2.1: International Technical Training on High Efficiency RAC Design and Manufacturing

96. Many RAC design engineers lack information and exposure to internationally available high efficiency technologies and design techniques. An international training workshop and as well as study tours to international RAC design facilities will be organized for a projected 12 RAC manufacturer trainees. Trainees will receive technical training and exposure to advanced RAC technologies and in the design and manufacture of energy efficient RACs. The activity will take place during the second year of the project, after completion of a similar type of international training for ACC manufacturers. Success in delivering this output will be measured by the number of training activities successfully completed; trainee satisfaction levels of the training activities; percentage of trainees gainfully employed in high efficiency RAC design/production; and trainee employment retention levels.

Activity 2.1.1: International Room Air Conditioner Technology Training Course Design and Implementation

97. This activity will involve the design, preparation, organization of an international RAC technology training course that will take place during the second year of the project. It will be on advanced RAC design and application technologies. The training course will also involve visits to international RAC design facilities. With the advice of experts, the PMO will identify and select international training institutes that can design the appropriate training course for the local EE RAC manufacturers based on the results of the capacity needs assessment in Activity 2.2.1. Foreign EE RAC manufacturers that can host the trainees for the demonstration of advanced EE RAC design and production techniques will also be identified. Arrangements for the visits to these manufacturing facilities will be made. About 12 RAC manufacturer trainees will take part in the training course.

Activity 2.1.2: Evaluation of International Room Air Conditioner Technical Training

98. This activity involves the assessment of the effectiveness of the international training course that will be conducted. It will be conducted in conjunction with Activity 2.2.3, and will also come up with relevant recommendations for future continuing training program on EE RAC design and manufacturing (product commercialization) after the PEERAC project. After the foreign training course, the trainees will evaluate the quality of the training provided. The training experts will evaluate trainee preparation for the training, and knowledge/skills uptake. The evaluation is expected to provide useful feedback in the design of similar training programs in the future. In conjunction with Activity 2.2.3, the impact analysis of this activity will be assessed through post training surveys that will be carried out to determine how the recipients of the training are utilizing the knowledge and skills that they learned in their respective work in the ACC/RAC manufacturing industry or ACC/RAC service market.

GEF support is required for the technical assistance in the design and evaluation of the training course, including the cost for the implementation international training course and training expenses

Output 2.2: In-country technical training on high efficiency RAC design and manufacturing

99. Technical training activities for RAC manufacturer staff were designed with the aim of maximizing training effectiveness and attractiveness to participating manufacturer trainees through a combination of various training approaches, drawing on the successful experience of China Refrigerator Project. Senior international and national RAC experts who are knowledgeable and experienced in EE RAC design and production will be engaged for the training program. Participating manufacturers will be encouraged to adopt team-based design approaches in order to minimize employee retention risks, and multiple individuals from 6 manufacturers will receive training. In the absence of GEF support, no such training would be completed, and RAC manufacturer lack of familiarity with energy efficient technology would not be addressed. Successful delivery of this output will be measured by the number of training activities successfully completed; trainee satisfaction levels of the training activities; percentage of trainees gainfully employed in high efficiency RAC design/production; and trainee employment retention levels.
100. One particular topic that will be included in the training course is refrigerant replacement. This is in line with the move to address Montreal Protocol objectives of eliminating ozone depleting substances (ODS), which the present types of refrigerants used in RACs are included. An integrated approach in dealing with the energy efficiency and ODS objectives will be a very important subject matter that have to be covered in the training program.

Activity 2.2.1: Capacity Needs Assessment of Local RAC Manufacturers

101. A survey will be conducted to determine and evaluate the current level of capacity of the local RAC manufacturing industry to design and manufacture energy efficient RACs. The results of the assessment will be used in designing a training program for improving the knowledge and skills of the industry in the manufacture of EE RACs, as well as in the provision of technical assistance (Activities 2.4.1-2.4.3).

Activity 2.2.2: RAC Technology Training Workshop Design and Implementation

102. This activity will involve the design, preparation, organization of 2 in-country RAC technology training workshops that will take place in the second and third year of the project. It will be on EE RAC design and product commercialization. The training materials will be prepared by experts that will be engaged, and will be based on the results of the assessment carried out in Activity 2.2.1. For the first training workshops, RAC manufacturer trainees (estimated 24 trainees from 12 participating RAC manufacturers) will receive training on energy efficient RAC design and product commercialization, in country. For the second training workshop, the approach (if necessary), will be modified based on the findings/recommendations of the evaluation of the first training workshop. It is estimated that the same number of trainees (24) from another 12 participating RAC manufacturers will receive the training.

Activity 2.2.3: Evaluation of In-Country RAC Technical Training

103. This activity involves the assessment of the effectiveness of the in-country training courses that will be conducted and to come up with relevant recommendations for future

continuing training program on EE RAC design and manufacturing (product commercialization) after the PEERAC project. After each training workshop, the trainees will evaluate the quality of the training provided. Also, the training experts will evaluate trainee preparation for the training, and knowledge/skills uptake. The evaluations are expected to provide useful feedback in the design of similar training programs in the future. As part of the impact analysis of this activity, post training surveys will be carried out to determine how the recipients of the training are utilizing the knowledge and skills that they learned in their respective work in the ACC/RAC manufacturing industry or ACC/RAC service market.

GEF support is required for the necessary technical assistance in the design, implementation and evaluation of the training programs.

Output 2.3: Completed Intensive RAC Design Training

104. The local RAC manufacturers will be provided applied intensive training and technical support at an international RAC training and design center. Participating manufacturers first develop initial high efficiency RAC prototypes which will be shipped to the training center. Each manufacturer will then send a team of designers to the design center to work with the experts of the center staff in further improving the prototype. Manufacturers will be divided into groups (four groups of six each for a total of 24 trainees) so as not to overwhelm the training center's capabilities and in order to ensure more hands-on attention for each group. Each group will receive 3 months of intensive hands-on training and design support. Based on the China Refrigerator Project experience, this activity was considered by manufacturers and project experts to have been highly effective and with high impacts. Each manufacturer will send 1 to 2 trainees for the training.

Activity 2.3.1: Development of Intensive RAC Design Training Course

105. The intensive training on RAC design will be carried out by an international RAC training and design center. This activity will involve the identification and selection of such facility, based on Terms of Reference that will also be developed for purposes of selecting the suitable partner institution, and the development of the hands-on design training course. An evaluation of potential centers from other countries that can provide the required training and skills upgrading of the technical personnel of local RAC manufacturers will be carried out based on the terms of reference.
106. The selected center will be tasked to design an intensive RAC design training course based on the survey that was conducted in Activity 2.2.1, and results of the earlier local and international training activities on EE RAC design and manufacturing. Specifications and guidance for the required coverage and content of the special design training will be developed for, and used by, the center in designing the training course. Inputs from the PEERAC project experts and from the RAC manufacturers will also be considered in the design of the course. As in the in-country training program, the intensive training program shall include the technical and economic aspects of the application of low GWP and non-ODS refrigerants in RACs. An integrated approach in dealing with the energy efficiency and ODS objectives will be a very important subject matter that have to be covered in the intensive RAC design training.
107. The PMO, project experts, RAC manufacturers, and the design center will prepare for the intensive design training course that will be implemented in Years 3 and 4 of the project.

The participating RAC manufacturers will develop their initial RAC prototypes. Preparations will begin in the first half of year 3 and last for six months.

Activity 2.3.2: Preparation of Initial RAC Prototypes/Models

108. The RAC manufacturers that will be the beneficiaries of the training course will be selected based on a set of selection criteria that the PEERAC PMO will develop. After the selection of the manufacturers, and approval of their participation, they will be instructed to prepare the initial prototype of their planned new EE RAC model. Utilizing their own in-house design ideas and the knowledge/skills that they have gained either from the PEERAC training programs or from other sources, they will come up with the EE RAC model that they (i.e., trainees from their respective companies) will improve on during the training course.

Activity 2.3.3: Conduct and Evaluation of the Intensive RAC Design Training Course

109. In the 4th Quarter of the third year of the project and in the 1st Quarter of the fourth year, the training course will be conducted 4 times each time participated in by six trainees. Each group of trainees will undergo intensive hands-on training and design support at the international training center for two months. Thereafter, an assessment of the effectiveness of the training course that will be conducted and to come up with relevant recommendations for future continuing training course on EE RAC design and manufacturing (product commercialization) after the PEERAC project. After completion of each training course, the trainees will evaluate the quality of the training provided. Also, the training experts will evaluate trainee preparation for the training, and knowledge/skills uptake. The evaluations are expected to provide useful feedback in the design of similar training programs in the future. As part of the impact analysis of this activity, post training surveys will be carried out to determine how the recipients of the training are utilizing the knowledge and skills that they learned in their respective work in the RAC manufacturing industry or RAC service market.

GEF support is required to cover the cost of preparing and providing the intensive design training by the competitively selected training subcontractor, and for covering the living costs of training participants during the activity.

Output 2.4: Completed Technical Assistance on EE RAC Design and Production

110. Local room air conditioner (RAC) manufacturers often lack practical experience with energy efficient RAC design and production. While there might be interest among the RAC manufacturers to plan and produce EE RACs, this lack of knowhow and experience in the design and manufacturing of EE RACs is a significant barrier to the development and application of EE RACs in China's commercial & residential sectors. To address this barrier, in addition to workshop-based training activities, hands-on technical assistance (TA) will be organized and implemented in selected RAC manufacturers. This technical assistance will consist of visits by an international and national RAC expert team to selected RAC manufacturers. The team will primarily assist the manufacturer in the application of new energy efficient design of RACs. Moreover, they will discuss with the company management, production and engineering people, and provide technical advice, where applicable, regarding, but not limited to, the following: (1) Proposed design for setting up a new, or modifying an existing, production line for the manufacturing of EE RACs; (2) Manufacturer's ideas on the, and how to, design EE RACs; (3) Technical requirements in the application of proven technologies for improving the Energy

Efficiency Rating (EER) of RACs; (4) Adopting manufacturing processes to comply with set EE standards for RACs and RACs; and, (5) Research and development on the design of EE RACs.

111. The Expert Team will also provide technical services to the selected manufacturers on technical aspects such as the hands-on application of EE RAC design and manufacturing, as well as troubleshooting of technical problems encountered such as in the following: (1) Design of new energy efficient RAC models; (2) Application of EE RAC design technologies/techniques; (3) Design of EE RAC production lines; (4) Conversion of existing RAC production lines to EE RAC production; and, (4) Operation and maintenance of EE RAC production lines. Technical advice will also be provided in the addressing problems related to research and development on EE RAC design and manufacturing. The Expert Team will provide hands-on TA to manufacturer design and engineering staff, consisting of technical Q&A sessions, review and assessment of existing manufacturing capabilities and provision of suggested improvements on RAC designs and RAC manufacturing, and other hands-on support which manufacturers otherwise are unable to obtain, particularly from high-level international experts. Based on the China Refrigerators Project experience, this form of on-site TA was considered by manufacturers to be highly effective and beneficial.
112. Success in realizing this output will be gauged from the number of completed satisfactory on-site TA provided; number of RAC manufacturers that received on-site TA; and overall average 75% acceptability of TA provided based on the recipient manufacturer's evaluation. An estimated 12 manufacturers will be selected based on a set of selection criteria that will be developed to receive TA.

Activity 2.4.1: Selection of Local RAC Manufacturers for TA Provision

113. Based on the results of the survey conducted in Activity 2.2.1, a set of selection criteria will be developed for use in the selection of local RAC manufacturers that will receive technical assistance. Using the selection criteria, the local RAC manufacturers that were surveyed will be ranked and the top 12 in the ranking will be designated as TA recipients. These manufacturers will be advised about their selection and shall confirm their participation and cooperation. They will be informed about specific requirements (e.g., logistics, work permits, safety permits, engineering drawings, etc.) that they should prepare and provide the members of the Expert Team.

Activity 2.4.2: RAC Manufacturing TA Program

114. This activity will involve the design, preparation, organization of an RAC Technical Assistance Program for 12 local AC manufacturers. An RAC Expert Team comprised on international and national RAC experts that will be engaged by the PEERAC PMO will be assembled to provide the TA services to the selected manufacturers. A preliminary audit of the plant facilities of each manufacturer will be conducted to assess the technical and/or manufacturing issues/concerns and problems that will need TA services from the Expert Team. Thereafter, the TA program will be designed based on the technical assistance needs of the 12 selected manufacturers. The program will also include the schedules (based on the extent of TA service) of the visits of the Expert Team to the manufacturers.
115. Relevant technical personnel (e.g., manufacturing and engineering) of each manufacturer can benefit from Q&A sessions with the team, from discussions of technical design applications and techniques, as well as from observing hands-on TA on the application of

new EE RAC design and specific technical problems¹². The type of TA that will be provided is very much dependent on the TA requirements of each RAC manufacturer, their plans on improving their RAC products, or addressing RAC design and manufacturing technical problems.

Activity 2.4.3: Evaluation of RAC Manufacturing TA Program

116. This activity involves the assessment of the effectiveness of the RAC manufacturing TA program that will be conducted and to come up with relevant recommendations for future continuing TA program on EE RAC design and manufacturing (product commercialization) after the PEERAC project. After each TA services provision, the manufacturer (inclusive of the company personnel that participated in the TA activities) will evaluate the quality of the TA services provided by the Expert Team. Also, the Expert Team will evaluate the manufacturer's preparation for the TA program and the knowledge/skills uptake. The evaluations are expected to provide useful feedback in the design of similar TA programs in the future. As part of the impact analysis of this activity, post TA surveys will be carried out to determine how the local manufacturers are benefiting from the services provided and how they are utilizing the knowledge and skills learned from the TA program.

GEF support is required to support costs for the fees and travel costs of the international and national experts that will be engaged to provide the technical assistance to local RAC manufacturers.

Output 2.5: Commercialization of EE RAC Products

117. RAC manufacturers will complete commercialization of new energy efficient models. Because risk adversity and market insecurity inhibit EE product commercialization, the project will provide air conditioner manufacturers with incremental cost funding support via a manufacturer incentive program. RAC manufacturers will develop new energy efficient designs which will then be submitted to the project as competitive bids for receipt of incentive funding on a competitive, least-cost, and tiered basis to award recipients, with awards issued to the most energy efficient products and greatest energy savings delivered.¹³ In addition to competitive incentive funding, participating manufacturers that fulfill project requirements will also receive basic award funding in order to help cover their fixed costs of participating in the project and meeting project requirements such as the 10% average EE increase across their product lines. From a monitoring and compliance perspective, this basic level of funding allows the PMO to enter into binding legal contracts with manufacturers, giving the PMO the legal right monitor contract compliance, and the manufacturer the legal right to receive funding if project requirements are met.

¹² Examples of technical assistance that may be provided to RAC manufacturers includes: (1) Evaluation of high EER RAC models from abroad to verify feasibility of adopting new design features in local RAC units; (2) Investigation and evaluation of the feasibility of applicable improvements in the RAC design and in the local RAC manufacturing process; (3) Dynamic modeling and evaluation of complete electromechanical and thermodynamic system of RAC units; (4) Design synthesis and optimization of compressor system and RAC unit; (5) Development of low cost RAC unit controller to match adaptively the cooling capacity of the compressor to heat loads so as to minimize energy consumption; (6) Performance and energy audits on current and proposed RAC technologies; (7) Improvement of heat exchanger design to improve energy utilization efficiency (i.e., EER) such as (i) Increased frontal coil area and tube rows; (ii) Increased fin density; and, (iii) Improved fin and tube design; (8) Improved condenser fan motors; (9) Improvement of controls; and, (6) Energy efficient AC system design applications

¹³ Total energy savings calculated as unit efficiency gain relative to baseline sales.

118. GEF funds will be leveraged by significant investments by manufacturers in the production of EE RAC models, commitment of which will be a condition of participation in the project. The competitive bid structure serves the dual purpose of maximizing project impact by awarding incentive funding to those who achieve the highest level of EE savings, and simultaneously using the price-discovery mechanism of a competitive bid structure to determine and minimize incremental costs. Furthermore, through provision of this incentive funding, baseline manufacturer funds that would otherwise have been allocated to other users (e.g., investment in development of non-efficient products, marketing of non-efficient products, or distribution as corporate profits) are instead allocated to development and commercialization of new energy efficient air conditioners.
119. The successful delivery of this Output will be gauged by number of RAC manufacturers signing participation contracts to participate in the program (~12 manufacturers representing 75% of national sales is targeted), 12 new high efficient air conditioners (10% EE relative to baseline) developed and incentive bids submitted, 12 new high efficiency models receiving varying levels of incentive funding, average improvement in Energy Efficiency Ratio (EER) for locally manufactured RACs by EOP (target 10%+), and average market share for high efficiency RACs by EOP increases to 15%. For further information on the incentive program, see Annex 1 (Manufacturer Incentive Awards).

Activity 2.5.1: Product Commercialization Contracting and Mobilization

120. Based on the survey of local RAC manufacturers, the PMO will identify manufacturers that will be targeted for the new EE RAC product commercialization. This program is aimed at applying the knowledge/skills gained by the RAC manufacturers from the technical training and technical assistance provided by the project. The target is to select the manufacturers that collectively represent 75% of the local RAC sales, and most likely these are the companies that will participate in the technical training courses and in the TA program. The PMO shall negotiate and sign project participation contracts delineating product commercialization and other responsibilities during the first year of the project.

Activity 2.5.2: Product Design Implementation

121. The product design by manufacturers will take place over a 6 month period during the fourth year of the project. It will take place after the completion of technical training and technical assistance program. The impacts of the capacity development activities and technical assistance program are reflected in improved product design. RAC manufacturers will both implement general design improvements in order to increase average room air conditioner (10% by EOP), and will develop at least one new high efficiency (20% over baseline COP) models (or series of models) to submit for competitive incentive funding to the PMO.

Activity 2.5.3: Selection of Product Commercialization Models

122. This activity will involve the selection of 6 EE RAC product models designed by the local RAC manufacturers. An expert group will be formed to select these 6 models based on a set of criteria that will include, among others, the RAC Energy Efficiency Ratio (EER), incremental cost of the EE features incorporated in the product, availability of the existing production infrastructure to allow manufacturing of the new improved product, the incremental cost of the additions or modifications to the existing production lines to enable the manufacturing of the new EE product. The bids (which include the new EE RAC

designs) that will be submitted by the RAC manufacturers for the competitive incentive financing will be evaluated by the expert group based on the set criteria¹⁴.

Activity 2.5.4: Product Commercialization Implementation

123. This activity involves the application on the new EE RAC designs by the participating local RAC manufacturers. Over a one year period after the project's fourth year of implementation, the local RAC manufacturers will commercially produce the new high efficiency models of RACs. The RAC experts working on the project will provide technical support on an as-needed basis.

Activity 2.5.5: Monitoring and Review of the Product Commercialization Program

124. This activity involves the assessment of the effectiveness of the new EE RAC product commercialization activities of the project. In the fourth year of the project and immediately following the product commercialization period, the PMO, supported by international and national experts and subcontractors, will review technical and other data to: (1) Verify the results of the product commercialization activities carried out by the RAC manufacturers; (2) Assess the benefits and impacts of the new EE RAC product design applications, mainly in terms of sales; and, (3) Ensure that incentive funding recipients have met all contractual and project requirements.

GEF support is required to cover the incremental costs of development, production, and sale of energy efficient RAC models

Output 2.6: RAC Efficiency Standard

125. Under Component 2, support for further development and improvement of China's minimum energy efficiency standard for RACs will be provided. The project targets at least a 10% increase in minimum and non-weighted average standard EER¹⁵.
126. The project will work closely with GOC agencies responsible for standard setting on the tasks to be done to deliver this output in order to ensure coordination at high levels and full consideration of stakeholder objectives and constraints. Revised EE standards will be drafted to enhance enforcement. Standard setting activities will be combined with EE product promotion and training to increase impact and improve enforcement potential. Activities to deliver this output will be coordinated with and benefit from data collected by the AMIS and Testing Center.

Activity 2.6.1: Development of RAC Energy Performance Standards

127. Experts on energy efficiency standards & labeling for RACs working for the project will coordinate with the CSC and CNIS in the development of applicable energy performance standards for RACs. They will work together with the China Country Team that is responsible for the implementation of the agreed national activities under an ongoing

¹⁴ In case by the time of the RAC product commercialization program implementation a widely recognized and accepted HCFC refrigerant substitute (low GWP, low ODP and high energy efficiency performance) is already commercially available, the use of such refrigerant in the design of the new EE RAC models, shall be included as one of the criterion for the selection of the 3 winning new EE RAC product models that will be promoted for commercial production.

¹⁵ This is relative to the current ratings: Minimum = 2.6 EER; Top-ranked = 3.4 EER; and, Non-weighted average = 3.0 EER.

regional UNDP-GEF project participated in by China¹⁶. Among these are work to be carried out under the Technical Working Group on RACs; development of model test procedures for RACs; and enhancement of energy performance standards for RACs.

Activity 2.6.2: Revision of Current RAC Energy Performance Standards

128. A study will be conducted to determine the feasible enhancements that can be proposed and applied to the current set standards (e.g., Minimum Energy Performance Standards - MEPS) for RACs based on work carried out with the China BRESL Country Team. The current MEPS for RACs will be reviewed and possible modifications proposed, which will include considerations for a harmonized regional energy performance standard, which is one of the outcomes of the BRESL project. A workshop will be organized and conducted for the purpose of introducing the proposed modifications (in the form of revised standards) to the pertinent GOC institutions and the local ACC and RAC manufacturers, and soliciting their comments and recommendations.

Activity 2.6.3: Formal & Informal Discussions on Revised Standards

129. This involves the organization and conduct of a series of formal and informal meetings with the pertinent standard setting agencies as well as policy makers in order to familiarize them with the new proposed enhanced standards. Where necessary, discussions can be on the energy efficiency aspects of RAC manufacturing and application; and the impacts of a regional RAC energy performance standard on the trading of locally made RACs in other Asian countries. Other objectives of the formal/informal discussion could be clarification of issues on the country policies on energy performance standards; requirements that are to be complied with to obtain necessary approvals, and gain support for energy standards policy initiatives. It is expected that through these series of advocacy and lobbying initiatives, the new standards for RACs will be approved and enforced.

Activity 2.6.4: Publication and Capacity Building on the Revised Standards Compliance

130. This will involve the printing and dissemination of the approved standards for RACs. Special one-day training workshops will be conducted for local RAC manufacturers on how to comply with the set standards, in order to meet local market requirements as well as those of the export market.

Activity 2.6.5: Evaluation of the Impacts of the Revised Standards Enforcement

131. In collaboration with the M&E activities of the China BRESL Country Team, and utilizing the reports submitted for inclusion in the ACC & RAC Information System, as well as the test results from the RAC Testing Center; the PEERAC PMO will track the impacts of the enforcement of the revised standards. The impact would most likely be reflected in the market share of EE RACs, and possibly the change in the annual exports of locally made RACs.

GEF support is required to provide support by international and national project experts to standards setting bodies and to enable standard setting bodies to make use of advanced technical standard setting procedures.

¹⁶ This is the Barrier Removal to the Cost Effective Development and Implementation of Energy Standards and Labeling Programs (BRESL) Project participated in by Bangladesh, China, Indonesia, Pakistan, Thailand and Vietnam.

Output 2.7: Compilation of RAC Market and Performance Information

132. Information on room air conditioner production, sales, efficiency levels and other technical data will be collected from RAC manufacturers. The regular provision of these data will be a contractual requirement for participation in the project. Data provided by manufacturers will be verified by independent product testing (described below) and used to monitor and evaluate project activities, quantify project results, and to provide support for other project activities which require that data (e.g., standards and labeling activities).
133. Since manufacturers consider some data confidential and proprietary, manufacturers will be assured (and the PMO and its subcontractors will be contractually bound) to use data only for project purposes. In order to maintain corporate confidentiality, overall data will be published in aggregate form without corporate identification, so as to prevent release of confidential business information. Information obtained from the RAC manufactures will be encoded in the Air-Conditioning Market Information System (AMIS) that is developed in Activity 1.6.1. In addition to RAC data, the AMIS will also include information regarding retention of RAC manufacturer staff receiving training through the project in order to determine the efficacy of project training programs.

Activity 2.7.1: Definition of RAC Information for Inclusion in AMIS

134. Building on the assessments that were carried out during the PPG exercise regarding the inventory of information available regarding the local RAC industry, a more thorough gap analysis will be carried out to: (1) Determine the various information that need to be collected; (2) Identify the reliable sources of such information; (3) Establish how such information shall be obtained, validated, processed, and kept; and, (4) Find out the cost-effective way of making the information available and accessible to the RAC industry. Based on the assessment results, the pertinent database modules in the AMIS will be developed. This will be done in conjunction with the AMIS design in Activity 1.6.1. The RAC modules in the AMIS database will also include annual reports that will be submitted by the RAC manufacturers, as well as high efficiency RAC models available in the market in order to allow consumers to compare different models and their energy use¹⁷.

