GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

Naoko Ishii
CEO and Chairperson

September 28, 2015

Dear Council Member:

UNDP as the Implementing Agency for the project entitled: ***China: Promoting Energy Efficient Electric Motors in Chinese Industries***, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with UNDP procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by Council in November 2013 and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by UNDP satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at www.TheGEF.org. If you do not have access to the Web, you may request the local field office of UNDP or the World Bank to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

Naoko Ishii

Attachment: GEFSEC Project Review Document
Copy to: Country Operational Focal Point, GEF Agencies, STAP, Trustee

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REQUEST FOR CEO ENDORSEMENT

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

For more information about GEF, visit TheGEF.org

PART I: PROJECT INFORMATION

Project Title: PROMOTING ENERGY EFFICIENT ELECTRIC MOTORS IN CHINESE INDUSTRIES (PREMCI)			
Country(ies):	People's Republic of China	GEF Project ID:[1]	5360
GEF Agency(ies):	UNDP	GEF Agency Project ID:	PIMS 5121
Other Executing Partner(s):	Ministry of Industry and Information Technology (MIIT)	Submission Date: Resubmission Date:	21 April 2015 2 September 2015
GEF Focal Area (s):	Climate Change	Project Duration(Months)	48
Name of Parent Program (if applicable): ➢ For SFM/REDD+ ☐ ➢ For SGP ☐ ➢ For PPP ☐	N.A.	Project Agency Fee ($):	332,500

A. FOCAL AREA STRATEGY FRAMEWORK[2]

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount ($)	Co-financing ($)
CCM-2	Outcome 2.1: Appropriate policy, legal and regulatory frameworks adopted and enforced	Output 2.1: Energy efficiency policy and regulation in place	GEF TF	2,850,000	14,400,000
	Outcome 2.2: Sustainable financing and delivery mechanisms established and operational	Output 2.2: Investment mobilized Output 2.3: Energy savings achieved	GEF TF	650,000	3,000,000
		Total Project Costs		3,500,000	17,400,000

B. PROJECT FRAMEWORK

Project Objective: Increased manufacturing and widespread application of energy efficient electric motors in China						
Project Component	**Grant Type**	**Expected Outcomes**	**Expected Outputs**	**Trust Fund**	**Grant Amount ($)**	**Confirmed Co-financing ($)**
Component 1: Policy and Regulatory Frameworks on the Production	TA	Enhanced and clearly defined policy enforcement mechanisms on the production	1.1: Completed survey of the local electric motor market in China 1.2: Completed review of existing policies and regulations	GEF TF	800,000	1,900,000

[1] Project ID number will be assigned by GEFSEC.
[2] Refer to the Focal Area Results Framework and LDCF/SCCF Framework when completing Table A.

and Application of EE Motors		EE motors and their applications in the Chinese industrial sector	applicable to EE motors applications in industries in China 1.3: Recommended policies and implementing rules and regulations on EE motors production and their application in the Chinese industries taking into consideration all the past and ongoing programs in China and many other global experiences 1.4: Recommended policies and implementing rules and regulations on the development and support of the local EMR industry 1.5: Recommended policies and implementing rules and regulations for the phasing out (including appropriate support measures) of existing low efficiency electric motors 1.6: Established recommended system for EE system performance standards, testing protocol, and certification system 1.7: Enforced implementing rules and mechanisms for the approved