Activity 2.7.2: RAC Information Collection and Annual Reporting

135. This activity will involve the collection and annual reporting of RAC data. The required data shall be collected, processed, and reported in the first quarter of the following year of the project. Data will be provided by RAC manufacturers to the PEERAC-appointed sub-contractor in hard copy and/or when available, electronically (based on how individual manufacturers maintain that data). The sub-contractor will collate the data and report results, using summary data so as to mask proprietary information for data being published outside the project¹⁸ into the AMIS. The final data report will include evaluation results for knowledge/skill uptake and application; and trained personnel retention. These tasks will be regularly carried out by the selected entity that will operate and maintain the AMIS after the PEERAC project.

¹⁷ The target number of purchase decisions influenced by such information that can be obtained from the database by end of project is about 10,000, which will be verified through consumer surveys.

¹⁸ Project consultants will have full access to data as necessary, but will sign confidentiality agreements to ensure that any confidential data so remains.

GEF support is required support the database development and management, provision of assistance in data gathering, provision of information to manufacturers on energy efficiency gains, and monitoring and verification of project impact.

Output 2.8: Completed EE RAC Product Testing

136. The effectiveness of the project interventions on improving the energy efficiency of RACs, as well as the RAC manufacturer performance will be verified through product testing. The provision of RAC product samples for testing will be required for participation in the project. Test results will be used to monitor and evaluate project activities, quantify project results, and to provide support for other project activities which require test data (e.g., energy efficient RAC and RAC design). The success criteria in the delivery of this output include the number of RAC manufacturers participating in the product testing each year; the number of RAC products tested each year and the results thereof; and the proportion of data users (standards and labeling agencies, manufacturers) giving a positive impact rating to the test data's contribution in improving RAC energy efficiency.

Activity 2.8.1: Room Air Conditioner Testing Center Establishment

137. The verification of the improvement of the energy utilization performance of RACs will be done through product testings that will be carried out by an RAC testing facility. Such facility will be selected and designated as the project's RAC Testing Center. The RAC Testing Center will be established during the first year of the project. Terms of Reference for the designated RAC Testing Center will be developed and a diligent process for the selection of the suitable test facility will be carried out. Moreover, specifications and guidance for the required test procedures and protocols and compliance with pertinent Chinese standards will be developed for, and used by, the designated RAC Testing Center.

Activity 2.8.2: RAC Product Testings

138. This activity involves the conduct of 3 rounds of RAC product performance testing during the first, fourth, and fifth years of the project by the designated RAC Testing Center. Apart from the testing of required quality parameters, the energy performance of the RAC product will be tested. All RAC manufacturers will be required to participate in the product testing and provide test samples to the RAC Testing Center. The testing procedures will be in accordance with Chinese testing procedures and standards¹⁹.

Activity 2.8.3: RAC Product Testing Results Reporting

139. This activity will involve the analysis of the results of the RAC product testings. Each RAC manufacturer will receive a copy of the report on the results of the testing of their product(s) including the analysis of the results, and recommendations for improvement of the product quality and/or energy performance. The RAC Testing Center will collate all the test results data and analysis results, using summary data so as to mask proprietary information for data being published outside the project²⁰. The final data report will include evaluation results on technical assistance impact on RAC product energy performance, and product testing data impact.

¹⁹ The RAC Testing Center will apply the officially recognized testing procedures and protocols for RACs. In this regard, it will coordinate with the China National Institute for Standards, and the China Standards Certification Center, which are involved in the UNDP-GEF BRESL.

²⁰ Project consultants will have full access to data as necessary, but will sign confidentiality agreements to ensure that any confidential data so remains.

GEF support is required to ensure that necessary testing is completed to support other GEF-funded activities, provide information to manufacturers on energy efficiency gains, and monitor and verify project impact.

Output 2.9: Policy Recommendations and Information, Education and Communication Materials on Addressing ODS Refrigerant Replacement and Disposal

140. This output of the project is intended to address the potential negative impacts of the widespread use of EE RACs. Presently used refrigerants in RACs are classified as ozone depleting substances and they have high global warming potentials (GWP). The refrigerants from old RACs which are not recycled can be released into the atmosphere if the disposal is not done properly. This activity is in line with the premise of assisting sustainable development efforts that will bring about positive impacts without causing negative impacts on other aspects of development. It will be coordinated with the on-going activities conducted by GOC agencies like the National Development and Reform Commission on Appliance Recycling, and work done by the GOC for the Montreal Protocol.

Activity 2.9.1: Formulation of Policy Recommendations on Proper ODS Refrigerant Management and Disposal

141. This activity will include the formulation of policy recommendations for managing ODS refrigerants in old RACs. A policy study on the most cost-effective approach for managing the old refrigerants from old RACs will be conducted. Such study will investigate all aspects of the entire waste management process – handling, storage, collection, recycling, and disposal/destruction and treatment of non-recyclables. The study will recommend technically and financially viable schemes of managing and disposal of the ODS refrigerants in old RACs. Based on the results of the policy study, a proposed national policy and set of guidelines for the management and disposal/destruction of the ODS refrigerants will be formulated. Advocacy and lobbying activities aimed towards securing the approval of the policies will be carried out in conjunction with those that will be carried out to deliver Output 3.8 (RAC Energy Efficiency Policy Promotion). The success of this activity will be manifested by the acceptance for consideration by the relevant GOC authorities of the proposed policy recommendations and guidelines.

Activity 2.9.2: Development of Information, Education and Communication Materials on ODS Refrigerant Management and Disposal

142. A guidebook on managing and disposal of ODS containing old RACs and other refrigeration appliances/equipment will be prepared for dissemination to ACC/RAC manufacturers, refrigerant traders and suppliers, central and local government authorities and other interested stakeholders. A special information campaign for promoting the guidebook will be carried out in conjunction with the Consumer Education Program (Output 3.5). As part of this activity, the PEERAC Team will establish collaboration with GOC agencies involved in Montreal Protocol activities in China as well as other like-minded entities in the private sector in developing information, education and communication (IEC) activities on ODS refrigerant handling and disposal. All of these IEC activities will be carried out under the PEERAC's Consumer Education Program.

GEF support is required for the TA in the conduct of the policy study and formulation of policies and guidelines, as well as in the development of IEC materials on the proper handling and disposal of ODS refrigerants from old RACs.

COMPONENT 3: ENERGY EFFICIENT RAC PROMOTION

143. Under this project component, energy efficient RACs will be promoted through a variety of coordinated and complementary measures, including procurement promotion, retail promotion, a recycling/rebate program, national energy efficiency label enhancement, consumer education, web-based information dissemination and promotion, public relations, and policy promotion. These measures will also complement and be coordinated with the training and technology development activities under outputs 1 and 2 (see “Demand-Pull” discussion above for further elucidation of the relationship between activities). For example, the consumer education program will be timed so as to begin when new RACs are hitting the market during the product commercialization activity.
144. Each of the programs under this project component has been designed to offer maximum possible incentives to stakeholders to participate. Programs designed to continue after project completion (e.g., the procurement program) will be housed at, and implemented by, an existing institution with related functions in order to leverage GEF resources and insure sustainability.

Output 3.1: High Efficiency RAC Procurement Guide and Procurement Promotion

145. No standardized informational or promotional materials or programs currently exist to target and encourage group or corporate procurement of EE RACs. To deliver this Output, a procurement guide for energy efficient RACs will be developed and distributed to 100+ organizations to fill this gap. The PMO and procurement promotion subcontractor will also develop and implement a program to promote purchase of energy efficient RACs to organizations, with the target of receiving commitments from 50+ organizations to purchase EE RACs. The procurement promotion program will be housed at an existing institution with related functions in order to leverage GEF resources and insure continuation after project completion. In order to increase program efficiencies, activities will be coordinated with the web dissemination program described below.

Activity 3.1.1: Review of Typical Corporate RAC Procurement Procedures

146. This will entail the evaluation of various practices and policies employed by corporations on the procurement of RACs. A survey will be carried out in various buildings and companies and among the distributors/sellers of RACs on the typical procurement policies and practices employed by organizations that mass procure RACs. The present operations and procedures will be analyzed, and an assessment of potential improvements or modifications to maximize benefits from the purchase and use of EE RACs will be carried out.

Activity 3.1.2: Formulation of RAC Procurement Guidelines

147. Based on the survey conducted and the assessment of potential improvements to maximize benefits from the purchase and use of EE RACs, specific guidelines/procedures, possibly for each type of organization will be prepared. Such guidelines are meant to assist the organizations/corporations to benefit from the purchase and application of EE RAC, especially if these items are bought in bulk. The guidelines will be published and

disseminated to 100+ companies/institutions both in the private and public sectors, with potentially significant purchases of EE RACs.

Activity 3.1.3: Promotion of the Application of the RAC Procurement Guidelines

148. Seminar-workshops will be conducted for the promotion, and for introducing the application, of the RAC Procurement Guidelines. Such seminar-workshops will be carried out in coordination with ongoing programs of the NDRC, MOF, MOFCOM and MIIT on the promotion of appliances to the countryside²¹. The people working on those programs will participate in these seminar-workshops and will then promote the RAC Procurement Guidelines in the provinces where their programs are implemented. This activity will include the design and conduct of said seminar-workshops. The PEERAC PMO and subcontractors will work with targeted organizational purchasers to promote high efficiency RACs, with the goal of obtaining commitments from 50+ organizations promote purchase of EE RACs. Organizations with large purchases of RACs will be encouraged to procure EE products. Organizations that commit to such purchases will be presented with an "Energy Efficiency Appreciation Award" (a plaque) by the project and permitted to advertise that achievement.

Activity 3.1.4: EE RAC Procurement Guidelines Effectiveness Evaluation

149. After completion of the above activities at the end of year 5, the PMO and Subcontractor (with support from the CTA) will evaluate program effectiveness. To the greatest extent possible, usage and user evaluation data will be obtained on an ongoing basis through automated processes. For example, a postcard mailer with user feedback distributed with procurement guide. For information downloaded from the website, usage and impact information would be obtained through provision of an email address when downloading materials, followed 6-12 months after download with a brief (to encourage response) electronic user survey asking if the organization procured EE RACs, and if the procurement guide helped them do so.

GEF support is required to develop and disseminate procurement promotion materials which would otherwise not be extant, and house ongoing procurement promotion activities in an institution that will allow for their sustainable continuation.

Output 3.2: Completed RAC Retailer Program

150. No retail-level programs currently exist in China to promote purchase of energy efficient RACs. As further barriers to sales of EE RACs, dealers are often reluctant to stock and promote EE RACs, salespeople do not receive training in energy efficiency, and are not motivated to steer purchasers to efficient products, nor are other purchase incentives available. Little information is available at retail locations regarding energy efficiency and EE products.
151. The project will address these barriers through retailer education, dissemination of in-store marketing materials, and a retail incentive program. The project will distribute informational and promotional materials to at least 1000 retail locations. At least 50 key retailers will receive training in energy efficiency and energy efficient products. A

²¹ These are the: (1) Home Appliances Going to the Countryside” Program; (2) “Replacement of Household Electrical Appliance” Program; and, (3) Automobile and Home Appliance Replacement” Program

demonstrative retail incentive program will implemented to provide incentive to purchase at least 100,000 high efficiency RACs at a unit cost of \$1/RAC.

152. Due to the importance of company outlets in the RAC market, the project will also work closely with RAC manufacturers to increase efficiency and effectiveness.

Activity 3.2.1: Capacity Needs Assessment of Local RAC Retailers

153. A survey will be conducted to determine and evaluate the current level of capacity of the local RAC retail industry to promote and market EE RACs, including the assistance they would require to promote and market EE RACs. The results of the assessment will be used in designing a training program for them to learn about the benefits, operation and maintenance of EE RACs that they will be retailing to users. The PMO will work with large retail chains and RAC manufacturers (which account for a large share of retail sales through company owned and operated outlets) in carrying out the survey and capacity needs assessment.

Activity 3.2.2: RAC Retailer Training Workshop Design and Implementation

154. This activity will involve the design, preparation, organization of the RAC retailer training program which will take place in the fourth year of the project. It will be on the features and benefits of RACs, operation and maintenance of RACs, and on the RAC marketing techniques. The training materials will be prepared by experts that will be engaged, and will be based on the results of the assessment carried out in Activity 3.2.1. At least 50 retailers will receive training.

Activity 3.2.3: Conduct of In-Store Marketing of EE RAC

155. As part of the retailer training, information and promotional materials about EE RACs will be developed and printed for distribution to RAC retailers. The retailers from large retail chains and RAC manufacturer-operated outlets who participated in the retailer training are expected to lead the promotion of EE RACs to other retailers within their respective groups (retail chains) or companies (RAC manufacturer operated retail outlets). The promotional materials will be distributed to at least 1000 retailers. This activity will take place in the fourth quarter of Year 4.

Activity 3.2.4: Retail Incentive Program Design and Implementation

156. In order to reduce dealer reluctance to stock EE RACs and provide purchasers with an incentive to purchase them, the project will design, develop, sponsor and implement a lottery-based retail sales contest. The contest period will coincide with the timing of the activity on RAC product commercialization (Activities 2.5.1 – 2.5.5), so as to further provide incentive to sales of new EE RAC models and leverage the consumer education program that will also take place at that time. Purchasers of EE RACs during the contest period will be encouraged to submit contest entries, containing their name, contact information, date and location of purchase, receipt number, and model purchased. In order to reduce program administrative costs, it is envisioned that purchasers will be provided with a website to enter information into an online database from which winners will be randomly selected and that 200 prizes of \$500 each (roughly the cost of a new RAC) will be issued (after verification of original receipts or invoices). Research on lottery contests demonstrates that the impact of such an incentive is far greater than average unit cost per incentive: if, as conservatively estimated, incentives are provided to 100,000 EE RACs

through the program; the unit cost will be only \$1/RAC. The impact's psychological value will however be much greater.

157. As a further program benefit, data submitted by purchasers for the contest will act as an independent monitoring mechanism for sales data provided by manufacturers in conjunction with the RAC manufacturer incentive program, since it will allow retail data collected through the sales lottery to be compared with sales data provided by RAC manufacturers.

Activity 3.2.5: Evaluation of the RAC Retailer Program

158. This activity involves the assessment of the effectiveness of the various activities carried out under the RAC Retailer Program and to come up with relevant recommendations for future similar activities after the PEERAC project. The evaluations are expected to provide useful feedback in the design of similar promotional programs in the future.

GEF support is required for the TA necessary for the design of the retailer program and for funding the incremental cost of providing lottery-based incentives to EE RAC purchasers in order to further provide incentive to their selection of energy efficient products.

Output 3.3: RAC Rebate Program Design and Implementation

159. As China's RAC market increasingly moves from a first-purchase to a replacement market (i.e., where households are increasingly buying a new air conditioner as a replacement for one that is being gotten rid of), the problem of used RACs is becoming increasingly serious.
160. While the replacement of an old, inefficient RAC with a new, more efficient one is in and of itself a good thing for energy efficiency and the environment, replacement of old RACs creates one of two problems. If and when the old air conditioner is scrapped, it may be done so in an environmentally unsound manner, creating new solid waste streams, ozone depleting substances (ODS) emissions if refrigerant is released (as it almost always is), and air pollutants (including dioxin, a Persistent Organic Pollutant covered under the Stockholm Convention) if plastics and other materials are disposed of by burning. If however the RAC is resold in the used appliance market (often for resale to lower income or rural households), the inefficient old RAC will then remain in use, becoming an even worse energy hog: in addition to older models' lower initial energy efficiency, industry experts estimate that energy use increases by 5-10% per year for each year over its design life.
161. In either of the above cases, both global and local pollutants are created, and in large enough scope to require a stand-alone project to fully address. While the energy efficiency and global environmental impact of second hand RACs is part of the baseline situation and external to the project (since purchasers of new RACs will get rid of their old ones regardless of whether the new unit is energy efficient or not), the project will nonetheless seek to partially mitigate the trend by promoting, through the rebate scheme, the retirement and environment-friendly recycling of old RACs replaced by new, energy efficient ones.
162. While specific implementing regulations have not yet been developed, China's Circular Economy Promotion Law in principal makes manufacturers responsible for disposal of old products. The project will therefore work with manufacturers to implement the recycling

program in conjunction with the RAC incentive program. The recycling/rebate program (“yi jiu huan xin” in Chinese) will require manufacturers to include a rebate component in their promotion of their new energy efficient products, such that, for example, manufacturers would provide the purchaser of a new RAC with a rebate for trading in their old one. Manufacturers and retail stores already have such promotions, but the old RACs are then resold or unsustainably disposed of, rather than being recycled in a sustainable manner.

163. As a condition of project participation, RAC manufacturers would be required to accept trade-ins and then recycled in a sustainable manner a minimum of 1000 old air conditioners. The manufacturer replacing and recycling the greatest number (with a 5,000 threshold of old air conditioners (either absolute terms or adjusted for relative energy savings, depending on the availability of data) would then receive incentive funding of \$50,000, along with a plaque commemorating their contribution.
164. China has already established five demonstration appliance recycling plants with an investment of RMB 100 million through NDRC’s Appliance Recycling Demonstration Program. These are in Qingdao, Hangzhou, Beijing, Tianjin, and Shanghai. RAC manufacturers will be encouraged to work with these plants, or, if they prefer, permitted to use or establish comparable facilities.
165. Based on a minimum target of 1,500 RACs replaced and recycled per participating manufacturer and 5000 for the incentive recipient, at least 20,000 inefficient RACs will be retired and recycled.

Activity 3.3.1: Conduct of RAC Rebate Program Workshop

166. The PMO will organize and conduct a seminar-workshop during the third year of the project to promote the concept of a RAC rebate program to the RAC manufacturers, retailers, and consumer groups. Old RACs that are received from consumers availing of the rebates for the purchase of EE RACs will be recycled. The seminar-workshop will not only introduce the program and its mechanics, it will also solicit comments and suggestions from the participants regarding the program. Where applicable and feasible, solicited recommendations for strengthening the program will be considered.

Activity 3.3.2: RAC Rebate Program Design

167. The general idea of the program is for RAC manufacturers to develop their respective rebate plans. They will be (if required) assisted by the project in the design of their plan. The RAC rebate plans prepared by the RAC manufacturers will be reviewed by PEERAC experts. Additional support in the form of technical advice, as well as assistance in the coordination with Recycling Centers will be provided (when required). Approved plans will be endorsed by the PEERAC Project Advisory Committee.

Activity 3.3.3: RAC Rebate Program Implementation

168. The RAC manufacturers will implement their endorsed rebate and recycling plans for a one year period beginning at the last quarter of the 4th year of the project implementation. The implementation coincides with the EE RAC commercialization period in order to provide an additional incentive for energy efficient new air conditioners. The RAC manufacturers will report the progress of their respective rebate plan implementation to the PEERAC PMO as per agreed reporting schedule. Among the parameters that have to be

reported are the numbers of inefficient RACs retired, recycled, and replaced with new efficient ones.

Activity 3.3.4: RAC Rebate Program Evaluation and Incentive Award Issuance

169. This activity involves the assessment of the effectiveness of the various rebate plans that were implemented by RAC manufacturers under the RAC Retailer Program. From the implementation reports received by the PEERAC PMO, the RAC manufacturers that have achieved the greatest numbers of recycled and replaced inefficient RACs are determined and given incentive awards (and a plaque of appreciation) at the end of the program. The evaluation is also meant to come up with relevant recommendations for future similar activities after the PEERAC project. The evaluations are expected to provide useful feedback in the design of similar promotional programs in the future.

GEF support is required to initiate RAC manufacturer based recycling activities and jump-start a sustainable recycling program.

Output 3.4: *Enhanced National EE Label for RACs*

170. China currently has an energy efficient labeling program using a category information label, developed with support from the GEF China Refrigerator Project. The label was first developed and used for household refrigerators, but has since been expanded to other products. While the label proved effective for promoting sales of energy efficient refrigerators, it has proved less effective in promoting sales of energy efficient RACs. This relative lack of success is due in part to technical issues related to the RAC label, and in part to the category thresholds. In addition, the label's impact has been reduced by lack of promotion and lack of training support for manufacturers and retailers.
171. The project will address these barriers through modifications in the labeling program, combined with promotion of the label through the project's consumer education program (discussed below) and training in conjunction with the project's manufacturer and retailer training programs (discussed above). The project will work closely with the relevant GOC agencies responsible for appliance energy labeling on the tasks that will be done to deliver this output in order to ensure that activities are coordinated at high levels and full consideration of the national energy labeling objectives. This particular activity will also be coordinated with other related projects in China such as the UNDP-GEF BRESL Project in order to maximize overall impact.

Activity 3.4.1: Review of RAC Labeling System

172. Energy labeling experts of the PEERAC project will review the current energy labeling system for RACs in China. This work will be coordinated with the work on RAC energy labels by the China BRESL Country Team, and will be carried out through consultation meetings. The review report will include the review findings and the pertinent recommendations to improve the entire energy labeling program, or at least some of the components/features.

Activity 3.4.2: Modification of the RAC Energy Labeling Program

173. Based on the recommendations from the review of the current RAC Labeling System, appropriate and feasible modifications will be done. The proposed modifications (on the labeling scheme, the labels, and/or the implementation mechanism) will be presented to the

RAC manufacturers, retailers, consumer groups and the relevant GOC authorities for comments and suggestions. Comments will be addressed and where applicable and feasible, solicited recommendations for strengthening the program will be considered. The revised RAC energy labeling program will be finalized and submitted to the relevant GOC authorities for approval.

Activity 3.4.3: Planning and Promotion of the RAC Energy Labeling Program

174. The implementation plan for the approved RAC energy labeling program will be prepared by the same GOC agency that is overseeing the implementation of the current energy labeling program for RACs. This includes the administrative and logistical requirements, including coordination work with relevant GOC agencies for the program implementation. Moreover, the plan shall include the follow-up actions for the continuous implementation of the program even after the end of the PEERAC Project. Seminars and/or workshops will be conducted at the national and provincial levels for the introduction and promotion of the program to the RAC manufacturers and retailers as well to consumer groups explaining, among others, the mechanics and benefits/merits of the program.

Activity 3.4.4: Implementation of the RAC Energy Labeling Program

175. As per the implementation arrangements spelled out in the program implementation plan, the program will be put into motion together with the partner GOC agencies, including the China BRESL Country Team. The timing of the program implementation shall be such that it will be concurrent and in coordination with activities on consumer education program and information dissemination (Activities 3.5 and 3.6). PEERAC will be partially supporting the program implementation during the fifth year of the project for a period of one year. Thereafter, the GOC agency that has the mandate for the implementation of energy labeling programs shall be in-charge of the program implementation.

Activity 3.4.5: Evaluation of the Modified RAC Energy Labeling Program

176. Based on the results and analyses of the consumer surveys that will be conducted under the Consumer Education Program (Activity 3.5) and from the RAC Information Center reports, the effectiveness and impacts of the modified RAC Energy Labeling Program will be assessed. The targeted result is a 10% increase in consumer awareness of the RAC label, which ultimately translates into increased sale and use of EE RACs. Recommendations from the surveys on possible enhancement of the program implementation and its effectiveness will be taken into account when the program is up for revision.

GEF support is required to provide technical support to standards setting agencies by international and national project experts in order to maximize label program effectiveness.

Output 3.5: Completed Consumer Education Campaign

177. While consumer awareness of household appliance energy efficiency has significantly increased over the last ten years (in part due to the impact of the GEF Refrigerator Project), consumers continue to prioritize other product features over energy efficiency, or do not fully understand the life cycle benefits of purchasing energy efficient products. As with any consumer product, RAC energy efficiency must be promoted in order for consumers to fully value it in purchase decisions. In addition to the consumers, building practitioners

(e.g., architects, engineers, contractors, etc.) that are involved in the design of air conditioning systems in buildings will also be included in the planned consumer education program. For these stakeholders, the advocacy/promotion campaign will include capacity building on the proper application (e.g., sizing and specification, installation) of the RACs to comply with existing building energy codes/standards on air conditioning.

178. In developing and implementing the consumer education program to deliver this Output, the project will draw on the experiences of the China Refrigerator project (the first GEF project to include a significant consumer product advertising component) and the US Energy Star Program. In order to maximize the impact of the GEF resources, the project will focus GEF funds on the development of high quality creative content, which will then be placed through a combination of public service announcements (PSAs) and cooperative manufacturer advertising. In this manner, project organizers anticipate potential leveraging GEF resources in delivering this output by a ratio of more than 10:1.
179. RAC manufacturer commitment to the cooperative advertising program will be a condition of participation in the project, in the form of the requirement that RAC manufacturers allocate no less than 10% of their advertising budgets to energy efficient products. Given that manufacturers already spend significant amounts on advertising, project organizers believe that requiring them to allocate this portion of those funds to EE products is reasonable and achievable. The China Refrigerator Project made use of an identical requirement, which manufacturers were willing and able to commit to and achieve (in fact, they exceeded project requirements). With this cooperative advertising program, project organizers target an increase in consumer awareness and/or importance of energy efficient RAC by 10%.

Activity 3.5.1: Survey on Level of Consumer Awareness about EE RACs

180. A survey will be conducted to determine and evaluate the current level of awareness of the consumers in the commercial and residential sectors about the features and benefits/merits of EE appliances, in general, and EE RACs, in particular. Also from the survey, the expectations of the consumers about EE appliances, particular EE RACs will be ascertained. The results of the survey and the analyses will be used in designing a consumer education program that will help promote the application of EE RACs as well as for them to learn about the benefits, operation and maintenance of EE RACs.

Activity 3.5.2: Development of a Consumer Education Program

181. Based on the results and recommendations of the survey analysis in Activity 3.5.1, the PEERAC PMO, project experts, and a media subcontractor (a leading national or international advertising firm) will design and develop a suitable consumer education program, including the program implementation plan. The PMO will also work with advertising firms that have previous experiences in consumer education program design and implementation. Suggestions (in the form of proposals) can be solicited from such firms. Suitable proposed activities can be integrated into the consumer education plan that the PEERAC experts will prepare. The program will also have a specific module for building practitioners (e.g., architects, engineers, contractors, etc.) that are involved in the design of air conditioning systems in buildings. For these stakeholders, the capacity building will be provided on the proper application (e.g., sizing and specification, installation) of the RACs to comply with existing building energy codes/standards on air conditioning.

182. Furthermore, this activity will also include the design of the consumer education materials based on the information needs of the consumers. Among the subject that will be included in the program is on ozone depleting substances (ODS) as this relates to RACs and also other refrigeration appliances/equipment. This is in line with the move to address Montreal Protocol objectives of eliminating ODS, which the present types of refrigerants used in RACs are included.

Activity 3.5.3: Implementation of the Consumer Education Program

183. The program implementation will be carried out as per the agreed implementation arrangements in cooperation with the partner GOC agencies. The actual training event must be conducted as planned. Any uncontrolled deviation in the plan must not greatly affect the prescribed objectives and schedule of the trainings. Using the monitoring mechanism developed for the program, each consumer education activity shall be evaluated from both perspectives of the participants and the trainers. A report incorporating the results of the evaluation for each activity shall be prepared.

Activity 3.5.4: Implementation of Cooperative Advertising Campaign with Manufacturers

184. As part of the consumer education program, PEERAC will develop and implement a cooperative advertising campaign with RAC manufacturers. This campaign will begin at the end of year 4 and last one year, concurrent and coordinated with the EE RAC commercialization period, the retail incentive contest, the recycling/rebate program, and the labeling promotion activity. This will involve the provision of technical assistance to RAC manufacturers in the design of their marketing advertisements for the EE RAC products. The dollar value of EE RAC advertising to be placed by manufacturers is estimated at US\$ 7.5 million, yielding a co-funding ratio of more than 10:1 for this activity. During the advertising campaign, the media subcontractor that will be engaged by the project will work together with the National and International Media Experts in tracking and reporting on the RAC advertising by manufacturers for EE RACs.

Activity 3.5.5: Evaluation of the Consumer Education Program

185. This activity will include analysis and assessment of the entire consumer education program (inclusive of the advertising campaign) based on the results of evaluation of each consumer training activity conducted under the program. Part of this activity is the conduct a survey to determine end-of-project consumer awareness about EE RACs, its economics and benefits/merits. Also included in the analysis are the reports prepared by the media sub-contractor on the advertising carried out by manufacturers on their EE RAC products. The results of the assessment of the training reports, consumer awareness level survey, and the reports on the advertising campaigns of the RAC manufacturers, as well as the recommendations provided in these reports shall be presented to all stakeholders of the program for their review and approval.

Activity 3.5.6: Development of a Sustainable Continuing Education Program

186. This activity involves the development of a sustainable continuing education program for the consumers. Focus is given on the institutionalization of the said program under the purview of the relevant GOC agency, or by the CHEAA. Thus, a sustainable follow-up program shall be developed to ascertain the continuing consumer education after the 5-year implementation of the project. Lessons identified from the evaluation of the various training activities under the Project shall be the bases in identifying new strategies to

ensure effective implementation of consumer education. Institutional framework for the implementation of the follow-up program shall be developed. This involves the delineation of roles and responsibilities of different agencies and institutions shall also be outlined. Corresponding work plan of activities, financial requirements and fund sourcing activities for the follow-up program shall also be developed.

GEF support is required for the TA in the development and implementation of the consumer education program and for developing high quality energy efficient RAC promotional materials for cooperative use by RAC manufacturers in their advertising campaigns and for placement through public service advertising.

Output 3.6: Web-based Tools on EE RACs

187. Consumers in China lack readily available information on energy efficient RACs, and there are no Chinese language web-based tools to promote purchase of EE RACs. As a complement to the consumer education campaign, a web-based system for dissemination of informational and promotional materials on energy efficiency and energy efficient RACs will be developed. The web-based system will be housed at an existing institution with related functions in order to leverage GEF resources and insure continuation after project completion.
188. The system will consist of a multi-media website developed and launched during the first year of the project, with informational/promotional materials (audio-visual materials, brochures, technical reports, articles, etc.) disseminated and web-based tools developed to promote EE RAC purchase. The website will target 350,000 hits during the project period, with at least a 50% user favorability rating. RAC manufacturers and other stakeholders will be encouraged to link to website for cross-promotion.

Activity 3.6.1: Website Design, Implementation and Maintenance

189. The website will be capable to provide various information and promotional services that the PEERAC which include, among others, the access to the database within the Air-conditioning Market Information System (AMIS) (Activities 1.6.2 and 2.7.2), and possibly other information providers. It will be user-friendly and able to meet minimum hardware and software requirements. Link with relevant databases in the country and possibly in other countries will be part of the web page design, both in English and Chinese languages. The design should be accessible to the project stakeholders for review.
190. The design of the website shall involve preparation of its functional requirements, development of specifications for both software and hardware requirements as well as the formulation of maintenance requirements for the system. It will be made compatible to popular internet platforms. The website shall then be implemented and documented following good programming styles and practices. A maintenance plan based on the agreed maintenance requirements of the website shall be developed to expected changes on the needs and demands of the target end-users, to update the contents of the web pages, ensure proper operation of the site and its protection from any form of corruption.
191. A set of capacity building activities on the management and maintenance of the website shall be conducted. This covers the conduct of end-users' trainings, website maintenance, and a development of users' feedback mechanisms for the improvement of the website, etc. Projected budgetary requirements for the sustainability of the website shall also be determined vis-à-vis continuance of the website services after the PEERAC project.

Activity 3.6.2: Development of Web-based Tools

192. Based on the results of the surveys that will be conducted to assess the technical capacity needs of the AAC and RAC industries, RAC market and consumer groups, web-based tools will be developed for use by these stakeholders. This activity will involve the design and development of web-based tools like an energy savings calculator that will be used as a tool and guide by both RAC users and air conditioning system designers and installers for easy comparison and better appreciation of the benefits of EE RACs. Use and application of such tools will be demonstrated and promoted through the Consumer Education Program for RAC users in the commercial and residential sectors and during the conduct of technical assistance activities. The target number of users of the web-based tools is 100,000 during entire project period.

Activity 3.6.3: Promotion and Launching of the Website

193. The completed website design will be promoted by the PMO to the project stakeholders, as well as other potential users. The designated entity that will administer the website shall facilitate the promotional activities in consultation with and cooperation of other entities that support the database, e.g., the AMIS and the ACC and RAC Testing Centers. The website development will be completed by the website subcontractor during the first year of the project. It will be launched through a workshop at the end of the first year of the project (concurrent with the beginning of the consumer education campaign). The workshop activities will include demonstration of the use of the website and the web-based tools. There will also be presentations of the different types of information that can be obtained from it, as well as the databases that can be accessed through it.

Activity 3.6.4: Evaluation of the Website Performance

194. After the completion of the first year of website operation, the website performance will be evaluated. This activity will include analysis and assessment of the website and its components (modules) based on user surveys that will be conducted to determine user satisfaction levels, and its overall usefulness and effectiveness in promoting the use of EE RACs. Comments and suggestions from the website users will be considered in future upgrading or enhancement.

GEF support is required to provide TA in the development of web-based tools and for the provision of expert support to develop, launch and maintain the website, as well as to develop promotional and informational materials.

Output 3.7: Completed EE RAC Public Relations Campaign

195. A public relations campaign will be held concurrently with the consumer education campaign in order to provide longer term and higher level impact on consumers. Materials developed through the public relations (PR) campaign will also be disseminated through the website (discussed above) and to policy makers (see discussion of policy program below). A subcontractor with PR expertise will be selected to manage the program, develop materials, and ensure material placement. Key government agency project sponsorship and inclusion in the project advisory committee will further enhance media placement ability. A target number of 60 articles will be published under the program. In addition, a project press conference will be hosted.

Activity 3.7.1: Preparation and Publication of Articles on EE RAC

196. Articles on EE RAC (design, manufacturing, marketing, operation and maintenance, etc.), as well as on the energy efficient design and energy conserving operation of air conditioning systems employing RACs will be prepared and published for dissemination. These articles will be produced through various means, whichever are deemed most practical and cost-effective as per expert advice. It could be through: (a) Call for technical papers for a conference on EE RAC Technology; (b) School writing contest to come up with human interest aspects of EE RAC applications; (c) Commissioning air conditioning experts to write technical papers for example on the climate change impacts of the air conditioning industry or the widespread use of air conditioning; or, (d) Solicitation of prepared and unpublished articles related to the RAC industry or EE RAC applications.
197. An editorial team will be formed to come up with the publication plan, which will be for a one year period coinciding with a year-long PR campaign for EE RACs. The team is tasked to review and edit the papers/articles received, and prepare the selected articles for publication. A target number of 60 articles will be published.

Activity 3.7.2: Presentation of PR Campaign Achievements

198. The PMO will consolidate all the completed deliverables from the activities that were carried out under the public relations (PR) campaign into one synthesis report that will be presented to the stakeholders during a workshop towards the end of the project. The synthesis report will include the impacts of the other PR-related activities of the project such as the consumer education program and the publication and dissemination of articles on EE RAC. During that workshop, a press conference will be held to report on the achievement of the PR campaign for the promotion of EE RACs.

GEF support is required for the preparation of promotional articles on EE RAC, for the design and implementation of public relations activities promoting EE RACs and to support the costs of the project press conference.

Output 3.8: RAC Energy Efficiency Policy Promotion

199. A variety of agencies have overlapping responsibilities in several areas related to the project. Given their other responsibilities, these policy makers are often not aware of and/or do not prioritize RAC energy efficiency. In order to overcome this barrier, the project includes a series of formal and informal meetings with policy makers in order to familiarize them with the project and (where necessary) with energy efficiency issues, consult on project issues, obtain necessary approvals, and gain support for policy initiatives.

Activity 3.8.1: Conduct of EE Air Conditioning Policy Studies

200. This activity involves the provision of technical advice in the review of existing EE-related policies and regulations in China as applied to the design, application and operation of air conditioning systems in buildings. Similar policies found in other countries, especially those with the same climatic conditions (especially in warm winter and hot summer zones), that are aimed at promoting EE air conditioning in buildings will also be reviewed. It will also involve the evaluation of possible policy support activities and strategies that can be considered for building developers/investors, managers and owners who would like to use EE air conditioning systems. Specific policy studies will be carried out based on the

suggestions of the project stakeholders as well as the recommendations from the policy reviews with the objective of determining possible improvements that can be applied to the existing policies and regulations.

Activity 3.8.2: Organization and Conduct of EE Air Conditioning Policy Workshop

201. The PMO and policy experts that will be engaged by the project will design and organize an EE Air Conditioning policy workshop to solicit inputs for the improvement of the existing policies and implementation guidelines to make them more supportive to the promotion of the widespread use of EE air conditioning equipment (like EE RACs) and systems. Selected key policymakers from the relevant GOC agencies with mandates in the areas of energy efficiency and equipment/appliance quality and trade, as well as consumer groups will be invited to participate in the workshops. Apart from the documentation of the workshop proceedings, the PMO and policy experts will prepare informational materials based on the deliberations during the workshop for distribution to a targeted 100 policy makers beginning in the second year of the project.
202. In addition to the policy issues that will be covered in the workshop discussions are those on the proper management and disposal of ODS refrigerants from old RACs that will be replaced by EE RACs.

Activity 3.8.3: Conduct of an International Policy Exchange

In line with the need to learn from the experiences of other countries in the formulation and enforcement of EE policies, in general, and EE policies in air conditioning systems, in particular, an international study tour will be organized and conducted for policy makers. This study tour is aimed at exchanging EE policy development and implementation experiences with other countries, and for the policy makers to learn actual applications of EE policies specific to the production, marketing and use of EE air conditioning in the commercial and residential sectors of other countries.

Activity 3.8.4: Conduct of an International ODS Workshop

203. To learn from the experiences of other countries in the formulation, enforcement and application of policies and implementation guidelines on the issue of ODS, the PEERAC PMO and policy experts will design and organize an international workshop in Beijing on the management of ODS refrigerants. This workshop will take place during the third year of the project. The workshop will cover experiences and policies on addressing the issue of ODS refrigerant management and disposal. Five key policy makers of GOC agencies with mandates in the areas of equipment/appliance quality and trade will be hosted for this workshop. Also in attendance will be policy experts from other countries who will serve as resource persons, as well as representative of consumer groups.

Activity 3.8.5: Conduct of Targeted Policy Coordination Meetings

204. This involves the organization and conduct by the PEERAC PMO and policy experts of a series of informal meetings with the policy makers in order to familiarize them with the PEERAC project and in particular the aim of removing policy-related barriers to the widespread application of EE air conditioning equipment and systems in the commercial and residential sectors of the country. Moreover, formulated policies on the proper management and disposal of ODS refrigerants will also be included in these advocacy/lobbying informal meetings. These discussion meetings are primarily aimed at

getting the endorsement and approval of the proposed policies that will be formulated in Activity 3.8.4. Where necessary, discussions can be on the energy efficiency aspects of RAC manufacturing and application; and the benefits of improving the export market for locally made RACs. Other objectives of the formal/informal discussion could be clarification of issues on the country policies on energy efficiency as applied to air conditioning systems; requirements that are to be complied with to obtain necessary approvals, and gain support for EE policy initiatives. It is expected that through these series of advocacy and lobbying initiatives, the policy/regulatory-related barriers to the widespread use of EE RACs would be removed, as manifested by the acceptance for consideration of the proposed policy recommendations and improvements, including those on ODS refrigerant management and disposal.

GEF support is needed both for the cost of the formal and informal meetings, including technical assistance for any studies that will be conducted to back up policymakers in supporting the proposed policies.

Project Indicators, Risks and Assumptions

205. The project success indicators are shown in the Project Planning Matrix (PPM) in Section II, Part II. These form part of the parameters that will be monitored during the course of the PEERAC implementation. The target values for these indicators, based on the PPM, are summarized in Section IV, Part VI.
206. During the project development stage, all possible major implementation issues were identified and suitable mitigation measures were proposed. As to the possible risk of project complexity, as a comprehensive market transformation project, the project would require coordination of many different activities in order to effectively implement the agreed activities/interventions and maximize project impact. Experiences from the completed UNDP-GEF China Energy Efficient Refrigerator Project were made use of in the project design in order to minimize potential project implementation risks. The project management system and tools developed and adopted during implementation of that previous project will be used in tracking and managing timely delivery of key milestones and outputs of project activities.
207. While all possible efforts have been made to ensure the effective design and implementation of the project activities in the project design phase, there are inevitably some unavoidable residual risks that will have to be carefully monitored and managed during the project to ensure its success. The different risks that were identified during the project formulation and the recommended mitigation measures and a commentary on the need for mitigation measures are provided in detail in Section IV, Part V.

Expected Global, National and Local Benefits (Details Contained in Section IV, Part V)

Global Benefits

208. PEERAC is projected to bring about a cumulative reduction of GHG emissions from China's C&R sectors of about 35.4 Mtons of CO₂ by end-of-project (EOP). This is realized from the cumulative energy savings till EOP of about 579.2 Mtce (1,440.7 GWh). The cumulative EOP energy savings is from the utilization of new RACs whose market share would have increased by 15%, and whose average efficiency (in terms of EER) is expected to increase cumulatively by 10% (from EER = 2.67 to EER = 2.94).

National Benefits

209. One of the main benefits of the PEERAC project is the demonstration of the win/win nature of energy efficiency investments to manufacturers, dealers and consumers so as to ensure private sector sustainability of the project approach beyond the period of GEF support. This will in turn build a good basis for the Government's continued support of its energy efficiency policy.
210. Capacity development of local technical skills in the ACC/RAC industry is one of the major components of the project. A large group of national experts, ACC/RAC technical personnel, as well as the Chinese RAC market, will be trained. This will ensure that the process started with this project will be sustained and disseminated in the country.
211. The outcomes of the project will contribute to the achievement of the poverty alleviation objective of the country (and UNDP), mostly indirectly. By reducing the growth in the demand for electricity as a result of the efficient use of energy in RAC operations, the release public funds that otherwise would have been invested in additional electricity generation capacity can be invested into socio-economic and poverty alleviation projects.
212. The residential sector (urban and rural) benefits indirectly and in the long-term from high-quality air condition at a lower energy cost and from reduced local pollution and adverse health impacts of increased fossil fuel-based power generation.

Country Ownership: Country Eligibility and Country Drivenness

213. China ratified the UNFCCC on 5 January 1993. It has completed and submitted its First National Communications under the framework of the UNFCCC, which highlighted that EC&EE, in general, and ES&L, in particular and among the measures each country are considering for the reduction of GHG emissions. It is now preparing its Second National Communications to the UNFCCC.
214. The Ministry of Environment Protection (MEP), a central government ministry in China is the national executing agency of the proposed PEERAC project. The Ministry is the nation's environmental protection agency charged with the task of protecting the country's air, water, and land from pollution and contamination. It is empowered and required by law to implement environmental policies and enforce environmental laws and regulations. Complementing its regulatory role, it funds and organizes research and development in the area of environment protection, among which are industrial energy efficiency (combustion), and solid and hazardous waste management. It is also involved in work on alternatives to ozone depleting substances in line with the objectives of the Montreal Protocol.
215. Stakeholders' consultations have been held in conjunction with the LFA exercise and in order to obtain key manufacturer and other stakeholder input regarding project-related issues, concerns, and barriers regarding development, commercialization, and marketing of energy efficient air conditioners. This exercise was the basis for the activities proposed to be carried out under the PEERAC, including project implementation and management arrangements.
216. PEERAC includes ongoing and planned EE RAC manufacturing and application projects of selected project partners in the GOC, such as NDRC and in the private sector, particularly CHEAA and the local ACC and RAC manufacturers. Some of the ongoing and

planned R&D and technical improvement activities of these entities (e.g., EE RAC prototype design, EE RAC promotion), shall be subsumed in the PEERAC.

Sustainability

217. Sustainability is an integral element of the PEERAC activities and is ensured through the outputs of most of the project components. The sustainability of the institutional elements of the project will be ensured through the adoption of collaborative approaches and strategies that seek to foster and reinforce the long-term sustainability of existing institutional and coordination structures that have been established and are operational at both the national and provincial levels with regards to projects dealing with commercial and residential sector energy efficiency.
218. Sustainability of the project is ensured through the outputs of the different project components, e.g., endorsed policies on the utilization of EE RACs and on the proper management and disposal of ODS refrigerants; the Air-Conditioning Market Information System (AMIS); the incentive programs, etc. These are designed to be continuously be carried out even after the PEERAC Project. To ensure this, a follow-up national program will be designed considering the different achievements and lessons learned. The follow-up program, with a long-term target that is to be achieved in the subsequent China development plans, will create a significant impact to the energy performance of the Chinese C&R sectors.

Replicability

219. PEERAC is designed to have a balanced mix of capacity building and enabling environment activities tailor-made to China's specific conditions, markets and regulatory environment. Such balanced mix of activities is expected to promote EE RAC manufacturing and EE RAC applications. Replication is an integral component of the project design as the expected energy savings from the application of EE RAC manufacturing and applications in China (and the corresponding GHG emissions reduction from the reduced energy demand) rely on the replication of the relevant PEERAC activities.
220. Replicability of the proposed project components will be ensured through the documentation of the package of activities/inputs that went into each energy efficiency projects that are in one way or another, directly or indirectly influenced by PEERAC.

PART III: Management Arrangements

221. Given the past experience with UNDP-supported project, UNDP seeks to implement an innovative management approach based on a partnership where accountability and responsibility for managing and achieving project outputs are equally shared among the PEERAC partners. This approach is intended to minimize overall management and overhead costs, while ensuring effective implementation of the project. The organizational structure is shown in Fig. 4.

Project Implementation Arrangements

222. The management structure of the PEERAC project will be as follows: A Project Advisory Committee (PAC) will be established and will comprise of the representatives of UNDP-China, MEP, and also including representatives from the main stakeholders in the

government and relevant industry associations (e.g., CHEAA representing the ACC & RAC manufacturers). Aside from its advisory role, the PAC members shall be required to participate in the annual project review meetings. The Chairperson of the PAC will be the National Project Director. The Project Management Office (PMO) that will be established will be responsible for coordinating and implementing the project activities of the project. The PMO Director will serve as the Secretary of the PAC. PEERAC will be Nationally-Executed (NEX) by the Chinese Government. It will assume the overall responsibility of ensuring that all activities are executed accordingly and as per the approved Project Document. The Ministry of Environment Protection (MEP) will be the UNDP's Implementing Partner for the PEERAC project. On behalf of the MEP, the Foreign Economic Cooperation Office (FECO) of the MEP is designated as the project executing agency.

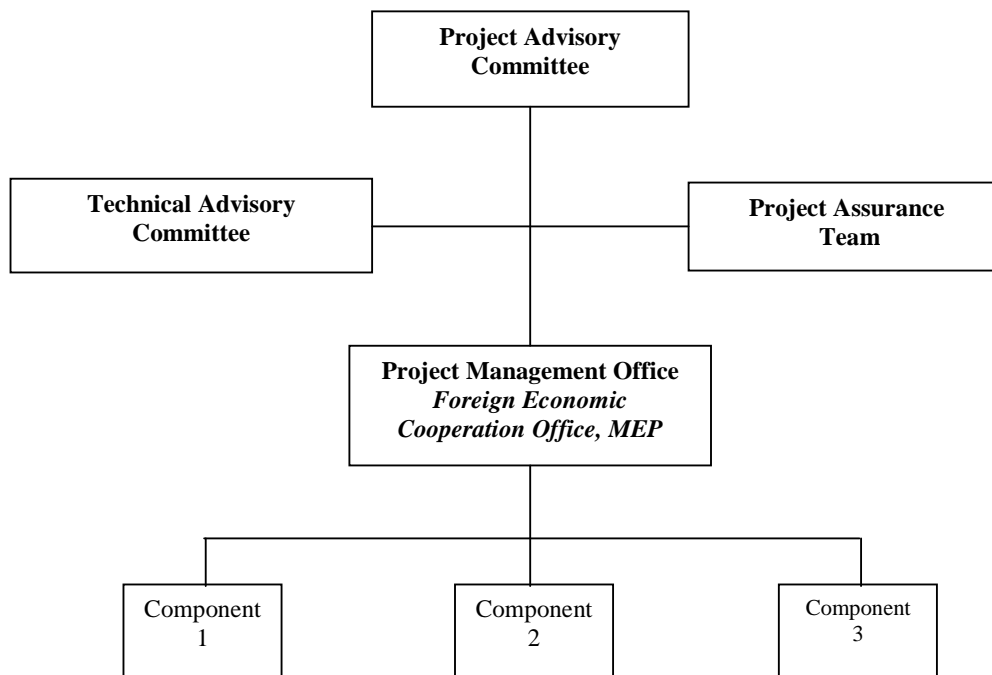


Fig. 4: PEERAC Project Organizational Structure

223. The PAC will be established with the key responsibilities as follow: (a). Reviewing of annual progress reports for necessary guidance; (b) Reviewing and approving any proposed changes in project activities; (c) Providing guidance on the effectiveness of PEERAC implementation, and its linkages to corporate UNDP policy decisions, and other UNDP initiatives; and, (d) Monitoring and evaluating the implementation of PEERAC towards the intended outputs, after two years of project execution. As a minimum, the PAC will meet at least once a year, allowing for the stakeholders to review the progress with the project implementation and to agree on a coordinated annual project implementation strategy and plan. It will play a key role in disseminating programme outputs and recommendations by providing access to high level policy makers and other relevant bodies. Lastly, it will assist in facilitating overall project implementation.
224. The UNDP CO together with the UNDP/GEF Regional Technical Advisor for Climate Change in the Asia-Pacific region will carry out the GEF oversight as well as the UN MDGs achievement for this project. Working in conjunction with the various project

partners, the UNDP CO will be responsible for coordination with FECO and other related stakeholders, to ensure smooth project implementation and transparent financial procedure. It is also responsible for conducting monitoring and evaluation (M&E) activities including Annual Working Plan (AWP), Annual Project Review (APR), Quarter Operation Report (QOR), Project Implementing Report (PIR), Mid-term Evaluation Report, Terminal Evaluation Report, M&E field visits etc, ensuring the delivery of project outputs and achievement of expected project outcomes. The UNDP CO will also provide country office support for all the activities of the project as agreed with the Implementation Partner. UNDP/GEF RCU will provide technical support to ensure the implementation of the GEF approved project activities, adaptive management, and be responsible for the project implementation review to GEF.

225. As the Implementing Partner for this project, China's MEP will appoint a National Project Director (NPD) to be in charge of overall responsibilities, including planning, coordination, administration and financial management of the project with support by the UNDP-CO. The NPD will be responsible for the achievement of the project objectives, for all projects' reporting, including the submission of Annual Work Plans (AWP) and financial reports. He/She will ensure the delivery of the project outputs and the judicious use of the project resources. This will ensure that expected outputs are delivered using the most efficient and cost-effective implementation strategies and procedures. The NPD will be the chair of the PAC.
226. As the Designated Implementing Partner for this project, FECO will take responsibility of supporting MEP and UNDP CO in managing and implementing the PEERAC. FECO is responsible for the organization and implementation of the project activities and for the setting up of a project management office (PMO) that will be responsible for daily project management. FECO will procure services, consultants and equipment according to the annual and quarterly work plans and in line with the National Execution Manual for UNDP projects in China. FECO will also provide the overall guidance and approval of all operational activities and will report to the Implementing Partner and UNDP CO on achievement of project results.
227. A Project Management Office (PMO) will be established by FECO. It will be responsible for the day-to-day management of all the project activities including those on capacity building, technical assistance, and dissemination of results of the project activities. Among its tasks include preparation of annual work plans, procuring inputs, preparing project monitoring reports, daily coordination and general project communications. The PMO, which will be managed by the NPM, will be supported by 2 staff members (Technical Officer and Administrative Officer). At the same time, the NPD will provide guidance to the National Project Manager (NPM), who will be managing the PMO operations.
228. A Technical Advisory Committee (TAC) will be established with the main responsibility of providing the necessary expert advice in the implementation of the technical aspects of the implementation of the various project components. The NTA will be responsible for organizing and coordinating the TAC work.
229. A Project Assurance Team (PAT) will be set up consisting of representatives from the UNDP CO and the RCU. Its main responsibility is to monitor the implementation process, to ensure that the budget allocations are in line with the agreed AWP, the agreed outcomes stated in the project document are achieved, and that there is proper accountability of the GEF grant. The PAT will periodically review the implementation performance and accomplishments of the project activities. It will also call for meetings with the PMO to

discuss the project progress, address potential risks and agree on possible solutions. It will also be called upon periodically to contribute inputs to PEERAC related initiatives and provide necessary recommendations to the PAC.

230. National government professionals and other relevant national stakeholders from the private sector and civil society will, to the extent possible, be engaged in the management, coordination and/or implementation of the PEERAC activities.

231. Audit Clause:

Audits will be conducted following UNDP Financial Regulations and Rules and related audit policies.

PEERAC Implementation

232. The proposed PEERAC will be implemented for a period of five years. Considering the duration of the process of obtaining GEF funding, it is anticipated that the project will kick-off by the first quarter of 2010 and will conclude by mid-2015.

233. To accord proper acknowledgement to GEF for providing funding, a GEF logo will appear on all relevant publications and documents produced by the project, including among others, project hardware purchased with GEF funds. Any citation from any of the PEERAC publications and documents will also accord proper acknowledgment to GEF. The UNDP logo should be more prominent and separated from the GEF logo if possible, as UN visibility is important for security purposes.

PART IV: Monitoring and Evaluation Plan and Budget

234. Project monitoring, evaluation and dissemination will be undertaken in accordance with UNDP and GEF established procedures. The executing agency will be required to prepare Quarterly Progress Reports (QPR), Annual Project Review (APR) and Project Implementation Review (PIR) reports to UNDP. The QPR will provide the summary of the project results, progress and variances from the original plan, implementation issues, and steps being taken to address these issues, and work plans for the next quarters for review and endorsement.

235. Quarterly work plans will be prepared based on the overall project objectives and performance indicators, which will be used to measure performance. The quarterly work plan will be prepared by the PMO and submitted to the Executing Agency and the UNDP-CO. It will be presented, evaluated and adjusted as and when necessary.

236. The APR and PIR reports will provide a more in-depth summary of work-in-progress, measuring performance against both implementation and impact indicators. Any adjustments in project approach will be reported to the Project Advisory Committee who will evaluate and approve the adjustments recommended.

237. The project is subject to two in-depth independent reviews. One will be conducted in the mid-term (first quarter of the third year) and the other will be scheduled upon project termination. A terminal report would be completed prior to the completion of the project and would detail project achievements and lessons learned. Additional independent evaluation may be conducted if UNDP and the GEF deem it necessary.

238. As designated executing agency on behalf of the MEP, FECO will carry out continuous self-monitoring of the project implementation performance. The Project Planning matrix (PPM or Log Frame) in Section II, Part II states all the success indicators and means of verification for each activity that will be carried out under this project. These indicators are the parameters that will be monitored by FECO under this project.
239. To ensure coherent, coordinated and timely implementation of project activities, appropriate practical mechanisms, monitoring and evaluation (M&E) procedures and implementation arrangements will be developed between and among UNDP, FECO, central government agencies, private sector partners (ACC & RAC manufacturers, retailers) and consumer groups. Specifically, an M&E plan for the PEERAC implementation will be developed together with the key stakeholders, and this plan will be based on the identified success indicators and means of verification for the project goal, project purpose, project outcomes, and project activities. The PAC will advise and approve this M&E plan.
240. Surveys will be conducted during the project to track these and other indicators of project impact. Monitoring and Evaluation (M&E) activities will be undertaken to best international practice standards with reference to the International Monitoring and Verification Protocol (IPMVP) methodology. This reference to established international best practice IPMVP methodologies will be a vital element in the presentation of the results of the overall PEERAC to the full range of project stakeholders, including but not limited to GEF.
241. Success indicators for each objective and activity in the PPM will be monitored and evaluated during the course of project implementation. Section IV, Part VI provides the annual targets and the monitoring plan. The extent by which the GEF developmental goal is achieved will be evaluated from the monitored results. Annual target values for the indicators will be confirmed during project document finalization.
242. The project will coordinate with all the project partners. The continuous monitoring and evaluation of all project activities, even after completion of the project period, will bring sustainability of the project with desired benefits in the long run. All evaluation reports will be uploaded to the project website for widespread dissemination. A formal Monitoring and Evaluation Strategy will be developed and implemented in the full-scale project to track the activities and contributions of the activities by all the project partners, in terms of both in-cash and in-kind contributions as detailed in the attached letters of commitment. These M&E findings will be reported on in the project's two in-depth independent reviews.

Project Inception

243. Within 3 months of project signature, an Inception Workshop will be conducted with the full project team, relevant government counterparts, the private sector partners (ACC & RAC manufacturers), the UNDP CO and representation from the UNDP-GEF RCU (Asia-Pacific).
244. A fundamental objective of the Inception Workshop is to make the project team understand and take ownership of the project, review the PPM (indicators, means of verification, assumptions), imparting additional detail as needed and making the indicators more precise and measurable, as well as finalize preparation of the first annual work plan on the basis of the PPM.
245. During the Inception Workshop, the following will be carried out: (i) Review the process of project formulation and the major components of the project; (ii) Introduction of the UNDP

NEX manual and the applicable policies and procedures of FECO management; (iii) Discussion on potential implementation issues with the view of reaching a consensus on the resolution or plan of action to resolve, the issues; (iv) Introduction of the project activities and the confirmation of the distribution of responsibilities among the project actors/stakeholders; (v) Discussions on the finalization of the first AWP; (vi) Fine tuning and confirmation of the success indicators for each project outcome and output; (vii) Finalization of the project annual targets; (viii) Finalization of the terms of reference for each key project management positions, consultancies and sub-contracts; and, (ix) Conduct of a media event to announce the formal launching of the PEERAC Project.

246. The Inception Workshop will also provide an opportunity for all parties/stakeholders to understand their roles, functions, and responsibilities, including reporting and communication lines, and conflict resolution mechanisms. The Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

M&E Reporting

247. Quarterly reporting will be made at the end of each quarter. Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform. Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical). Based on the information recorded in ATLAS, a Project Progress Reports (PPR) can be generated in the Executive Snapshot. Other ATLAS logs can be used to monitor issues, lessons learned etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

248. Annual Reporting to the GEF will be made available end of June every year. Project Implementation Review (PIR) report is prepared to monitor yearly progress made from 1 July of the previous year to the 30 June of the current year. It shall be prepared by the Project Manager and shared with the PAC. The PIR report shall highlight risks and challenges, the summary of results achieved, and lessons learnt of the project for that reporting year. The PIR report combines both UNDP and GEF reporting requirements that includes, but are not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports
- Risk and adaptive management
- ATLAS QPR
- Portfolio level indicators (i.e., GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

249. The APR is a UNDP requirement and part of UNDP CO central oversight, monitoring and project management. It is a self-assessment report by project management to the CO and provides inputs to the CO reporting process and the Results-oriented Annual Report (ROAR), as well as forming a key input to the PAC Review. An APR will be prepared on

an annual basis prior to the Terminal PAC Review, to reflect progress achieved in meeting the AWP and assess performance of the project in contributing to intended outcomes through outputs. The contents of the APR report include but not limited to the following:

- An analysis of project performance over the reporting period, including outputs produced and, where possible, information on the status of the outcome
 - The constraints experienced in the progress towards results and the reasons for these
 - The major constraints to achievement of results
 - AWP, FACE and CDR (ERP generated)
 - Best Practices and Lessons learned
 - Clear recommendations for future orientation in addressing key problems in lack of progress
 - Identification on the potential risks for future implementation
250. The UNDP CO and the UNDP-GEF RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the PAC may also join these visits. A Field Visit Report will be prepared by the CO and UNDP-GEF RCU and will be circulated no less than one month after the visit to the project team and PAC members.
251. The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation. The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the UNDP-GEF RCU. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC).
252. An independent Final Evaluation (or Terminal Evaluation) will take place three (3) months prior to the final PAC meeting and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the UNDP-GEF RCU. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC). Similarly, the relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.
253. During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

254. Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Finally, there shall be a two-way flow of information between this project and other projects of a similar focus.

Financial Monitoring and Quality Assurance

255. The Combined Delivery Report (CDR) is the report that reflects the total expenditures and actual obligations (recorded in ATLAS) of a Project during a period. This report is prepared by UNDP using ATLAS and shared with the implementing partner on a needs basis and at the end of each year. The Implementing Partner is required to verify each transaction made and sign the yearly issued CDR report. Statements of cash position as well as assets and equipments should also be submitted together with the CDR on a yearly basis.

256. Audit is an integral part of sound financial and administrative management, and of the UNDP accountability framework. The project will be audited at least once in its lifetime and in accordance with the threshold established for the annual expenditures by the Office of Audit and Investigations (OAI). The audit provides UNDP with assurance that resources are used to achieve the results described and that UNDP resources are adequately safeguarded. The selection of an Audit Firm shall be through a competitive Request for Proposals, in consultation with the Implementing Partner or if possible shall be performed by the National Audit Authority. UNDP procedures must be followed as per the specific Terms of Reference for Audits of NEX/NIM Projects. The audit is expected to provide assurance related to the following broad areas:

- Project progress and rate of delivery (PP)
- Financial management (FM)
- Procurement of goods and /or services (PR)
- Human resource selection and administration (HR)
- Management and use of equipment and inventory (EQ)
- Record-keeping systems and controls (R)
- Management structure (MS)
- Auditors' comments on the implementation status of prior year audit

PART V: PARTNERSHIPS STRATEGY

257. The successful implementation of PEERAC will depend on the development of effective partnerships between numerous different agencies at multiple levels. Partnerships will be pursued with international and national agencies, as well as international partners to enrich and further project aims. The project will form a partnership strategy with three elements: (a) international coordinating and implementation function; (b) national coordination and implementation function; and, (c) Technical and commercial function.

Key Partners

258. The key partners in the project are described in Sec. IV, Part II of this project document. The PMO will work together with these partners particularly those that will be involved directly in the implementation of activities; those that will implement in parallel PEERAC

activities that they are financing themselves; and those that will help in the coordination of the activity implementations. The PMO will implement the following activities to ensure that the project work is synergized with on-going national activities, as well as to benefit from the expertise available in the region:

- Strengthen its links and established partnerships with key EE projects in the country and in the Asian region. These will include the GOC-sponsored EE appliance promotion programs such as those implemented by NDRC, MOC and MOF. The PMO will also coordinate with NDRC/ERI on the EE standards/labels work under the UNDP-GEF EUEEP, and with NDRC/CNIS/CSC on the national EES&L activities and regional EES&L harmonization activities under the UNDP-GEF BRESL Project.
- Partner with the GOC agencies involved in Montreal Protocol activities in China as well as other like-minded entities in the private sector in developing information, education and communication (IEC) activities on ODS refrigerant handling and disposal.

PART VI: Legal Context

259. This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of China and the United Nations Development Programme, signed by the parties on 29 June 1979. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

260. UNDP acts in this Project as Implementing Agency of the Global Environment Facility (GEF), and all rights and privileges pertaining to UNDP as per the terms of the SBAA shall be extended mutatis mutandis to GEF.

261. The UNDP Resident Representative in China is authorized to affect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

- Revision of, or addition to, any of the annexes to the Project Document;
- Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
- Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and,
- Inclusion of additional annexes and attachments only as set out here in this Project Document

SECTION II: STRATEGIC RESULTS FRAMEWORK AND GEF INCREMENT

PART I: Incremental Cost Analysis

Broad Development Goals

1. In 2007, China consumed 265,480 million tons of coal equivalents (Mtce) of energy and in the process generated 6,300 million tons (Mtons) of energy-use related CO₂ emissions. From 2000 to 2007, the average annual energy consumption growth rate was 9.8%. Since 2004, the electricity demand in the country has been increasing annually by 11%, and it has been apparent that the supply of coal and oil would not be enough to meet the growing demand for energy.
2. In response to the energy issue, and in conjunction with the country's aim to reduce GHG emissions to help mitigate climate change, China currently aim to cut energy consumption per unit GDP by about 20% by 2010 compared with 2005 levels.
3. The total annual energy consumption combined commercial and residential (C&R) sectors in China accounts for about 20% of the country's total energy consumption each year. In the residential sector alone, the electricity consumption increases by 11% to 15% each year. Heating, Ventilation and Air Conditioning (HVAC) accounts for the highest energy consumption among the end uses in the C&R sector at 60 - 65%. About 10% is for air conditioning (i.e., cooling). The increasing demand for air conditioning both in the commercial and residential sectors is manifested in the increasing sales of room air conditioners (RACs), particularly in the residential sector.
4. Generally, the use of RACs account for the highest energy consumption among all types of household appliances. The current stock of room air conditioners consumes about 5.9% of total national electric power consumption, adding 43.5 GW of peak power consumption to national electricity demand, more than 2.5 times of the 17 GW capacity of the Three Gorges Dam. Considering the total RAC ownership will be doubled in the future 10 years, the utilization of RACs will account for a significant portion of the energy consumption and CO₂ emission generation of the country.

Global Environmental Objective

5. The reduction of China's future GHG emissions through transformation of the Chinese room air conditioner (RAC) market to production and sale of more energy-efficient RACs is the goal of the project. It is expected that with the market transformation that will ensue made possible by the removal of barriers to the wide scale manufacturing of EE RACs, and their subsequent use in China's C&R sector, CO₂ emission reduction of about 35.4 Mtons by end-of-project (EOP). This is realized from the cumulative energy savings till EOP of about 939.5 Mtce (2,337.1 GWh). The cumulative EOP energy savings is from the utilization of new RACs whose market share would have increased to 15%, and whose average efficiency (in terms of EER) is expected to increase cumulatively by 10% (from EER = 2.67 to EER = 2.94).

Baseline Activities

6. While at present there is in general an understanding about the benefits of using appliances that consume less electricity (i.e., energy saving or energy efficient), there are several barriers

as to why the widespread manufacturing and sale of EE RACs in the country is not realized. These barriers include: (a) Lack of expertise in the cost-effective design and manufacturing of energy-efficient RAC units; (b) Higher-efficiency air conditioning compressors are not available in the domestic market; (c) Lack of awareness and appreciation of the lifecycle economic benefits of high-efficiency RACs; (d) Lack of information for consumers about specific EE RAC models; and, (e) Dealer reluctance to stock and promote high-efficiency models.

7. Although the energy efficiency of RACs sold in the local market has been a concern of the GOC and the local RAC manufacturers, it is anticipated that the manufacture and use of low efficiency RACs will continue in the future if the identified barriers are not removed. Based on studies carried out during the project development stage, the baseline, or business-as-usual (BAU), scenario will most likely be characterized by the following:

• Average EER of Locally Manufactured RAC	2.67
• RAC Energy Consumption in C&R Sector (Mtce/yr) in:	
➤ 2010	4,558.3
➤ 2015	9514.5
➤ 2020	19,057.2
➤ 2025	37,099.1
• RAC Operations CO2 Emissions (Mtons/yr) in	
➤ 2010	109.9
➤ 2015	230.9
➤ 2020	465.4
➤ 2025	912.0

GEF Alternative

8. In the Alternative scenario, it is expected that the average energy efficiency for all RACs manufactured and sold in China will increase by at least 10% by the end of the PEERAC project. This is equivalent to raising the EER from 2.67 to 2.94), with a reach goal of 20% average energy efficiency gain (equivalent to raising the current EER from about 2.67 to 3.20). It is also expected under the alternative scenario that the market share of energy efficient (Grades 1 and 2) RACs will be at least 15% by end of project.

9. The realization of the Alternative Scenario is manifested by and large by the following:

• % improvement in the energy efficiency of RACs by end of project	10
• Average EER of RACs by end of project, W/kWh	2.94
• % market share of EE RACs by end of project:	15
• RAC Energy Consumption in C&R Sector (Mtce/yr) in:	
➤ 2010	4,557.2
➤ 2015	8,935.3
➤ 2020	15,746.8
➤ 2025	25,568.2
• Cumulative Energy Savings (Mtce) by end of project	939.5
• RAC Operations CO2 Emissions (Mtons/yr) in	
➤ 2010	108.3
➤ 2015	209.7
➤ 2020	365.8
➤ 2025	589.1
• Cumulative CO2 Emission Reductions (Mtons) by end of project	35.4

10. In line with the GEF Strategic Program No. 1, the proposed PEERAC project includes various interventions grouped into three (3) substantive components:
 - Component 1: AC Compressor Efficiency Upgrades
 - Component 2: RAC Efficiency Upgrades; and,
 - Component 3: Energy Efficient RAC Promotion
11. The expected outcomes from each of these components are as follows:
 - Outcome 1: More locally produced high efficiency AC compressors
 - Outcome 2: More locally produced high efficiency room air conditioners
 - Outcome 3: Enhanced enabling environment to support energy efficiency and Increased market share of EE RACs
12. **Component 1: AC Compressor Efficiency Upgrades** - This component includes activities that refer to one part of the “technology push” aspect of promoting the local manufacturing and utilization of EE RACs in China, and is focused mainly on the air conditioning compressors (ACCs). All identified barriers hindering the facilitation of such “technology push” will be addressed through the various barrier removal activities. It consists of capacity building activities (in-country and international) for the design and technical personnel of local ACC manufacturers; technical assistance to ACC manufacturers in the design and manufacturing of EE ACCs; institutional capacity development activities that will promote business partnerships among the local ACC and RAC manufacturers; monitoring and evaluation of the ACC market; and, ACC product testings and commercialization. The activities under this component will collectively cost about US\$ 4.12 million. Incremental activities will cost US\$ 919,650 which will be financed by the GEF.
13. **Component 2: RAC Efficiency Upgrades** - This component includes activities that refer to the other part of the “technology push” aspect of promoting the local manufacturing and utilization of EE RACs in China, and is focused mainly on the room air conditioners (RACs). All identified barriers hindering the facilitation of such “technology push” will be addressed through the various barrier removal activities. It consists of capacity building activities (in-country and international) for the design and technical personnel of local RAC manufacturers; intensive technical training on the design and manufacturing of EE RACs; technical assistance to RAC manufacturers in the design and manufacturing of EE RACs as well as the integrated approach to the proper handling and disposal of ODS refrigerants; monitoring and evaluation of the local RAC market; and, RAC product testings and commercialization. The activities under this component will collectively cost about US\$ 7.284 million. Incremental activities will cost US\$ 3,454,250 which will be financed by the GEF.
14. **Component 3: Energy Efficient RAC Promotion** - This component consists of all activities pertaining to the “demand pull” aspect of the promotion of local production of EE RACs and their wide scale utilization in China’s C&R sector. All identified barriers hindering the facilitation of such “demand pull” will be addressed through the various barrier removal activities. It consists of capacity building activities for the wide scale promotion of EE RACs to consumers in the C&R sector through various information, education and communication schemes; incentive programs for RAC manufacturers, RAC retailers, and RAC consumers;; development of tools for use in the EE RAC promotions (e.g., procurement guidelines, web-based tools); policy and institutional capacity development (e.g., RAC standards and labels; and EE RAC policies). The activities under this component will collectively cost about US\$ 14.393 million. Incremental activities will cost US\$ 1,273,400 which will be financed by the GEF.

Incremental Cost Matrix and Project Indicative Budget

15. The proposed budget for each project component is shown in Table 4 below. In total, the requested GEF financing is US\$ 6,263,000.

Table 4. Summary Cost of Each Project Component (US\$)

Project Component	Baseline	Incremental	Alternative
Component 1: AC compressor Efficiency Upgrades	3,200,000	919,650	4,119,650
Component 2: RAC Efficiency upgrades	3,830,000	3,454,250	7,284,250
Component 3: Energy Efficient RAC Promotion	13,120,000	1,273,400	14,393,400
Project Management	1,200,000	616,300	1,816,300
Total	21,350,000	6,263,600	27,613,600

16. The table below provides the summary of budget cost sharing among GEF and the co-financiers of the full-scale project by components/activities.

Table 5. PEERAC Cost Sharing Matrix (US\$)

Project Component	GEF	Nat'l Gov. Co-finance	Private Sector Co-finance	Total Co-finance	Total Cost
Component 1: AC Compressor Efficiency Upgrades	919,650	0	3,200,000	3,200,000	4,119,650
Component 2: RAC Efficiency Upgrades	3,454,250	30,000	3,800,000	3,830,000	7,284,250
Component 3: Energy Efficient RAC Promotion	1,273,400	120,000	13,000,000	13,120,000	14,393,400
Project Management	616,300	200,000	1,000,000	1,200,000	1,816,300
Total	6,263,600	350,000	21,000,000	21,350,000	27,613,600

Table 6. Summary of Project Co-Financing

Co-financing Source	Cash	In-kind	Total co-finance	Status
Government of China	150,000	200,000	350,000	Confirmed
Private Sector & Others	20,000,000	1,000,000	21,000,000	Confirmed
Total Co-financing	20,150,000	1,200,000	21,350,000	

17. The table below shows the incremental cost matrix. The baseline and alternative courses of actions are presented together with the costs of achieving them.

Table 7. Incremental Cost Matrix

Component	Baseline	Alternative	Increment
Global Environmental Benefits	None	CO2 emission reductions from the displacement of electricity that would have been used if the new RACs have typically low EER	Associated CO2 emission reductions from energy savings derived from the use of EE RACs that were purchased through PEERAC's incentive programs.
Domestic Benefits	<ul style="list-style-type: none"> Limited in terms of energy savings since typical low EER RACs will still be manufactured and sold in China 	<ul style="list-style-type: none"> Energy savings from the utilization of new EE RACs Energy cost savings from to the use of EE RACs Reduced electricity demand Increased awareness of consumers about the benefits of EE RACs 	<ul style="list-style-type: none"> Energy savings from the use of EE RACs purchased through PEERAC's incentive programs Energy cost savings from the use of EE RACs purchased through PEERAC's incentive programs
Component 1: AC Compressor Efficiency Upgrades	Business as Usual Individual ACC company training programs for technical/design personnel; individual R&D activities of ACC companies for COP improvement; proprietary private sector led ACC market surveys; ACC testing work in accredited testing centers	Proposed Situation Enhanced capacity building activities (in-country and international) for the design and technical personnel of local ACC manufacturers; technical assistance to ACC manufacturers in the design and manufacturing of EE ACCs; institutional capacity development activities that will promote business partnerships among the local ACC and RAC manufacturers; monitoring and evaluation of the ACC market; and, ACC product testings and commercialization	Additional Features Capacity building activities (in-country and international) for the design and technical personnel of local ACC manufacturers; technical assistance to ACC manufacturers in the design and manufacturing of EE ACCs; institutional capacity development activities that will promote business partnerships among the local ACC and RAC manufacturers; monitoring and evaluation of the ACC market; and, ACC product testings and commercialization
	Domestic Benefits <ul style="list-style-type: none"> Improved EE ACC design/technical capacity but limited only to ACC 	Domestic Benefits <ul style="list-style-type: none"> Improved EE performance of locally made ACC products 	Domestic Benefits <ul style="list-style-type: none"> Improved EE performance of locally made ACC products

Component	Baseline	Alternative	Increment
	<p>manufacturers with plans to improve ACC product COP.</p> <ul style="list-style-type: none"> • Updated information about EE performance of locally manufactured ACCs, but limited access to such information. 	<ul style="list-style-type: none"> • Improved promotion of locally produced ACCs • Increased market share of EE ACCs • Demonstration of the win/win nature of energy efficiency investments in the ACC industry • Improved level of design/technical capacity in the ACC industry. • Improved monitoring of, and information availability on, the ACC industry and market • Improved ACC testing capacities 	<ul style="list-style-type: none"> • Improved level of design/technical capacity in the ACC industry • Improved promotion of locally made EE ACCs • Improved monitoring of, and information availability on, the ACC industry and market • Improved ACC testing capacities.
	<p>Global Benefits</p> <ul style="list-style-type: none"> • Limited, dependent only on the sale of whatever volume of EE ACCs produced. 	<p>Global Benefits</p> <ul style="list-style-type: none"> • GHG emission reductions associated with the use of EE RACs that utilize EE ACCs 	<p>Global Benefits</p> <ul style="list-style-type: none"> • GHG emission reductions associated with the use of EE RACs that utilize EE ACCs
COST	US\$ 3,200,000	US\$ 4,119,650	US\$ 919,650
Component 2: RAC Efficiency Upgrades	<p>Business as Usual</p> <p>Individual RAC company training programs for technical/design personnel; individual R&D activities of RAC companies for EER improvement; private sector led RAC market surveys; RAC testing work in accredited testing centers; Individual corporate marketing activities for promoting RAC products.</p>	<p>Proposed Situation</p> <p>Capacity building activities (in-country and international) for the design and technical personnel of local RAC manufacturers supplementing corporate training activities; intensive technical training on the design and manufacturing of EE RACs; technical assistance to RAC manufacturers in the design and manufacturing of EE RACs as well as the integrated approach to the proper handling and disposal of ODS refrigerants; monitoring and evaluation of the local RAC market; and, RAC product</p>	<p>Additional Features</p> <p>Capacity building activities (in-country and international) for the design and technical personnel of local RAC manufacturers; intensive technical training on the design and manufacturing of EE RACs; technical assistance to RAC manufacturers in the design and manufacturing of EE RACs as well as the integrated approach to the proper handling and disposal of ODS refrigerants; monitoring and evaluation of the local RAC market; and, RAC product testings and commercialization.</p>

Component	Baseline	Alternative	Increment
		testings and commercialization.	
	Domestic Benefits <ul style="list-style-type: none"> Improved EE RAC design/technical capacity but limited only to RAC manufacturers with plans to improve RAC product EER. Updated information about EE performance of locally manufactured RACs, but limited access to such information. 	Domestic Benefits <ul style="list-style-type: none"> Improved EE performance of locally made RAC products Improved promotion of locally produced RACs Increased market share of EE RACs Demonstration of the win/win nature of energy efficiency investments in the RAC industry Improved level of design/technical capacity in the RAC industry. Improved monitoring of, and information availability on, the RAC industry and market Improved RAC testing capacities High-quality air conditioning at a lower energy cost ODS refrigerant issues are addressed in an integrated manner with improving air conditioner efficiency. 	Domestic Benefits <ul style="list-style-type: none"> Improved EE performance of locally made RAC products Improved level of design/technical capacity in the RAC industry Improved promotion of locally made EE RACs Improved monitoring of, and information availability on, the RAC industry and market Improved RAC testing capacities. High-quality air conditioning at a lower energy cost ODS refrigerant issues are addressed in an integrated manner with improving air conditioner efficiency.
	Global Benefits <ul style="list-style-type: none"> Limited, dependent only on the sale of whatever volume of EE RACs produced. 	Global Benefits <ul style="list-style-type: none"> GHG emission reductions associated with the use of EE RACs 	Global Benefits <ul style="list-style-type: none"> GHG emission reductions associated with the use of EE RACs
COST	US\$ 3,830,000	US\$ 7,284,250	US\$ 3,454,250
Component 3: EE RAC Promotions	Business as Usual Individual RAC company information gathering and R&D activities on product EER improvement; Ongoing national ES&L program activities on RACs; MP-related work on the	Proposed Situation Enhanced capacity building activities for the wide scale promotion of EE RACs to consumers in the C&R sector through various information, education and communication	Additional Features Capacity building activities for the wide scale promotion of EE RACs to consumers in the C&R sector through various information, education and communication schemes; incentive

Component	Baseline	Alternative	Increment
	handling and disposal of ODS; Individual corporate marketing activities for promoting RAC products.	schemes; continuous incentive programs for RAC manufacturers, RAC retailers, and RAC consumers even after PEERAC completion; development of tools for use in the EE RAC promotions (e.g., procurement guidelines, web-based tools); enhanced policy and institutional capacity development (e.g., RAC standards and labels; and EE RAC policies).	programs for RAC manufacturers, RAC retailers, and RAC consumers; development of tools for use in the EE RAC promotions (e.g., procurement guidelines, web-based tools); policy and institutional capacity development (e.g., RAC standards and labels; and EE RAC policies).
	<p>Domestic Benefits</p> <ul style="list-style-type: none"> • Improved EE RAC design/technical capacity but limited only to RAC manufacturers implementing R&D and projects to improve RAC product EER. • Local RAC manufacturers become aware of RAC energy performance standards, and provided guidance on how to comply with such standards • A segment of the society becomes aware of EE RACs • Actions towards eliminating ODS refrigerants initiated. 	<p>Domestic Benefits</p> <ul style="list-style-type: none"> • Demonstration of the win/win nature of energy efficiency investments, building a good basis for the GOC's continued support of its energy efficiency policy. • Increased awareness of consumers about EE RACs • Increased capacity of consumers to evaluate the energy and energy cost saving impacts of using EE appliances like EE RAC • Increased capacity of appliance retailers in promoting and marketing EE appliances like EE RACs • Opportunities for manufacturers to locally produce EE RACs, and for retailers to sell the same. • Opportunities for consumers to avail of EE RACs • Increased market share of EE RACs 	<p>Domestic Benefits</p> <ul style="list-style-type: none"> • Increased awareness of consumers about EE RACs • Increased capacity of consumers to evaluate the energy and energy cost saving impacts of using EE appliances like EE RAC • Increased capacity of appliance retailers in promoting and marketing EE appliances like EE RACs • Opportunities for manufacturers to locally produce EE RACs, and for retailers to sell the same. • Opportunities for consumers to avail of EE RACs • High-quality air conditioning at a lower energy cost • Strengthened EE policies, particularly on the use of EE RACs, as well as policies on the use of non-ODS or at least low GWP

Component	Baseline	Alternative	Increment
		<ul style="list-style-type: none"> • High-quality air conditioning at a lower energy cost • Strengthened EE policies, particularly on the use of EE RACs, as well as policies on the use of non-ODS or at least low GWP refrigerants. • Indirectly, investments for additional power capacity can be invested into socio-economic and poverty alleviation projects. 	refrigerants. <ul style="list-style-type: none"> • Indirectly, investments for additional power capacity can be invested into socio-economic and poverty alleviation projects.
	Global Benefits <ul style="list-style-type: none"> • Limited, dependent only on the sale of whatever volume of EE RACs produced. 	Global Benefits <ul style="list-style-type: none"> • GHG emission reductions associated with the use of EE RACs • Action plans for eliminating high GWP refrigerants. 	Global Benefits <ul style="list-style-type: none"> • GHG emission reductions associated with the use of EE RACs • Action plans for eliminating high GWP refrigerants.
COST	US\$ 13,120,000	US\$ 14,393,400	US\$ 1,273,400
Project Management Unit Support Cost (including M&E)	US\$ 1,200,000	US\$ 1,816,300	US\$ 616,300
TOTAL COST	US\$ 21,350,000	US\$ 27,613,600	US\$ 6,263,600

PART II: Logical Framework Analysis (Project Planning Matrix)

Table 8. Project Planning Matrix (PPM)

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
Project Goal: Reduction of GHG emissions from room air conditioning in China's residential and commercial sectors	Cumulative CO2 emission reductions from start of project to end-of-project (EOP), Mtons CO ₂ eq	0	35.4	RAC Manufacturer Reports in AMIS RAC Market Reports; Project M&E Reports	Air conditioner ownership and use will continue to grow or at least not decrease
Project Objective: Significantly improved room air conditioner energy efficiency in China.	Average RAC energy efficiency gain by EOP, %	0	10	RAC Manufacturer Reports in AMIS	Sustained demand for RAC
	Cumulative energy savings from the use of EE RACs by EOP, Mtce	0	939.5	RAC Market Reports; Project M&E Reports	RAC Manufacturers provide necessary data
Component 1: AC Compressor Efficiency Upgrades					
Output 1.1: Completed and Evaluated In-country Technical Training on High Efficiency AC Compressor Design and Manufacturing					
Activity 1.1.1: <u>Capacity Needs Assessment of Local ACC Manufacturers</u>	Number of completed Assessment Reports by mid-Year 1	0	1	Capacity Needs Assessment Report	Manufacturers willing to participate in training activities; adequate number/share of trainees remain employed in ACC/RAC industry to ensure sustainable impact
Activity 1.1.2: <u>AC Compressor Technology Training Workshop Design and Implementation</u>	Number of training workshops designed, organized and conducted by end Year 2	0	2	Training Materials; Training Reports & Evaluation Reports	
	Number of individuals trained by end Year 2	0	24	Training Reports; Training Certificates Issued	
Activity 1.1.3: <u>Evaluation of In-Country AC Compressor Technical Training</u>	Percentage of trainees that rated the training workshop training as good/excellent by EOP, %	N/A	75	Post-Training Surveys	
	Proportion of trainees still involved in ACC design/production at company and/or sector at EOP, %	N/A	75	Post Training Surveys; Information on trainee retention in AMIS	
Output 1.2: Completed and Evaluated International Technical Training on High Efficiency AC Compressor Design and Manufacturing					
Activity 1.2.1: <u>International AC Compressor Technology Training Course Design and Implementation</u>	Number of international training courses designed, organized and conducted by end Year 1	0	1	Training Materials; Training Reports; Training Certificates Issued	World class quality training center or training program designer and implementer is identified.
	Number of individuals trained by end Year 1	0	8	Training Reports; Training Certificates Issued	

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
Activity 1.2.2: <u>Evaluation of International AC Compressor Technical Training</u>	Percentage of trainees that rated the training course as good/excellent by EOP, %	N/A	75	Post-Training Surveys	
	Proportion of trainees still involved in ACC design/production at company and/or sector at EOP, %	N/A	75	Post Training Surveys; Information on trainee retention in AMIS	
Output 1.3: Manufacturer Dialogue and Product Planning					
Activity 1.3.1: <u>Organization and Conduct of an ACC Manufacturer Dialogue and Product Planning Workshop</u>	Number of participating ACC & RAC manufacturers in workshop held by end Year 3	0	18	Documentation of Workshop Proceedings	Majority of ACC and RAC manufacturers willing to cooperate with each other
Activity 1.3.2: <u>Coordination and Evaluation of Follow-up Manufacturer Dialogue</u>	Cumulative number of follow-up dialogue meeting held by EOP	0	5	Project activity reports; Project progress reports; Dialogue meeting minutes	
	Average number of participating ACC & RAC manufacturers in each dialogue meeting	0	At least 2		
	Number of EE RACs using new EE ACCs by end Year 4	0	At least 1	Technical report on EE RAC models and ACCs used	
Output 1.4: Completed Technical Assistance on EE Compressor Design and Production					
Activity 1.4.1: <u>Selection of Local ACC Manufacturers for TA Provision</u>	Number of ACC manufacturers selected for on-site TA activities by end year 1	0	6	Project activity report; Project progress report	ACC manufacturers willing to fully participate in the TA Program; ACC Manufacturers fully disclose necessary information on processes and systems that need TA. PEERAC experts are bound to fulfill confidentiality agreements.
Activity 1.4.2: <u>ACC Manufacturing TA Program</u>	Number of design, manufacturing and technical services provided under the TA program by Year 2	0	30	Technology Assistance Reports	
Activity 1.4.3: <u>Evaluation of ACC Manufacturing TA Program</u>	Percentage of manufacturers that rated the TA service they received as good/excellent by EOP, %	N/A	75	Survey of manufacturers	
	Proportion of ACC manufacturers that received TA services producing EE ACC products by EOP, %	N/A	75	Survey of manufacturers; Information in AMIS	
Output 1.5: Commercialized EE Compressor Products					

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
Activity 1.5.1: <u>Product Commercialization Contracting and Mobilization</u>	Sales-weighted percentage of ACC manufacturers signing participation contracts by end Year 1, %	0	50 - 60	Project activity report; copy of signed manufacturer contracts; Project progress reports	ACC manufacturers of selected EE ACC models are able and willing to commercialize new products and will not be adversely affected by economic crisis.
Activity 1.5.2: <u>Product Design Implementation</u>	Average AC compressor efficiency (COP) by EOP	2.67	2.94	Project activity reports; EE ACC performance test reports	
Activity 1.5.3: <u>Selection of Product Commercialization Models</u>	Number of bids received for incentives on new EE ACCs developed (COP = 3.4 @ 20% EE gain)/ by end Year 3	0	6	Project activity reports	
Activity 1.5.4: <u>Product Commercialization Implementation</u>	EE ACC market share by EOP, %	5	15	Information in AMIS	
	Number of EE ACC models provided incentive funding (for incremental cost) by end Year 4	0	3	Project activity reports; Documentation of incentive funding	
Activity 1.5.5: <u>Monitoring and Review of the Product Commercialization Program</u>	Number of interested ACC manufacturers that are planning to produce or already producing the new EE ACC models by EOP	0	3	Project progress reports; Information in AMIS	
Output 1.6: Compilation of ACC Market and Performance Information					
Activity 1.6.1: <u>Air Conditioner Information System Design and Establishment</u>	Information System (AMIS) established by end Year 1	0	Year 2010	AMIS housed at suitable entity to be selected as administrator	Participating ACC manufacturers are willing to comply with the reporting requirements
Activity 1.6.2: <u>ACC Information Collection and Annual Reporting</u>	Average percentage of ACC manufacturers submitting reports annually to AMIS starting Year 1, %	0	100	Project activity report; Copy of information reports submitted by manufacturers	
	Percentage of ACC manufacturers that rated the AMIS as useful by EOP, %	0	80	Survey reports	
Output 1.7: Completed EE Compressor Product Testing					
Activity 1.7.1: <u>AC Compressor Testing Center Establishment</u>	Appliance testing facility selected and established as ACC Testing Center by end Year 1	0	Year 2010	Project activity report; Terms of Reference for selected ACC Testing Center	Selected testing facility will continuously serve as ACC Testing Center after PEERAC

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
Activity 1.7.2: <u>ACC Product Testing</u>	Percentage of ACC manufacturers that participated in product testing by EOP, %	0	100	Project activity report; Copies of product testing reports	Manufacturers willing to provide ACC product samples for product testing
Activity 1.7.3: <u>ACC Product Testing Results Reporting</u>	Percentage of manufacturers that rated the ACC Product Testing as useful & good/excellent by EOP, %	0	80	Project activity report, Survey reports, Information in AMIS	
	Proportion of ACC manufacturers that made use of the product testing results in improving their EE ACC products by EOP, %	0	80	Project activity report, Survey reports, Information in AMIS	
Component 2: RAC Efficiency Upgrades					
Output 2.1: International Technical Training on High Efficiency RAC Design and Manufacturing					
Activity 2.1.1: <u>International Room Air Conditioner Technology Training Course Design and Implementation</u>	Number of international training courses designed, organized and conducted by end Year 2	0	1	Training Materials; Training Reports; Training Certificates Issued	World class quality training center or training program designer and implementer is identified.
Activity 2.1.2: <u>Evaluation of International Room Air Conditioner Technical Training</u>	Number of individuals trained by end Year 2	0	12	Training Reports; Training Certificates Issued	
	Percentage of trainees that rated the training course as good/excellent by EOP, %	N/A	75	Post-Training Surveys	
	Proportion of trainees still involved in RAC design/production at company and/or sector at EOP, %	N/A	75	Post Training Surveys; Information on trainee retention in AMIS	
Output 2.2: In-country technical training on high efficiency RAC design and manufacturing					
Activity 2.2.1: <u>Capacity Needs Assessment of Local RAC Manufacturers</u>	Number of completed Assessment Reports by mid-Year 1	0	1	Capacity Needs Assessment Report	Manufacturers willing to participate in training activities; adequate number/share of trainees remain employed in RAC sector to ensure sustainable impact
Activity 2.2.2: <u>RAC Technology Training Workshop Design and Implementation</u>	Number of training workshops designed, organized and conducted by end Year 1	0	2	Training Materials; Training Reports & Evaluation Reports	
	Number of individuals trained by end Year 2	0	48	Training Reports; Training Certificates Issued	

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
Activity 2.2.3: <u>Evaluation of In-Country RAC Technical Training</u>	Percentage of trainees that rated the training workshop training as good/excellent by EOP, %	N/A	75	Post-Training Surveys	
	Proportion of trainees still involved in RAC design/production at company and/or sector at EOP, %	N/A	75	Post Training Surveys; Information on trainee retention in AMIS	
Output 2.3: Completed Intensive RAC Design Training					
Activity 2.3.1: <u>Development of Intensive RAC Design Training Course</u>	A comprehensive intensive RAC design and manufacturing training course by end Year 2	0	Year 2011	Intensive RAC training course manual; Project Activity report	World class training center is selected for the course design and implementation
Activity 2.3.2: <u>Preparation of Initial RAC Prototypes/Models</u>	Number of EE RAC prototypes or models prepared by selected RAC manufacturers by Year 3	0	6	Actual models/prototypes of EE RACs; Documentation on the models/prototypes.	RAC manufacturers finance the model or prototype production
Activity 2.3.3: <u>Conduct and Evaluation of the Intensive RAC Design Training Course</u>	Number of intensive training courses conducted by end Year 4	0	4	Training Materials; Training Reports & Evaluation Reports	Manufacturers willing to participate in training activities; adequate number/share of trainees remain employed in RAC sector to ensure sustainable impact
	Number of manufacturers trained by end Year 4	0	6	Training Reports	
	Total number of individuals trained under this Output by end year 4	0	24	Training Reports; Training Certificates Issued	
	Percentage of trainees that rated the training course as good/excellent by EOP, %	N/A	75	Post-Training Surveys	
	Proportion of trainees still involved in RAC design/production at company and/or sector at EOP, %	N/A	75	Post Training Surveys; Information on trainee retention in AMIS	
Output 2.4: Completed Technical Assistance on EE RAC Design and Production					
Activity 2.4.1: <u>Selection of Local RAC Manufacturers for TA Provision</u>	Number of RAC manufacturers selected for on-site TA activities by end year 1	0	12	Project activity report; Project progress report	RAC manufacturers willing to fully participate in the TA Program; RAC Manufacturers fully disclose necessary information on processes and systems that need TA. PEERAC experts are bound to
Activity 2.4.2: <u>RAC Manufacturing TA Program</u>	Number of design, manufacturing and technical services provided under the TA program by Year 4	0	60	Technology Assistance Reports	
Activity 2.4.3: <u>Evaluation of RAC Manufacturing TA Program</u>	Percentage of manufacturers that rated the TA service they received as good/excellent by EOP, %	N/A	75	Survey of manufacturers	

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
	Proportion of RAC manufacturers that received TA services producing EE RAC products by EOP, %	N/A	75	Survey of manufacturers; Information in AMIS	fulfill confidentiality agreements.
Output 2.5: Commercialization of EE RAC Products					
Activity 2.5.1: <u>Product Commercialization Contracting and Mobilization</u>	Sales-weighted percentage of RAC manufacturers signing participation contracts by end Year 1, %	0	75	Project activity report; copy of signed manufacturer contracts; Project progress reports	RAC manufacturers of selected EE RAC models are able and willing to commercialize new products and will not be adversely affected by economic crisis.
Activity 2.5.2: <u>Product Design Implementation</u>	Average RAC (EER) by EOP	2.67	2.94	Project activity reports; EE RAC performance test reports	
Activity 2.5.3: <u>Selection of Product Commercialization Models</u>	Number of bids received for incentives on new EE RACs developed (EER = 2.944 @ 10% EE gain)/ by end Year 4	0	12	Project activity reports	
Activity 2.5.4: <u>Product Commercialization Implementation</u>	EE RAC market share by EOP, %	5	15	Information in AMIS	
	Number of EE RAC models provided incentive funding (for incremental cost) by end Year 4	0	12	Project activity reports; Documentation of incentive funding	
Activity 2.5.5: <u>Monitoring and Review of the Product Commercialization Program</u>	Number of interested RAC manufacturers that are planning to produce or already producing the new EE RAC models by EOP	0	12	Project progress reports; Information in AMIS	
Output 2.6: RAC Efficiency Standards					
Activity 2.6.1: <u>Development of RAC Energy Performance Standards</u>	Proposed standards for new minimum EER for RACs by mid Year 4	0	Year 2013	Documentation on proposed new EER standards for RACs	There are no significant delays in new standard implementation to avoid negative impacts; New minimum EER standard will be adequately enforced
Activity 2.6.2: <u>Revision of Current RAC Energy Performance Standards</u>	Number of comments and recommendations considered for the revision of EER Standards by end Year 4	0	At least 2	Documentation of comments and recommendations considered in the Standards revision	
Activity 2.6.3: <u>Formal & Informal Discussions on Revised Standards</u>	Number of provisions in EER standards for recommendation for approval by GOC policymakers by end Year 4	0	At least 2	Minutes of advocacy meetings conducted; Documentation of policies	

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
Activity 2.6.4: <u>Publication and Capacity Building on the Revised Standards Compliance</u>	Published new standards on minimum EER of RACs	0	Year 2014	Standards publication; Project activity report; Project progress report	
	% of RAC manufacturers that indicated they can comply with the new set min EER standards by EOP, %	0	100	Project activity report; Project progress report	
	% of RAC manufacturers that received advice on how to comply with new set minimum EER standards, %	0	25	Project activity report; Project progress report	
Activity 2.6.5: <u>Evaluation of the Impacts of the Revised Standards Enforcement</u>	Market share of EE RACs by EOP	5	15	Project activity report; Project progress report	
Output 2.7: Compilation of RAC Market and Performance Information					
Activity 2.7.1: <u>Definition of RAC Information for Inclusion in AMIS</u>	Information System (AMIS) established by end Year 1	0	Year 2010	AMIS housed at suitable entity to be selected as administrator	Participating RAC manufacturers are willing to comply with the reporting requirements
Activity 2.7.2: <u>RAC Information Collection and Annual Reporting</u>	Percentage of RAC manufacturers submitting reports each year to AMIS starting Year 1, %	0	100	Project activity report; Copy of information reports submitted by manufacturers	
	Percentage of RAC manufacturers that rated the AMIS as useful by EOP, %	0	80	Survey reports	
Output 2.8: Completed EE RAC Product Testing					
Activity 2.8.1: <u>Room Air Conditioner Testing Center Establishment</u>	Appliance testing facility selected and established as RAC Testing Center by end Year 1	0	Year 2010	Project activity report; Terms of Reference for selected RAC Testing Center	Selected testing facility will continuously serve as RAC Testing Center after PEERAC
Activity 2.8.2: <u>RAC Product Testings</u>	Percentage of RAC manufacturers that participated in product testing by EOP, %	0	100	Project activity report; Copies of product testing reports	Manufacturers willing to provide RAC product samples for product testing
Activity 2.8.3: <u>RAC Product Testing Results Reporting</u>	Percentage of manufacturers rating the RAC Product Testing as useful and good/excellent by EOP, %	0	80	Project activity report, Survey reports, Information in AMIS	

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
	Proportion of RAC manufacturers that made use of the product testing results in improving their EE RAC products by EOP, %	0	80	Project activity report, Survey reports, Information in AMIS	
Output 2.9: Policy Recommendations and Information, Education and Communication Materials on Addressing ODS Refrigerant Replacement and Disposal					
Activity 2.9.1: <u>Formulation of Policy Recommendations on Proper ODS Refrigerant Management and Disposal</u>	Completed satisfactory acceptable policy study on the most cost-effective approach for managing the old refrigerants from old RACs	0	Year 2011	Policy Study; Project activity report; Project progress report	GOC is continuously committed to its obligations to the Montreal Protocol
	Proposed national policy and set of guidelines for the management and disposal/destruction of the ODS refrigerants	0	Year 2012	Documentation of formulated policies and guidelines; Project activity report; Project progress report	
Activity 2.9.2: <u>Development of Information, Education and Communication Materials on ODS Refrigerant Management and Disposal</u>	Completed and published guidebook on managing and disposal of ODS containing old RACs and other refrigeration appliances/equipment	0	Year 2012	Published guidebook; Project activity report	RAC manufacturers support GOC's commitment to meet obligations to the Montreal Protocol
	Number of ACC/RAC manufacturers, refrigerant traders and suppliers that committed to use the guidebook in their action plans to address the ODS refrigerant issues by EOP	0	At least 50	Survey report; Information in AMIS; project activity report	
Component 3: Energy Efficient RAC Promotion					
Output 3.1: High Efficiency RAC Procurement Guide and Procurement Promotion					
Activity 3.1.1: <u>Review of Typical Corporate RAC Procurement Procedures</u>	Completed survey/review report on typical corporate RAC procurement procedures/practices	0	Year 2013	Survey/Review report; Project activity report	RAC procurement program is continued by a suitable entity after PEERAC
Activity 3.1.2: <u>Formulation of RAC Procurement Guidelines</u>	A procurement guide for RACs with standardized information for group procurement of EE RACs	0	Year 2014	Published RAC Procurement Guide; Project activity report	
	Number of organizations receiving procurement guides by EOP	0	100	Project activity report	

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
Activity 3.1.3: <u>Promotion of the Application of the RAC Procurement Guidelines</u>	Number of organizations that either have committed or have carried out actions, to procure EE RACs by EOP	0	At least 50	Project activity report	
Activity 3.1.4: <u>EE RAC Procurement Guidelines Effectiveness Evaluation</u>	Number of organizations finding the RAC procurement guides useful by EOP	0	At least 75	Project activity report	
Output 3.2: RAC Retailer Program					
Activity 3.2.1: <u>Capacity Needs Assessment of Local RAC Retailers</u>	Number of completed Assessment Reports by mid-Year 4	0	1	Assessment Report; Project activity report	Adequate number of RAC manufacturers and retailers participate in the program; Manufacturer ability and willingness to participate in project is not impacted by economic crisis
Activity 3.2.2: <u>RAC Retailer Training Workshop Design and Implementation</u>	Number of retailers that received training and informational materials by end Year 4	0	50	Training course materials; Information materials on EE RACs; Training reports; Project activity reports	
Activity 3.2.3: <u>Conduct of In-Store Marketing of EE RAC</u>	Number of retailers that implemented in-store marketing using received promotional materials by EOP	0	1,000	Project activity report	
Activity 3.2.4: <u>Retail Incentive Program Design and Implementation</u>	Number of EE RACs that were sold under the Retail Incentive Program by EOP	0	100,000	Retail Incentive Program Report from RAC retailers	
Activity 3.2.5: <u>Evaluation of the RAC Retailer Program</u>	Number of RAC manufacturers by EOP that find the RAC Retailer Program useful for promoting EE RACs, and committed to strategically employ it after PEERAC	0	8	Retail Incentive Program Evaluation Report	
	Percentage of RAC retailers by EOP that find the RAC Retailer Program useful for promoting EE RACs	0	70	Retail Incentive Program Evaluation Report	
	Percentage of consumers that find the RAC Retailer Program useful for promoting EE RACs by EOP	0	70	Retail Incentive Program Evaluation Report	
Output 3.3: RAC Rebate/Recycling Program Design and Implementation					

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
Activity 3.3.1: <u>Conduct of RAC Rebate Program Workshop</u>	Number of RAC manufacturers that committed to develop and implement a rebate/recycling program by end Year 3	0	12	Documentation of workshop proceedings	Adequate number of RAC manufacturers and retailers participate in the program; Manufacturer ability and willingness to participate in project is not impacted by economic crisis
Activity 3.3.2: <u>RAC Rebate Program Design</u>	Number of rebate/recycling program plans submitted to PEERAC by end Year 4	0	12	Documentation of submitted rebate/recycling plans	
	Number of rebate/recycling program plans approved by the PEERAC PAC by end Year 4	0	12	Documentation of approved rebate/recycling plans	
Activity 3.3.3: <u>RAC Rebate Program Implementation</u>	Total number of inefficient RACs retired, recycled, and replaced with new efficient ones through the approved rebate/recycling programs by end Year 5	0	16,000	Rebate/Recycling Program Reports from RAC manufacturers	
Activity 3.3.4: <u>RAC Rebate Program Evaluation and Incentive Award Issuance</u>	Percentage of total number of EE RACs sold under the program accounted for by the top 3 RAC manufacturers by end Year 5	0	At least 50	RAC Rebate/Recycling Program Evaluation Report	
	Number of RAC manufacturers by EOP that find the RAC Rebate/Recycling Program useful for promoting EE RACs, and committed to strategically employ it after PEERAC	0	8	RAC Rebate/Recycling Program Evaluation Report	
	Percentage of RAC retailers by EOP that find the RAC Rebate/Recycling Program useful for promoting EE RACs by EOP, %	0	70	RAC Rebate/Recycling Program Evaluation Report	
	Percentage of consumers that find the RAC Rebate/Recycling Program useful for promoting EE RACs by EOP, %	0	70	RAC Rebate/Recycling Program Evaluation Report	
Output 3.4: Enhancement of the National EE Label for RACs					
Activity 3.4.1: <u>Review of RAC Labeling System</u>	Completed review of existing RAC energy labeling system by end Year 4	0	Year 2013	Review Report	Modified labeling program can be

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
Activity 3.4.2: <u>Modification of the RAC Energy Labeling Program</u>	Percentage of provisions in the existing RAC labeling program that were modified in the new approved program by end Year 4, %	0	25	Documentation of proposed changes/modifications to existing RAC energy labeling	implemented; new labeling approaches increase EE purchases
Activity 3.4.3: <u>Planning and Promotion of the RAC Energy Labeling Program</u>	Number of promotional workshops conducted by Year 4	0	2	Documentation of workshop proceedings; EE label marketing plan	
Activity 3.4.4: <u>Implementation of the RAC Energy Labeling Program</u>	Percentage of RAC brands that qualify for the new EE RAC energy label by EOP, %	0	10	Consumer survey reports	
Activity 3.4.5: <u>Evaluation of the Modified RAC Energy Labeling Program</u>	EE RAC market share by EOP, %	5	15	Information in AMIS	
Output 3.5: Completed Consumer Education Campaign					
Activity 3.5.1: <u>Survey on Level of Consumer Awareness about EE RACs</u>	Completed consumer awareness survey by mid-Year 3	0	Year 2012	Consumer survey report	
Activity 3.5.2: <u>Development of a Consumer Education Program</u>	Number of consumer education programs developed by end Year 3	0	1+	Consumer Education Program documents; ICE materials	
Activity 3.5.3: <u>Implementation of the Consumer Education Program</u>	Number of completed consumer education events	0	5	Consumer Education Program Implementation Reports	
Activity 3.5.4: <u>Implementation of Cooperative Advertising Campaign with Manufacturers</u>	Number of advertisement templates and materials developed by end Year 3	0	At least 2	Documentation of advertisement templates and materials	RAC manufacturers will support cooperative advertising program
	US\$ value of EE RAC project related advertising placed by manufacturers by end Year 5	0	7.5 million	Advertisements; Ad tracking and verification reports	
Activity 3.5.5: <u>Evaluation of the Consumer Education Program</u>	Share of RAC advertising by manufacturers for high efficiency products by EOP, %	0	10	Survey results; Consumer Education Program Evaluation Reports; AMIS Information	
Activity 3.5.6: <u>Development of a</u>	EE RAC market share by EOP, %	5	15	RAC market survey; Information in AMIS	

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
<u>Sustainable Continuing Education Program</u>	% Increase in number of consumers that are either planning or are ready to purchase EE RAC by EOP	0	10	Consumer survey results; Information in AMIS	
Output 3.6: Web-based Tools					
Activity 3.6.1: <u>Website Design, Implementation and Maintenance</u>	Designed website including, website materials and operational plan by Year 1	0	Year 2010	Website materials and operational plan; Project activity reports	
	No. of officially established access to other related domestic and foreign-based websites/databases by EOP	0	At least 5	Website; Signed agreements of database sharing (if any)	Partnership with other website/database keepers continuous even after PERAC
Activity 3.6.2: <u>Development of Web-based Tools</u>	Cumulative number of users of web-based tools by EOP	0	100,000	Website user surveys	
Activity 3.6.3: <u>Promotion and Launching of the Website</u>	Officially launched and operational website by end Year 1	0	Year 2010	Project activity reports	
Activity 3.6.4: <u>Evaluation of the Website Performance</u>	Total number of page views and/or downloads by EOP	0	350,000	Project activity reports; Website user survey	
	Total number of RAC purchase decisions affected by EOP	0	10,000		
	% of website users each year that are satisfied with information downloaded starting Year 2, %	0	50	Website user surveys	
	% share of participating RAC manufacturers that link to website for cross-promotion by EOP, %	0	50	Project activity report	
	Number of new informational and promotional products available each year in website starting Year 2	0	12	Project activity report	
Output 3.7: Completed EE RAC Public Relations Campaign					
Activity 3.7.1: <u>Preparation and Publication of Articles on EE RAC</u>	Number of articles on EE RACs published throughout the project duration by EOP	0	60	Published articles on EE RACs	Media outlets will be willing to place project sponsored materials

Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Assumptions
	Indicator	Baseline	Target		
Activity 3.7.2: <u>Presentation of PR Campaign Achievements</u>	% of cumulative EE RAC sales that were directly influenced by the PR campaigns by EOP, %	0	25	Press conference materials; documentation of workshop proceedings; RAC market survey reports	
Output 3.8: RAC Energy Efficiency Policy Promotion					
Activity 3.8.1: <u>Conduct of EE Air Conditioning Policy Studies</u>	Number of completed satisfactorily acceptable policy studies by EOP	0	At least 2	Completed policy study reports; project activity report	GOC is continuously supportive and committed EE
Activity 3.8.2: <u>Organization and Conduct of EE Air Conditioning Policy Workshop</u>	Number of EE air conditioning policy materials prepared, presented and disseminated to GOC policy makers by Year 2	0	At least 2	Documentation of proposed EE air conditioning policies; Documentation of workshop proceedings; Project activity report	
Activity 3.8.3: <u>Conduct of International Policy Exchange</u>	Number of policies from other countries that were considered for the improvement of existing EE policies by end Year 3	0	At least 2	Documentation of study tour findings and recommendations; Project activity report	
Activity 3.8.4: <u>Conduct of an International ODS Workshop</u>	Number of policies on ODS refrigerant management (including implementing rules & guidelines) from other countries considered in the formulation of ODS management policy recommendations in China by Year 3	0	3	Documentation of proposed policies (and implementing rules & guidelines); Project activity report	
Activity 3.8.5: <u>Conduct of Targeted Policy Coordination Meetings</u>	Cumulative number of targeted policy coordination meetings conducted by EOP	0	10	Minutes of meetings; Project activity report	Relevant GOC agencies support the policy formulation process; Advocacy and lobbying efforts for the approval of proposed policies is allowed.
	Number of EE air conditioning & ODS refrigerant management policy recommendations accepted for consideration of approval by the relevant GOC authorities by EOP	0	At least 2	Documentation of recommended policies	

SECTION III: Budget and Work Plan

Table 9. PEERAC Project Annual Budget and Work Plan

Award ID:	00058517	Project ID(s):	00072708
Award Title:	China: PIMS 4040 CC FP: Promoting Energy Efficient Room Air Conditioners (PEERAC) Project		
Business Unit:	CHN10		
Project Title:	China: PIMS 4040 CC FP: Promoting Energy Efficient Room Air Conditioners (PEERAC) Project		
PIMS No.	4040		
Implementing Partner (Executing Agency)	China Ministry of Environmental Protection		

Component	Responsible Agency	Source	Budget Code	Description	Annual Expenses (US\$)					Total Cost (US\$)
					Year 1	Year 2	Year 3	Year 4	Year 5	
Component 1: AC Compressor Efficiency Upgrades										
Output 1.1:	FECO	GEF	71200	International Consultants	28,800	28,800	-	-	-	57,600
Completed and Evaluated In-country Technical Training on High Efficiency AC Compressor Design and Manufacturing	FECO	GEF	71300	National Consultants	4,950	4,950	-	-	-	9,900
	FECO	GEF	72100	Contractual Services	31,500	31,500	-	-	-	63,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					65,250	65,250	-	-	-	130,500
Output 1.2:	FECO	GEF	71200	International Consultants	3,000	-	-	-	-	3,000
Completed and Evaluated International Technical Training on High Efficiency AC Compressor Design and Manufacturing	FECO	GEF	71300	National Consultants	1,750	-	-	-	-	1,750
	FECO	GEF	72100	Contractual Services	60,000	-	-	-	-	60,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					64,750	-	-	-	-	64,750
Output 1.3:	FECO	GEF	71200	International Consultants	-	-	-	-	-	-
Manufacturer Dialogue and Product Planning	FECO	GEF	71300	National Consultants	-	-	1,750	1,000	-	2,750
	FECO	GEF	72100	Contractual Services	-	-	19,600	-	-	19,600
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					-	-	21,350	1,000	-	22,350

Component	Responsible Agency	Source	Budget Code	Description	Annual Expenses (US\$)					Total Cost (US\$)
					Year 1	Year 2	Year 3	Year 4	Year 5	
Output 1.4: Completed Technical Assistance on EE Compressor Design and Production	FECO	GEF	71200	International Consultants	-	29,600	-	-	-	29,600
	FECO	GEF	71300	National Consultants	-	12,850	-	-	-	12,850
	FECO	GEF	72100	Contractual Services	-	-	-	-	-	-
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	6,600	-	-	-	6,600
<i>Sub-total</i>					-	49,050	-	-	-	49,050
Output 1.5: Commercialized EE Compressor Products	FECO	GEF	71200	International Consultants	-	-	-	-	-	-
	FECO	GEF	71300	National Consultants	1,000	200	400	400	-	2,000
	FECO	GEF	72100	Contractual Services	-	-	-	-	510,000	510,000
	FECO	GEF	74500	Training & Workshops	10,000	1,000	1,000	2,000	-	14,000
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					11,000	1,200	1,400	2,400	510,000	526,000
Output 1.6: Compilation of ACC Market and Performance Information	FECO	GEF	71200	International Consultants	-	-	-	-	-	-
	FECO	GEF	71300	National Consultants	1,000	-	-	-	-	1,000
	FECO	GEF	72100	Contractual Services	12,000	7,000	7,000	7,000	7,000	40,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					13,000	7,000	7,000	7,000	7,000	41,000
Output 1.7: Completed EE Compressor Product Testing	FECO	GEF	71200	International Consultants	-	-	-	-	-	-
	FECO	GEF	71300	National Consultants	1,000	-	-	-	-	1,000
	FECO	GEF	72100	Contractual Services	30,000	12,500	12,500	15,000	15,000	85,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					31,000	12,500	12,500	15,000	15,000	86,000
Component 1 TOTAL					185,000	135,000	42,250	25,400	532,000	919,650
Component 2: RAC Efficiency Upgrades										
Output 2.1: International Technical Training on High Efficiency RAC Design and Manufacturing	FECO	GEF	71200	International Consultants	-	3,000	-	-	-	3,000
	FECO	GEF	71300	National Consultants	-	1,750	-	-	-	1,750
	FECO	GEF	72100	Contractual Services	-	84,000	-	-	-	84,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-

Component	Responsible Agency	Source	Budget Code	Description	Annual Expenses (US\$)					Total Cost (US\$)
					Year 1	Year 2	Year 3	Year 4	Year 5	
<i>Sub-total</i>					-	88,750	-	-	-	88,750
Output 2.2: In-country technical training on high efficiency RAC design and manufacturing	FECO	GEF	71200	International Consultants	28,800	28,800	-	-	-	57,600
	FECO	GEF	71300	National Consultants	5,750	5,750	-	-	-	11,500
	FECO	GEF	72100	Contractual Services	46,500	46,500	-	-	-	93,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					81,050	81,050	-	-	-	162,100
Output 2.3: Completed Intensive RAC Design Training	FECO	GEF	71200	International Consultants	-	-	1,500	1,500	-	3,000
	FECO	GEF	71300	National Consultants	-	-	2,500	2,500	-	5,000
	FECO	GEF	72100	Contractual Services	-	-	365,000	365,000	-	730,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					-	-	369,000	369,000	-	738,000
Output 2.4: Completed Technical Assistance on EE RAC Design and Production	FECO	GEF	71200	International Consultants	-	-	-	59,200	-	59,200
	FECO	GEF	71300	National Consultants	-	-	-	25,700	-	25,700
	FECO	GEF	72100	Contractual Services	-	-	-	-	-	-
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	13,200	-	13,200
<i>Sub-total</i>					-	-	-	98,100	-	98,100
Output 2.5: Commercialization of EE RAC Products	FECO	GEF	71200	International Consultants	-	-	-	-	-	-
	FECO	GEF	71300	National Consultants	1,000	200	200	600	-	2,000
	FECO	GEF	72100	Contractual Services	-	-	-	-	1,950,000	1,950,000
	FECO	GEF	74500	Training & Workshops	17,500	1,000	1,000	2,000	-	21,500
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					18,500	1,200	1,200	2,600	1,950,000	1,973,500
Output 2.6: RAC Efficiency Standards	FECO	GEF	71200	International Consultants	9,400	-	9,400	-	-	18,800
	FECO	GEF	71300	National Consultants	400	400	400	400	1,900	3,500
	FECO	GEF	72100	Contractual Services	16,000	16,000	16,000	16,000	16,000	80,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					25,800	16,400	25,800	16,400	17,900	102,300
Output 2.7: Compilation of RAC Market and	FECO	GEF	71200	International Consultants	-	-	-	-	-	-
	FECO	GEF	71300	National Consultants	1,000	-	-	-	-	1,000
	FECO	GEF	72100	Contractual Services	20,000	15,000	15,000	15,000	15,000	80,000

Component	Responsible Agency	Source	Budget Code	Description	Annual Expenses (US\$)					Total Cost (US\$)
					Year 1	Year 2	Year 3	Year 4	Year 5	
Performance Information	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					21,000	15,000	15,000	15,000	15,000	81,000
Output 2.8: Completed EE RAC Product Testing	FECO	GEF	71200	International Consultants	-	-	-	-	-	-
	FECO	GEF	71300	National Consultants	1,000	-	-	-	-	1,000
	FECO	GEF	72100	Contractual Services	45,000	30,000	30,000	35,000	35,000	175,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
FECO	GEF	71600	Travel	-	-	-	-	-	-	
<i>Sub-total</i>					46,000	30,000	30,000	35,000	35,000	176,000
Output 2.9: Policy Recommendations and Information, Education and Communication Materials on Addressing ODS Refrigerant Replacement and Disposal	FECO	GEF	71200	International Consultants	-	1,500	1,000	-	-	2,500
	FECO	GEF	71300	National Consultants	-	1,600	400	-	-	2,000
	FECO	GEF	72100	Contractual Services	-	25,000	5,000	-	-	30,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
FECO	GEF	71600	Travel	-	-	-	-	-	-	
<i>Sub-total</i>					-	28,100	6,400	-	-	34,500
Component 2 TOTAL					192,350	260,500	447,400	536,100	2,017,900	3,454,250
Component 3: Energy Efficient RAC Promotion										
Output 3.1: High Efficiency RAC Procurement Guide and Procurement Promotion	FECO	GEF	71200	International Consultants	-	-	-	-	-	-
	FECO	GEF	71300	National Consultants	-	-	-	2,500	-	2,500
	FECO	GEF	72100	Contractual Services	-	-	-	25,000	-	25,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
FECO	GEF	71600	Travel	-	-	-	-	-	-	
<i>Sub-total</i>					-	-	-	27,500	-	27,500
Output 3.2: RAC Retailer Program	FECO	GEF	71200	International Consultants	-	-	-	-	-	-
	FECO	GEF	71300	National Consultants	-	-	-	1,000	1,500	2,500
	FECO	GEF	72100	Contractual Services	-	-	-	50,000	100,000	150,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
FECO	GEF	71600	Travel	-	-	-	-	-	-	
<i>Sub-total</i>					-	-	-	51,000	101,500	152,500

Component	Responsible Agency	Source	Budget Code	Description	Annual Expenses (US\$)					Total Cost (US\$)
					Year 1	Year 2	Year 3	Year 4	Year 5	
Output 3.3: RAC Recycling/Rebate Program Design and Implementation	FECO	GEF	71200	International Consultants	-	-	-	-	-	-
	FECO	GEF	71300	National Consultants	-	-	-	1,000	1,500	2,500
	FECO	GEF	72100	Contractual Services	-	-	-	20,000	50,000	70,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					-	-	-	21,000	51,500	72,500
Output 3.4: Enhancement of the National EE Label for RACs	FECO	GEF	71200	International Consultants	-	-	-	9,400	9,400	18,800
	FECO	GEF	71300	National Consultants	-	-	-	400	2,100	2,500
	FECO	GEF	72100	Contractual Services	-	-	-	25,000	25,000	50,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					-	-	-	34,800	36,500	71,300
Output 3.5: Completed Consumer Education Campaign	FECO	GEF	71200	International Consultants	-	-	-	3,000	3,000	6,000
	FECO	GEF	71300	National Consultants	-	-	-	400	2,100	2,500
	FECO	GEF	72100	Contractual Services	-	-	-	300,000	323,250	623,250
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					-	-	-	303,400	328,350	631,750
Output 3.6: Web-based Tools	FECO	GEF	71200	International Consultants	3,000	-	-	-	-	3,000
	FECO	GEF	71300	National Consultants	500	500	500	500	500	2,500
	FECO	GEF	72100	Contractual Services	40,000	15,000	15,000	15,000	15,000	100,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					43,500	15,500	15,500	15,500	15,500	105,500
Output 3.7: Completed EE RAC Public Relations Campaign	FECO	GEF	71200	International Consultants	-	-	-	-	9,400	9,400
	FECO	GEF	71300	National Consultants	200	200	200	200	200	1,000
	FECO	GEF	72100	Contractual Services	5,000	5,000	5,000	5,000	40,000	60,000
	FECO	GEF	74500	Training & Workshops	-	-	-	-	-	-
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					5,200	5,200	5,200	5,200	49,600	70,400
Output 3.8: RAC EE Policy Promotion	FECO	GEF	71200	International Consultants	-	-	16,850	-	-	16,850
	FECO	GEF	71300	National Consultants	-	1,000	1,000	-	-	2,000
	FECO	GEF	72100	Contractual Services	-	33,500	84,600	-	-	118,100
	FECO	GEF	74500	Training & Workshops	1,000	1,000	1,500	1,500	-	5,000

Component	Responsible Agency	Source	Budget Code	Description	Annual Expenses (US\$)					Total Cost (US\$)
					Year 1	Year 2	Year 3	Year 4	Year 5	
	FECO	GEF	71600	Travel	-	-	-	-	-	-
<i>Sub-total</i>					1,000	35,500	103,950	1,500	-	141,950
Component 3 TOTAL					48,700	45,200	128,150	463,400	587,950	1,273,400
Project Management & M&E										
Project Management	FECO	GEF	71300	National Consultants	72,000	72,000	72,000	72,000	72,000	360,000
	FECO	GEF	71600	Travel	8,960	8,960	8,960	8,960	3,960	39,800
	FECO	GEF	72100	Office Supplies	16,000	1,000	1,000	1,000	1,000	20,000
	FECO	GEF	74200	Printing and Translation	7,600	7,600	7,600	7,600	7,600	38,000
	FECO	GEF	71600	Materials and goods	850	850	850	850	850	4,250
	FECO	GEF	73100	Communications	400	400	400	400	400	2,000
	FECO	GEF	74500	Inception Workshop	36,950	-	-	-	-	36,950
Monitoring & Evaluation	FECO	GEF	74100	Financial Audit	3,000	3,000	3,000	3,000	3,000	15,000
	FECO	GEF	71300	National Consultants (MTR & FE)	-	-	3,900	-	5,850	9,750
	FECO	GEF	71200	Int'l Consultants (MTR & FE)	-	-	12,500	-	17,500	30,000
Project Management & M&E TOTAL					153,220	101,270	117,670	101,270	142,870	616,300
GRAND TOTAL					579,270	541,970	735,470	1,126,170	3,280,720	6,263,600

Summary of Funds

Source	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Amount Year 5	Total
GEF	579,270	541,970	735,470	1,126,170	3,280,720	\$ 6,263,600
Donor 2 (GOC – MOA) cash & in-kind	70,000	70,000	100,000	70,000	40,000	\$350,000
Donor 3 (RAC Manufacturers) cash & in-kind	2,100,000	2,100,000	4,200,000	6,300,000	6,300,000	\$21,000,000
TOTAL	2,749,270	2,711,970	5,035,470	7,496,170	9,620,720	\$ 27,613,600

SECTION IV: ADDITIONAL INFORMATION

PART I: Other Agreements (See attached)

- A. GEF Operational Focal Point Letter of Endorsements
- B. Co-Financing Letters

Attached separately

PART II: Stakeholder Involvement Plan

During the project development stage, several stakeholders were consulted through a survey, and round table discussions. The following are the major stakeholders of the PEERAC project and their expected role in the project:

Table 10. Role of Stakeholders

Institution	Mandate on EE and Role in PEERAC
Ministry of Environmental Protection	<ul style="list-style-type: none"> • National Executing Agency for PEERAC and Designated Implementing Partner of UNDP • Establishment and supervision of the PMO • Advise on environmental protection policies related to ODS refrigerants from recycled/disposed old RACs • Provision of project office space and logistics to project management team • Member of Project Advisory Committee and Review Committee
National Development and Reform Commission	<ul style="list-style-type: none"> • Advise on Energy Efficiency policy and strategies as applied to the energy using appliances • Member of Project Advisory Committee and Review Committee
Ministry of Industry and Information Technology	<ul style="list-style-type: none"> • Advise on industrial and information technology policy and strategies as applied to the energy using appliances • Coordination with “Home appliances going to the countryside” Program; “Replacement of household electrical appliance” Program • Member of Project Advisory Committee and Review Committee
Ministry of Finance	<ul style="list-style-type: none"> • National GEF Operational Focal Point • Coordination with “Home appliances going to the countryside” Program; “Replacement of household electrical appliance” Program”; Project of Energy Saving Products for the People" • Member of Project Advisory Committee
Ministry of Commerce	<ul style="list-style-type: none"> • Advise on RAC market • Coordination with “Home appliances going to the countryside” Program; “Replacement of household electrical appliance” Program • Member of Project Advisory Committee
China National Institute of Standardization	<ul style="list-style-type: none"> • Advise on RAC energy efficiency standards and labels • Coordination with the UNDP-GEF BRESL Project • Member of Project Review Committee • Potential subcontractor
China Household Electrical Appliances Association	<ul style="list-style-type: none"> • Advise on RAC industry and market development • Member of Project Review Committee • Potential subcontractor
China Household Electric Appliances Research Institute	<ul style="list-style-type: none"> • Advise on R&D activities of local RAC manufacturers • Member of Project Review Committee • Potential subcontractor
RAC and ACC Manufacturers	<ul style="list-style-type: none"> • Active participation in the project capacity development activities, technical assistance activities, and incentive programs
Building Practitioners	<ul style="list-style-type: none"> • Implementation of RAC application projects in line with existing building energy codes/standards
International Technical Assistance Organizations	<ul style="list-style-type: none"> • Design, organization and implementation of international training of ACC and RAC technical/design personnel

PART III: CO2 Emissions Reduction Estimates

Summary

The purpose of the PEERAC Project is the reduction of China's future GHG emissions through transformation of the Chinese room air conditioner (RAC) market to production and sale of more energy-efficient RACs. This will be realized through the removal of barriers to such market transformation. The CO₂ emission reductions will be realized from the utilization of the EE RACs that will be locally manufactured by consumers in the commercial and residential (C&R) sectors of China. The potential CO₂ emission reduction from the wide scale application of EE RACs in these sectors is about 579.2 million tons (cumulative during the PEERAC project implementation period ending in 2015).

Direct CO₂ Emissions Reductions

The PEERAC includes the implementation of activities intended to promote the local production of EE RACs and widespread EE RAC applications in the commercial & residential sectors of China. Among the activities are programs that will be designed to provide incentives to:

- (1) Consumers in the C&R sectors to buy EE RACs;
- (2) RAC manufacturers to produce EE RACs; and,
- (3) RAC retailers to market EE RACs.

From these programs, specific numbers of RAC units will be manufactured and sold, and the subsequent utilization of the sold RAC units will generate CO₂ emission reductions that can be attributed directly to the PEERAC Project.

Assumptions

The assumptions used in the estimation of CO₂ emissions reductions are as follows:

- About 20% of the total national energy consumption in China is accounted for by the commercial & residential (C&R) sector. Forecast is 20.2% to 20.6% during 2010-2025
- About 9.5% of the C&R sector energy consumption in 2010 will be used for air conditioning (based on ERI forecast). It is estimated that air conditioning demand in the C&R sector will account for the following percentages of the sectors energy consumption: (a) 11.8% by 2015; (b) 14.1% by 2020; and, (c) 16.4% by 2025.
- Ratio of AC Consumption in the C&R sector = 65/35 (commercial/residential)
- About 65% of the overall AC energy consumption in the C&R sector is accounted for by RACs
- Average size of 1 RAC unit = 1,200 W
- Baseline RAC EER (2009) = 2.67; Baseline average energy usage of RAC = 1,314 kWh/yr
- GEF Alternative RAC EER = 2.94; Alternative average energy usage of RAC = 1,212.4 kWh/yr (to be achieved by EOP)
- By EOP, baseline EER shifts to EER = 2.94
- EER = 3.81 (max. limit) to be achieved 10 years after EOP
- Corresponding average annual energy consumption for EER = 3.81: 920 kWh/yr
- Efficiency Increase: 2% during project; 3% after project (1% due to EE labels)
- Lifetime of a RAC Unit = 12 years
- NOTE: For China, the CO₂ emission factor for grid electricity is 1 kWh = 1.067 kg CO₂ = 0.402 kg coal = 0.000402 tce = 0.000000402 Mtce

Table 11. Direct Energy Savings During and After PEERAC Implementation

Program	EER	No. of RAC units	Annual Energy Savings, Mtce	CO2 Emission Reductions, ktons	
				Annual	Lifetime
Rebate Program	2.78	20,000	0.379	8.875	106.503
Manufacturers Program	2.83	100,000	2.626	61.449	737.387
Retailers Program	2.89	100,000	3.356	78.522	942.258
TOTAL		220,000	6.361	148.846	1,786.149

Direct Post Project Emission Reductions

So far, as per project design, there are no direct post project CO2 emission reductions that can be attributed to PEERAC. This is because there are no other programs similar to the 3 programs that will be implemented during the project that will be designed or be assisted in the design, for implementation after PEERAC.

Indirect CO₂ Reductions

There will be a significant amount of indirect CO₂ emissions reductions due to the PEERAC project. The indirect impacts are attributed to, but not limited to, the facilitation/creation of the following major conditions:

- Implementation of policies that are supportive of EE RAC manufacturing and widespread EE RAC applications expected to be approved or influenced to be approved by PEERAC
- Successful implementation of 3 programs that showcase potential ways of advocating and encouraging, and creating incentives for, the key players in the RAC industry and market, namely the: (1) RAC manufacturers; (2) RAC retailers; and, (3) Consumers.
- Enhanced knowledge and technical capacity of local ACC and RAC manufacturers to produce EE RACs both for the domestic and foreign markets
- Continued GOC commitment in promoting energy efficiency and climate change mitigation

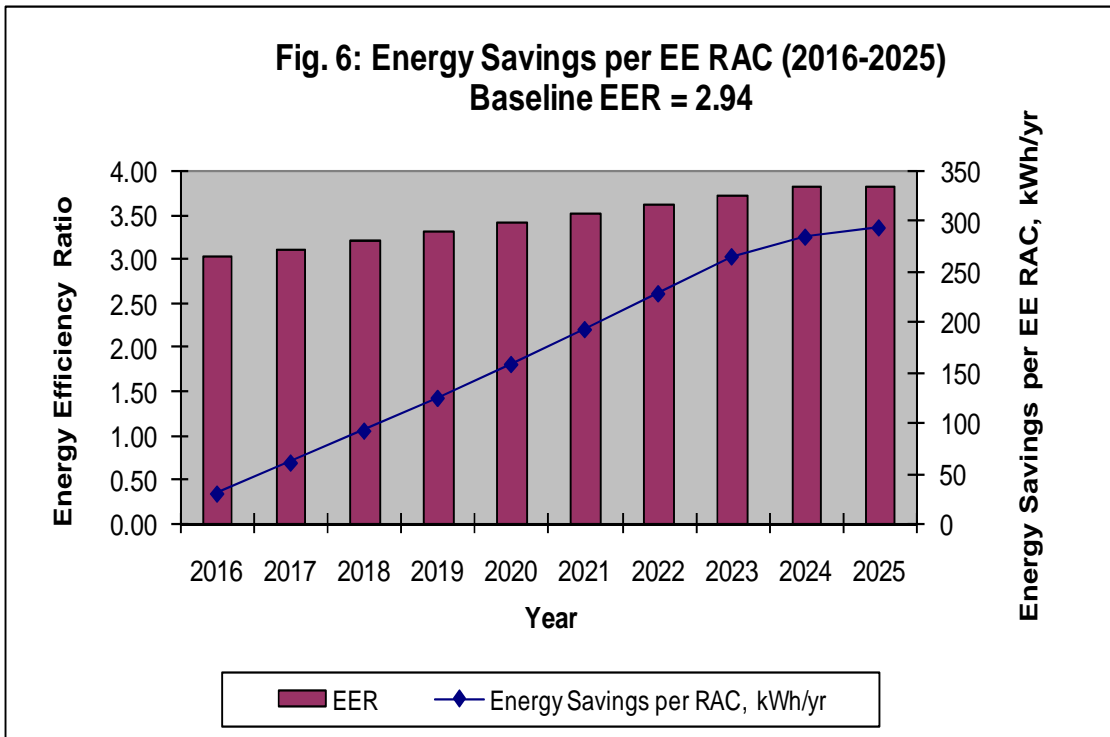
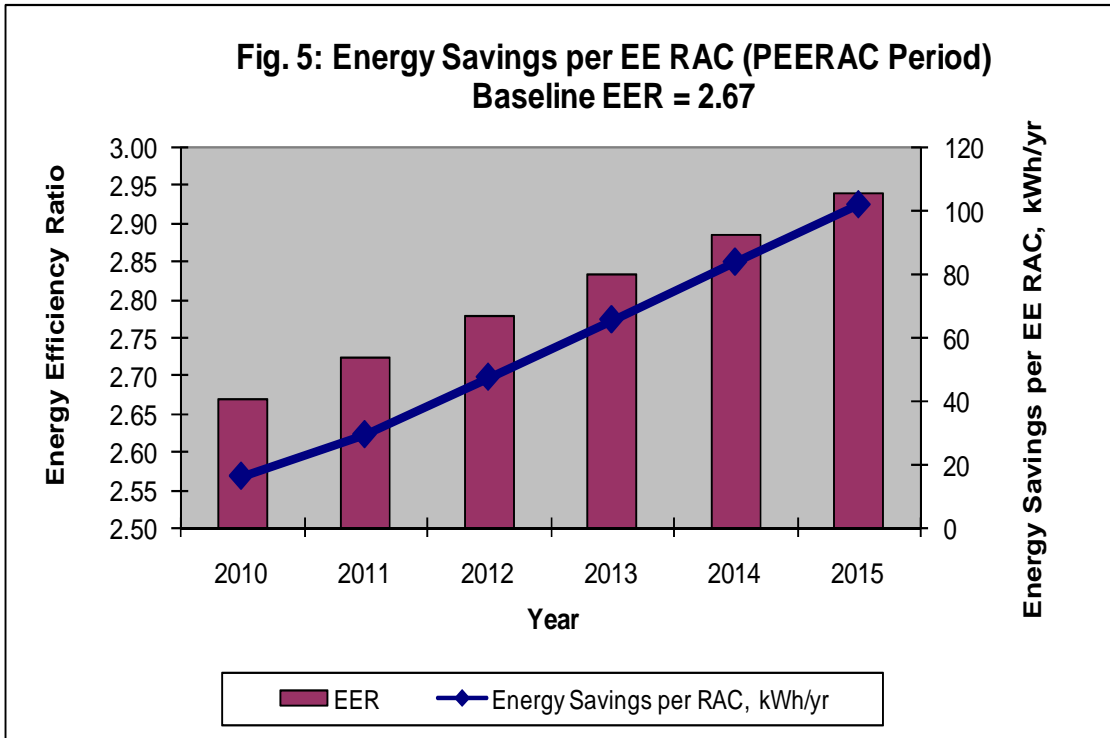
Considering the barrier removal activities that will be carried out under PEERAC, it is deemed that the GEF influence in achieving the abovementioned CO2 emission reductions during the influence period, which in this case is until 2025, would be high, relative to that during the project period. In that regard, some of the indirect CO2 reduction can be attributed partly to the interventions that will be carried out by PEERAC such as the capacity development programs, technical assistance activities; policy studies and formulation; and the successful implementation of the incentive schemes for RAC manufacturers and retailers and for the consumers.

Table 12 shows the forecast annual increase in EER of new locally manufactured EE RACs in China starting Year 2010:

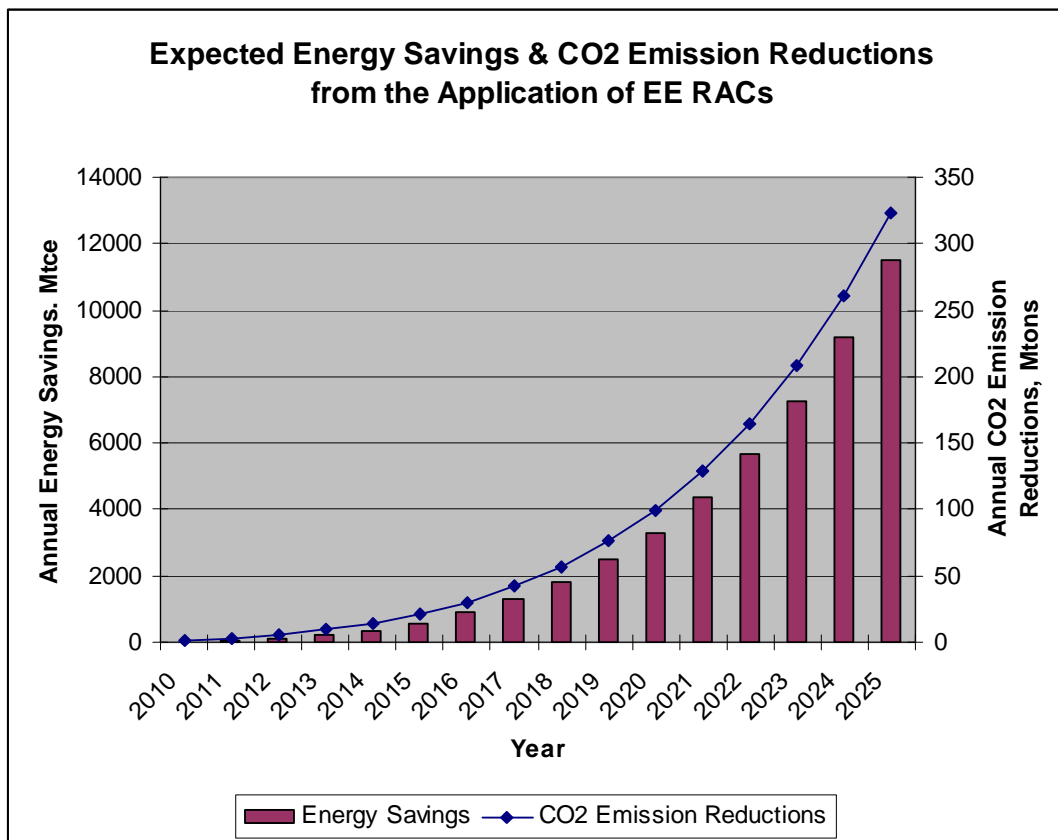
Table 12. Forecast Energy Efficiency Ratio of Locally Manufactured EE RACs

Year	EER	Year	EER	Year	EER	Year	EER
2010	2.67	2014	2.89	2018	3.21	2022	3.62
2011	2.72	2015	2.94	2019	3.31	2023	3.72
2012	2.78	2016	3.03	2020	3.41	2024	3.77
2013	2.83	2017	3.12	2021	3.51	2025	3.81

Fig. 5 & Fig. 6 show the expected annual energy savings from the application of RACs with improved EER during the PEERAC period and during the project influence period (2016-2025).



The following figure shows the forecast energy savings and corresponding CO2 emission reductions from the utilization of EE RACs in China C&R sector.



The estimated potential cumulative CO2 emission reduction during the influence period (10 years after the PEERAC project period) is about 1,117.4 Mtons. Although the expected impacts would be high, the PEERAC’s impacts can be conservatively estimated as 40% of the potential CO2 emission reductions based on the market and technology potential approach. Hence, using the Top-Down Approach and employing a GEF Causality Factor of 0.4 (modest and substantial), the indirect CO2 emission reduction is $1,117.4 * 0.4 = 446.9$ Mtons.

On the other hand, using a Bottom-Up approach, we consider a replication factor = 3 (based on market transformation) and applying this to the direct CO2 emission reductions, the indirect CO2 emission reduction is $1,786.15 * 3 = 5,258.45$ ktons.

Total CO₂ Emissions Reduction

Table 13. Summary of CO₂ Emissions Reduction Attributed to PEERAC

Particulars	Quantity (Mtons)	Remarks
Direct CO ₂	1.786	From utilization of EE RACs covered under incentive programs for manufacturers, retailers and consumers.
Direct Post-Project CO ₂	0	
Indirect CO ₂	5.2 – 446.9	Market transformation (RF = 3); GEF CF = 0.4

Part IV: Project Risks and Assumptions

While all efforts are made to ensure the effective design and implementation of the project activities, there are some risks that have to be addressed to ensure success of the project. The Project Planning Matrix (Sec II, Part II) shows a detailed overview of the project’s assumptions. The principal risks, which can potentially hinder the successful project implementation and/or reduce project effectiveness, are summarized in Table 13. The table also provides the level of risks and the suggested mitigation actions

:

Table 14. Summary of Risk Mitigation measures for the PEERAC

Risks	Risk Level	Mitigation Measures
Manufacturers unwilling to participate in training activities; adequate number/share of trainees remain employed in ACC and RAC industries to ensure sustainable impact	L	Training activities have been designed in order to maximize effectiveness and participant attractiveness through a combination of various training approaches, drawing on experience from the China Refrigerator Project; manufacturers will be encouraged to adopt team-based design approaches in order to minimize retention risks, and several individuals will receive training
Training activities inadequate to raise expertise levels enough to accomplish project goals	L	International technical training has been designed in conjunction with other training programs to ensure adequacy to support accomplishment of project goals
ACC & RAC manufacturers unwilling to cooperate	L	Compressor and RAC manufacturers will be required to engage in planning dialogues as a condition of full project participation; given that it is in ACC manufacturers' self interest to supply RAC manufacturers needs, most manufacturers are expected to participate in this activity (a few may chose to limit participation for confidentiality reasons)
ACC and RAC manufacturers unwilling to fully participate in TA activities	L	Training activities have been designed in order to maximize effectiveness and participant attractiveness through a combination of various training approaches; trainee retention not an issue since TA is provided on site and is therefore available to full engineering teams
ACC and RAC manufacturer finances inadequate to fund product commercialization; manufacturer ability and willingness to commercialize new products will be adversely affected by economic crisis	M	While GEF funds are limited, these will be leveraged by significant co-funding, commitment of which will be a condition of participation in the project; the project has been designed to provide adequate assistance, benefits, and incentives for manufacturers to develop and commercialize new EE products, irrespective of external economic conditions
Participating enterprises not willing to provide necessary data	L	Provision of data will be a requirement for participation in the project; since manufacturers consider some data confidential and proprietary, manufacturers will be assured that such data will be used for project purposes and only published in aggregate form without corporate identification, so as to prevent release of confidential business information
Manufacturers unwilling to provide test samples	L	Provision of test samples will be required for participation in the project
Delays in new standard implementation will delay or negate impact; changes in standard will be inadequate to meet project goals; new standard will not be enforced	L	Project will work closely with the agencies responsible for standard setting; other project activities will be coordinated with standard revision schedule in order to maximize impact; revised EE standards will be drafted to enhance enforcement and combined with EE product promotion and training to increase impact and improve enforcement potential.
Program discontinued after project completion	L	The program will be housed at an existing institution with related functions in order to leverage GEF resources and insure continuation after project completion

Risks	Risk Level	Mitigation Measures
Inadequate number of RAC manufacturers participate in the program; manufacturer ability and willingness to participate in project impacted by economic crisis	M	The program will be designed so as to maximize retailers' and purchasers' benefits and interest to participate
RAC retailers unwilling to participate	M	Program participation will be required for participation in the project; program resources will be targeted in order to achieve maximum cost-effective impact
Modified labeling program cannot be implemented; new labeling approaches do not increase EE purchases	L	Project leadership and advisory committees will include agencies responsible for the national EE label; other project activities will be coordinated with label revision in order to maximize impact
RAC manufacturers will not adequately support cooperative advertising program	L	RAC manufacturer commitment to cooperative advertising program will be a condition of participation in the project; given that manufacturers already spend significant amounts on advertising, project organizers believe that requiring them to allocate a portion of those funds to EE products is reasonable and achievable; the China Refrigerator Project made use of a similar requirement, which manufacturers were willing and able to commit to and achieve
Consumers will not find promotional/ informational materials useful; stakeholder cannot be identified with long-term interest in maintaining website after project completion	L	The program will be housed at an existing institution with related functions in order to leverage GEF resources and insure continuation after project completion
Media outlets will be unwilling to place project sponsored materials	L	Subcontractor with PR expertise will be selected to minimize non-placement risk; key government agency project sponsorship and inclusion in project advisory committee will further enhance media placement ability
Policy workshops and meetings inadequate to increase policy makers' awareness and prioritization of RAC energy efficiency	M	Specific advocacy and lobbying activities targeted at the relevant policy makers are among the activities of the project.

From the above table, the overall level of risk is Low. At the inception stage of PEERAC the project risks and assumptions will be reviewed, and where necessary additional project risks will be identified. In addition, also as part of the project inception activities, a detailed risk management strategy for project implementation will be prepared.

Part V: Monitoring & Evaluation Plan and Budget

Project success indicators will be monitored and reported on annually in Project Implementation Review (PIR) report. Results will be reported for activities completed in the report year as provided for and described in the Project Planning Matrix.

Monitoring Plan

The following table summarizes the monitoring plan for the key success indicators of PEERAC

Table 15. Monitoring Plan for PEERAC

Key Success Indicators	Target (EOP)	Means of Verification	Sampling Frequency	Location
Cumulative CO2 emission reductions from start of project to end-of-project (EOP) in million metric tons CO2 equivalent	35.4	RAC Market Reports; Project M&E Reports	Annually beginning in year 2	Information Center, PMO
Total EE savings from the use of new EE RACs(Mtce)	939.5	RAC Market Reports; Project M&E Reports	Annually beginning in year 2	Information Center, PMO
Average RAC energy efficiency gain, %	10%	RAC Industry reports; Project M&E Reports	Annually beginning in year 2	Information Center, PMO
Average AC compressor efficiency gain, %	10%	ACC Industry reports, Project M&E reports	Annually beginning in year 2	Information Center, PMO
Number of training activities conducted	10	Training Activity Reports	After each completed activity	PMO, Subcontractors
Number of technical assistance services to manufacturers	90	Technical Assistance Reports	After each completed activity	PMO, Subcontractors
Number of individuals trained	116	Training Activity Reports	After each completed activity	PMO, Subcontractors
% of trainees that rated the training activities as good/excellent	75	Training Activity Reports	After each completed activity	PMO, Subcontractors
Proportion of trainees still involved in RAC design/production at company and/or sector at EOP	75	Post-training Survey Report; Information in AMIS	End-of-Project	AMIS, PMO
EE ACC market share by EOP, %	15	AMIS Reports	Annually beginning in year 2	AMIS, PMO
Number of high efficiency RAC models provided incremental cost incentive funding by end 2015	12	Project Activity Reports	Year 2015	AMIS, PMO

Key Success Indicators	Target (EOP)	Means of Verification	Sampling Frequency	Location
Number of high efficiency compressor models provided incremental cost incentive funding by end 2013	3	Project Activity Reports	Year 2013	AMIS, PMO
% increase in minimum EER standards	10	Activity reports	Year 2015	AMIS, PMO
Number of high efficiency RACs sold through Retail incentive program	100,000	Project Activity Report	Year 2014	PMO, Subcontractors
Number of inefficient RACs retired, recycled, and replaced with new efficient ones through recycling program	20,000	Project Activity Report	Year 2015	PMO, Subcontractors
Awareness, recognition, and/or consumer use of label increased, %	10	Consumer survey	Year 2014	PMO, Subcontractors
Share of RAC advertising by manufacturers for high efficiency products, %	10	Ad tracking and verification reports	Year 2015	PMO, Subcontractors

The complete listing of Annual Targets is summarized in Annex 2.

Monitoring & Evaluation Budget

The following table summarizes the budget for the various monitoring & evaluation (M&E) activities that will be carried out to manage and gauge the effectiveness of the PEERAC implementation. The table also shows the parties responsible for each M&E activity and the time frame of each activity.

Table 16. M&E Budget for PEERAC Project

Type of M&E Activity	Responsible Parties	Budget US\$ ²²	Time Frame
Inception Workshop	<ul style="list-style-type: none"> ▪ UNDP CO ▪ FECO 	\$30,000	Within first three months of programme start up
Inception Report	<ul style="list-style-type: none"> ▪ PMO/FECO ▪ UNDP CO ▪ Consultants as needed 	\$2,000	Within two weeks after completion of Inception Workshop
AWP preparation	<ul style="list-style-type: none"> ▪ UNDP CO ▪ PMO/FECO 	\$3,000	Annually
Quarterly Review Meeting	<ul style="list-style-type: none"> ▪ UNDP CO ▪ PMO/FECO 	\$6,000	Quarterly
APR and PIR	<ul style="list-style-type: none"> ▪ PMO ▪ UNDP CO ▪ UNDP/GEF RCU 	Part of PM Budget	Annually
PAC Meetings	<ul style="list-style-type: none"> ▪ PMO 	\$10,000	Annually
Mid-term External Evaluation	<ul style="list-style-type: none"> ▪ PMO ▪ External Consultant ▪ Technical Consultant 	\$16,400	In early Year 3

²² Excluding PMO staff time

Type of M&E Activity	Responsible Parties	Budget US\$ ²²	Time Frame
Final External Evaluation	<ul style="list-style-type: none"> ▪ PMO ▪ External Evaluation Consultant ▪ Technical Consultant 	\$23,350	By end of Year 5
Terminal Workshop	<ul style="list-style-type: none"> ▪ PMO/FECO ▪ UNDP CO ▪ PAC ▪ UNDP/GEF RCU ▪ CTA 	\$20,000	By end of Year 5
Terminal Report	<ul style="list-style-type: none"> ▪ PMO ▪ External Consultant 	\$3,250	At least one month before the end of project
Financial Audit	<ul style="list-style-type: none"> ▪ CNAO 	\$15,000	Annually
On-site Evaluation	<ul style="list-style-type: none"> ▪ UNDP CO ▪ PMO ▪ PAC 	\$20,000	Annually
TOTAL INDICATIVE COST		US\$ 149,000	

Annex 1 Manufacturer Incentive Awards

Incentive Awards	Number of awards	Award amount	Total
RAC Manufacturer			
Basic awards -- first tier	3	100,000	300,000
Basic awards -- second tier	4	50,000	200,000
Basic awards -- third tier	10	25,000	250,000
Total Basic awards	17	44,118	750,000
EE product impact award # 1	1	250,000	250,000
EE product impact award # 2	2	100,000	200,000
EE product impact award # 3	3	50,000	150,000
Total efficiency award # 1	1	250,000	250,000
Total efficiency award # 2	2	100,000	200,000
Total efficiency award # 3	3	50,000	150,000
Subtotal competitive RAC awards	12	100,000	1,200,000
Total product awards	29	67,241	1,950,000
ACC Manufacturer			
Basic awards -- first tier	3	20,000	60,000
Basic awards -- second tier	3	10,000	30,000
Basic awards -- third tier	4	5,000	20,000
Total Basic awards	10	11,000	110,000
Principal award	1	250,000	250,000
Second place award	1	100,000	100,000
Third place award	1	50,000	50,000
Subtotal competitive awards	3	400,000	400,000
Total award pool	13	39,231	510,000
Rebate/Recycling Incentive			50,000
Total Incentive Programme			2,510,000

1. **Basic Awards:** These awards will be issued to both ACC and RAC manufacturers participating in the incentives program. Manufacturers receiving these awards must sign contracts with the PEERAC PMO to commit participation in all relevant project activities and requirements, such as developing at least one new EE model, improving average RAC production batch energy efficiency by at least 10%, and allocating at least 10% of their advertising budget to their EE products. These awards aim to incentivize and provide incremental cost funding for energy efficiency improvements in the production of RACs and ACCs. In order to manufacture EE products, manufacturers will implement new energy efficient product designs, and upgrade production technology and equipment. The costs for conducting these activities will be borne by participating manufacturers themselves. The Basic Awards will compensate their incremental cost for these activities.
2. **Competitive RAC Award:** This includes an EE product impact award and total efficiency award. The EE product impact award will be issued to the RAC manufacturer that produced the most number of EE RAC models with the highest Energy Efficiency Ratio (EER). The total efficiency award will be issued to the RAC manufacturer that produced EE RAC models with most energy savings (savings per RAC multiplied by total domestic sales). These 2 awards will influence the optimization of both the energy efficiency rating and sales of EE

RACs. These awards will provide the manufacturers incentive to commercialize the EE RAC models.

3. **Competitive ACC Award**: A principal award, as well as second place and third place awards will be issued to the top 3 ACC manufacturers, respectively, that will produce the most number of EE ACC models with the highest Coefficient of Performance (COP).

Annex 2: PEERAC Project Annual Targets

Strategy	Indicator	Target	Year 1	Year 2	Year 3	Year 4	Year 5
Project Goal: Reduction of GHG emissions from room air conditioning in China's residential and commercial sectors	Cumulative CO2 emission reductions from start of project to end-of-project (EOP), Mtons CO ₂ eq	35.4	4.8	8.8	14.9	23.6	35.4
Project Objective: Significantly improved room air conditioner energy efficiency in China.	Average RAC energy efficiency gain by EOP, %	10	2	4	6	8	10
	Cumulative energy savings from the use of EE RACs by EOP, Mtce	939.5	37.1	137.6	307.4	566.2	939.5
Activity 1.1.1: <u>Capacity Needs Assessment of Local ACC Manufacturers</u>	Number of completed Assessment Reports by mid-Year 1	1	1				
Activity 1.1.2: <u>AC Compressor Technology Training Workshop Design and Implementation</u>	Number of training workshops designed, organized and conducted by end Year 2	2	1	1			
	Number of individuals trained by end Year 2	24	12	12			
Activity 1.1.3: <u>Evaluation of In-Country AC Compressor Technical Training</u>	Percentage of trainees that rated the training workshop training as good/excellent, %	75	75	75			
	Proportion of trainees still involved in ACC design/production at company and/or sector at EOP, %	75			75	75	75
Activity 1.2.1: <u>International AC Compressor Technology Training Course Design and Implementation</u>	Number of international training courses designed, organized and conducted by end Year 1	1	1				
	Number of individuals trained by end Year 1	8	8				
Activity 1.2.2: <u>Evaluation of International AC Compressor Technical Training</u>	Percentage of trainees that rated the training course as good/excellent,%	75	75				
	Proportion of trainees still involved in ACC design/production at company and/or sector at EOP, %	75		75	75	75	75

Strategy	Indicator	Target	Year 1	Year 2	Year 3	Year 4	Year 5
Activity 1.3.1: <u>Organization and Conduct of an ACC Manufacturer Dialogue and Product Planning Workshop</u>	Number of participating ACC & RAC manufacturers in workshop held by end Year 3	18			18		
Activity 1.3.2: <u>Coordination and Evaluation of Follow-up Manufacturer Dialogue</u>	Cumulative number of follow-up dialogue meeting held by EOP	5			1	2	2
	Average number of participating ACC & RAC manufacturers in each dialogue meeting	At least 2				At least 2	At least 2
	Number of EE RACs using new EE ACCs by end Year 4	At least 1				At least 1	
Activity 1.4.1: <u>Selection of Local ACC Manufacturers for TA Provision</u>	Number of ACC manufacturers selected for on-site TA activities by end year 1	6	6				
Activity 1.4.2: <u>ACC Manufacturing TA Program</u>	Cumulative number of design, manufacturing and technical services provided under the TA program in Year 2	30		30			
Activity 1.4.3: <u>Evaluation of ACC Manufacturing TA Program</u>	Percentage of manufacturers that rated the TA service they received as good/excellent by EOP, %	75					75
	Proportion of ACC manufacturers that received TA services producing EE ACC products by EOP, %	75		30	40	60	75
Activity 1.5.1: <u>Product Commercialization Contracting and Mobilization</u>	Sales-weighted percentage of ACC manufacturers signing participation contracts by end Year 1, %	50 - 60	55				
Activity 1.5.2: <u>Product Design Implementation</u>	Average AC compressor efficiency (COP) by EOP	2.94	2.72	2.78	2.83	2.89	2.94
Activity 1.5.3: <u>Selection of Product Commercialization Models</u>	Number of bids received for incentives on new EE ACCs developed (COP = 3.4 @ 20% EE gain)/ by end Year 3	6			6		
Activity 1.5.4: <u>Product</u>	EE ACC market share by EOP, %	15					15

Strategy	Indicator	Target	Year 1	Year 2	Year 3	Year 4	Year 5
<u>Commercialization Implementation</u>	Number of EE ACC models provided incentive funding (for incremental cost) by end Year 4	3				3	
Activity 1.5.5: <u>Monitoring and Review of the Product Commercialization Program</u>	Number of interested ACC manufacturers that are planning to produce or already producing the new EE ACC models by EOP	3				3	
Activity 1.6.1: <u>Air Conditioner Information System Design and Establishment</u>	Information System (AMIS) established by end Year 1	Year 2010	Year 2010				
Activity 1.6.2: <u>ACC Information Collection and Annual Reporting</u>	Average percentage of ACC manufacturers submitting reports annually to AMIS starting Year 1, %	100	100	100	100	100	100
	Percentage of ACC manufacturers that rated the AMIS as useful by EOP, %	80	80	80	80	80	80
Activity 1.7.1: <u>AC Compressor Testing Center Establishment</u>	Appliance testing facility selected and established as ACC Testing Center by end Year 1	Year 2010	Year 2010	On Operation	On Operation	On Operation	On Operation
Activity 1.7.2: <u>ACC Product Testing</u>	Number of ACC manufacturers that participated in product testing by EOP	100		20	40	75	100
Activity 1.7.3: <u>ACC Product Testing Results Reporting</u>	Percentage of manufacturers that rated the ACC Product Testing as useful & good/excellent by EOP, %	80		60	70	75	80
	Proportion of ACC manufacturers that made use of the product testing results in improving their EE ACC products by EOP, %	80		60	70	75	80
Activity 2.1.1: <u>International Room Air Conditioner Technology Training Course Design and Implementation</u>	Number of international training courses designed, organized and conducted by end Year 2	1		1			
Activity 2.1.2: <u>Evaluation of International Room Air</u>	Number of individuals trained by end Year 2	12		12			

Strategy	Indicator	Target	Year 1	Year 2	Year 3	Year 4	Year 5
<u>Conditioner Technical Training</u>	Percentage of trainees that rated the training course as good/excellent by EOP, %	75		75	75	75	75
	Proportion of trainees still involved in RAC design/production at company and/or sector at EOP, %	75		75	75	75	75
Activity 2.2.1: <u>Capacity Needs Assessment of Local RAC Manufacturers</u>	Number of completed Assessment Reports by mid-Year 1	1	1				
Activity 2.2.2: <u>RAC Technology Training Workshop Design and Implementation</u>	Number of training workshops designed, organized and conducted by end Year 1	2	2				
	Number of individuals trained by end Year 2	48	24	24			
Activity 2.2.3: <u>Evaluation of In-Country RAC Technical Training</u>	Percentage of trainees that rated the training workshop training as good/excellent by EOP, %	75		75	75	75	75
	Proportion of trainees still involved in RAC design/production at company and/or sector at EOP, %	75		75	75	75	75
Activity 2.3.1: <u>Development of Intensive RAC Design Training Course</u>	A comprehensive intensive RAC design and manufacturing training course by end Year 2	Year 2011		Year 2011			
Activity 2.3.2: <u>Preparation of Initial RAC Prototypes/Models</u>	Number of EE RAC prototypes or models prepared by selected RAC manufacturers by Year 3	6			6		
Activity 2.3.3: <u>Conduct and Evaluation of the Intensive RAC Design Training Course</u>	Number of intensive training courses conducted by end Year 4	4				4	
	Number of manufacturers trained by end Year 4	6				6	
	Total number of individuals trained under this Output by end year 4	24				24	
	Percentage of trainees that rated the training course as good/excellent by EOP, %	75				75	75

Strategy	Indicator	Target	Year 1	Year 2	Year 3	Year 4	Year 5
	Proportion of trainees still involved in RAC design/production at company and/or sector at EOP, %	75				75	75
Activity 2.4.1: <u>Selection of Local RAC Manufacturers for TA Provision</u>	Number of RAC manufacturers selected for on-site TA activities by end year 1	12	12				
Activity 2.4.2: <u>RAC Manufacturing TA Program</u>	Number of design, manufacturing and technical services provided under the TA program by Year 4	60				60	
Activity 2.4.3: <u>Evaluation of RAC Manufacturing TA Program</u>	Percentage of manufacturers that rated the TA service they received as good/excellent by EOP, %	75			75	75	75
	Proportion of RAC manufacturers that received TA services producing EE RAC products by EOP, %	75			75	75	75
Activity 2.5.1: <u>Product Commercialization Contracting and Mobilization</u>	Sales-weighted percentage of RAC manufacturers signing participation contracts by end Year 1, %	75	75				
Activity 2.5.2: <u>Product Design Implementation</u>	Average RAC (EER) by EOP	2.94	2.72	2.78	2.83	2.89	2.94
Activity 2.5.3: <u>Selection of Product Commercialization Models</u>	Number of bids received for incentives on new EE RACs developed (EER = 2.944 @ 10% EE gain)/ by end Year 4	12				12	
Activity 2.5.4: <u>Product Commercialization Implementation</u>	EE RAC market share by EOP, %	15	6	7	91	11	15
	Number of EE RAC models provided incentive funding (for incremental cost) by end Year 4	12				12	
Activity 2.5.5: <u>Monitoring and Review of the Product Commercialization Program</u>	Number of interested RAC manufacturers that are planning to produce or already producing the new EE RAC models by EOP	12				10	12
Activity 2.6.1: <u>Development of RAC Energy Performance Standards</u>	Proposed standards for new minimum EER for RACs by mid Year 4	Year 2013			Year 2013		

Strategy	Indicator	Target	Year 1	Year 2	Year 3	Year 4	Year 5
Activity 2.6.2: <u>Revision of Current RAC Energy Performance Standards</u>	Number of comments and recommendations considered for the revision of EER Standards by end Year 4	At least 2				At least 2	
Activity 2.6.3: <u>Formal & Informal Discussions on Revised Standards</u>	Number of provisions in EER standards for approval by GOC policymakers by end Year 4	At least 1				At least 1	
Activity 2.6.4: <u>Publication and Capacity Building on the Revised Standards Compliance</u>	Published new standards on minimum EER of RACs	Year 2014				Year 2014	
	% of RAC manufacturers that indicated they can comply with the new set min EER standards by EOP, %	100				100	100
	% of RAC manufacturers that received advice on how to comply with new set minimum EER standards by EOP, %	25					25
Activity 2.6.5: <u>Evaluation of the Impacts of the Revised Standards Enforcement</u>	Market share of EE RACs by EOP	15	6	7	9	11	15
Activity 2.7.1: <u>Definition of RAC Information for Inclusion in AMIS</u>	Information System (AMIS) established by end Year 1	Year 2010	Year 2010				
Activity 2.7.2: <u>RAC Information Collection and Annual Reporting</u>	Percentage of RAC manufacturers submitting reports each year to AMIS starting Year 1, %	100	50	60	70	90	100
	Percentage of RAC manufacturers that rated the AMIS as useful by EOP, %	80	50	60	70	80	80
Activity 2.8.1: <u>Room Air Conditioner Testing Center Establishment</u>	Appliance testing facility selected and established as RAC Testing Center by end Year 1	Year 2010	Year 2010				
Activity 2.8.2: <u>RAC Product Testings</u>	Number of RAC manufacturers that participated in product testing by EOP	100	50	60	70	90	100
Activity 2.8.3: <u>RAC Product Testing Results Reporting</u>	Percentage of manufacturers rating the RAC Product Testing as useful and good/excellent by EOP, %	80	50	60	70	80	80

Strategy	Indicator	Target	Year 1	Year 2	Year 3	Year 4	Year 5
	Proportion of RAC manufacturers that made use of the product testing results in improving their EE RAC products by EOP, %	80	50	60	70	80	80
Activity 2.9.1: <u>Formulation of Policy Recommendations on Proper ODS Refrigerant Management and Disposal</u>	Completed satisfactory acceptable policy study on the most cost-effective approach for managing the old refrigerants from old RACs	Year 2011	Year 2011				
	Proposed national policy and set of guidelines for the management and disposal/destruction of the ODS refrigerants	Year 2012		Year 2012			
	Number of advocacy/lobbying activities completed each year starting Year 3				2	2	1
Activity 2.9.2: <u>Development of Information, Education and Communication Materials on ODS Refrigerant Management and Disposal</u>	Completed and published guidebook on managing and disposal of ODS containing old RACs and other refrigeration appliances/equipment	Year 2012		Year 2012			
	Number of ACC/RAC manufacturers, refrigerant traders and suppliers that committed to use the guidebook in their action plans to address the ODS refrigerant issues by EOP, %	At least 50		30	40	45	50
Activity 3.1.1: <u>Review of Typical Corporate RAC Procurement Procedures</u>	Completed survey/review report on typical corporate RAC procurement procedures/practices	Year 2013			Year 2013		
Activity 3.1.2: <u>Formulation of RAC Procurement Guidelines</u>	A procurement guide for RACs with standardized information for group procurement of EE RACs	Year 2014				Year 2014	
	Number of organizations receiving procurement guides by EOP	100				50	100
Activity 3.1.3: <u>Promotion of the Application of the RAC Procurement Guidelines</u>	Number of organizations that either have committed or have carried out actions, to procure EE RACs by EOP	At least 50				25	25

Strategy	Indicator	Target	Year 1	Year 2	Year 3	Year 4	Year 5
Activity 3.1.4: <u>EE RAC Procurement Guidelines Effectiveness Evaluation</u>	Number of organizations finding the RAC procurement guides useful by EOP	At least 75				50	75
Activity 3.2.1: <u>Capacity Needs Assessment of Local RAC Retailers</u>	Number of completed Assessment Reports by mid-Year 4	1				1	
Activity 3.2.2: <u>RAC Retailer Training Workshop Design and Implementation</u>	Number of retailers that received training and informational materials by end Year 4	50				50	
Activity 3.2.3: <u>Conduct of In-Store Marketing of EE RAC</u>	Number of retailers that implemented in-store marketing using received promotional materials by end Year 5	1,000					1,000
Activity 3.2.4: <u>Retail Incentive Program Design and Implementation</u>	Number of EE RACs that were sold under the Retail Incentive Program by EOP	100,000					100,000
Activity 3.2.5: <u>Evaluation of the RAC Retailer Program</u>	Number of RAC manufacturers by EOP that find the RAC Retailer Program useful for promoting EE RACs, and committed to strategically employ it after PEERAC	8					8
	Percentage of RAC retailers by EOP that find the RAC Retailer Program useful for promoting EE RACs	70					70
	Percentage of consumers that find the RAC Retailer Program useful for promoting EE RACs by EOP	70					70
Activity 3.3.1: <u>Conduct of RAC Rebate Program Workshop</u>	Number of RAC manufacturers that committed to develop and implement a rebate/recycling program by end Year 3	12			12		
Activity 3.3.2: <u>RAC Rebate Program Design</u>	Number of rebate/recycling program plans submitted to PEERAC by end Year 4	12				12	
	Number of rebate/recycling program plans approved by the PEERAC PAC by end Year 4	12				12	

Strategy	Indicator	Target	Year 1	Year 2	Year 3	Year 4	Year 5
Activity 3.3.3: <u>RAC Rebate Program Implementation</u>	Total number of inefficient RACs retired, recycled, and replaced with new efficient ones through the approved rebate/recycling programs by end Year 5	20,000					20,000
Activity 3.3.4: <u>RAC Rebate Program Evaluation and Incentive Award Issuance</u>	Percentage of total number of EE RACs sold under the program accounted for by the top 3 RAC manufacturers by end Year 5	At least 50					50
	Number of RAC manufacturers by EOP that find the RAC Rebate/Recycling Program useful for promoting EE RACs, and committed to strategically employ it after PEERAC	8					8
	Percentage of RAC retailers by EOP that find the RAC Rebate/Recycling Program useful for promoting EE RACs	70					70
	Percentage of consumers that find the RAC Rebate/Recycling Program useful for promoting EE RACs by EOP	70					70
Activity 3.4.1: <u>Review of RAC Labeling System</u>	Completed review of existing RAC energy labeling system by end Year 4	Year 2013				Year 2013	
Activity 3.4.2: <u>Modification of the RAC Energy Labeling Program</u>	Percentage of provisions in the existing RAC labeling program that were modified in the new approved program by end Year 4, %	25				25	
Activity 3.4.3: <u>Planning and Promotion of the RAC Energy Labeling Program</u>	Number of promotional workshops conducted by Year 4	2				2	
Activity 3.4.4: <u>Implementation of the RAC Energy Labeling Program</u>	% of RAC brands that qualify for the new EE RAC energy label by EOP, %	10				5	10
Activity 3.4.5: <u>Evaluation of the Modified RAC Energy Labeling Program</u>	EE RAC market share by EOP, %	15	6	7	9	11	15

Strategy	Indicator	Target	Year 1	Year 2	Year 3	Year 4	Year 5
Activity 3.5.1: <u>Survey on Level of Consumer Awareness about EE RACs</u>	Completed consumer awareness survey by mid-Year 3	Year 2012		Year 2012			
Activity 3.5.2: <u>Development of a Consumer Education Program</u>	Number of consumer education programs developed by end Year 3	1+			1	1	1
Activity 3.5.3: <u>Implementation of the Consumer Education Program</u>	Number of completed consumer education events by EOP	5				2	3
Activity 3.5.4: <u>Implementation of Cooperative Advertising Campaign with Manufacturers</u>	Number of advertisement templates/materials developed by end Year 3	2+			2+		
	US\$ value (million) of EE RAC project related advertising placed by manufacturers by end Year 5	7.5					7.5
Activity 3.5.5: <u>Evaluation of the Consumer Education Program</u>	Share of RAC advertising by manufacturers for high efficiency products by EOP, %	10			5	10	10
Activity 3.5.6: <u>Development of a Sustainable Continuing Education Program</u>	EE RAC market share by EOP, %	15	6	7	9	11	15
	% Increase in number of consumers that are either planning or are ready to purchase EE RAC by EOP	10					10
Activity 3.6.1: <u>Website Design, Implementation and Maintenance</u>	Designed website including, website materials and operational plan by Year 1	Year 2010	Year 2010				
	No. of officially established access to other related domestic and foreign-based websites/databases by EOP	At least 5		1		2	2
Activity 3.6.2: <u>Development of Web-based Tools</u>	Total number of users of web-based tools by EOP	100,000	5,000	15,000	20,000	30,000	30,000
Activity 3.6.3: <u>Promotion and Launching of the Website</u>	Officially launched and operational website by end Year 1		Year 2010				

Strategy	Indicator	Target	Year 1	Year 2	Year 3	Year 4	Year 5
Activity 3.6.4: <u>Evaluation of the Website Performance</u>	Total number of page views and/or downloads by EOP	350,000	17,000	53,000	70,000	70,000	140,000
	Total number of RAC purchase decisions affected by EOP	10,000	500	1,500	2,000	2,000	4,000
	% of website users each year that are satisfied with information downloaded starting Year 2, %	50		50	50	50	50
	% share of participating RAC manufacturers that link to website for cross-promotion by EOP, %	50		50	50	50	50
	Number of new informational and promotional products available each year in website starting Year 2	12		12	12	12	12
Activity 3.7.1: <u>Preparation and Publication of Articles on EE RAC</u>	Number of articles on EE RACs published throughout the project duration by EOP	60		10	15	15	20
Activity 3.7.2: <u>Presentation of PR Campaign Achievements</u>	% of cumulative EE RAC sales that were directly influenced by the PR campaigns by EOP, %	25					25
Activity 3.8.1: <u>Conduct of EE Air Conditioning Policy Studies</u>	Number of completed satisfactorily acceptable policy studies by EOP	At least 2					2
Activity 3.8.2: <u>Organization and Conduct of EE Air Conditioning Policy Workshop</u>	Number of EE air conditioning policy materials prepared, presented and disseminated to GOC policy makers by Year 2	At least 2		2			
Activity 3.8.3: <u>Conduct of International Policy Exchange</u>	Number of policies from other countries that were considered for the improvement of existing EE policies by end Year 3	At least 2			2		
Activity 3.8.4: <u>Conduct of an International ODS Workshop</u>	Number of policies on ODS refrigerant management (including implementing rules & guidelines) from other countries considered in the formulation of ODS management policy recommendations in China by Year 4	3			3		

Strategy	Indicator	Target	Year 1	Year 2	Year 3	Year 4	Year 5
Activity 3.8.5: <u>Conduct of Targeted Policy Coordination Meetings</u>	Cumulative number of targeted policy coordination meetings conducted by EOP	10	2	2	2	2	2
	Number of EE air conditioning & ODS refrigerant management policy recommendations accepted for consideration of approval by the relevant GOC authorities by EOP	At least 2					2

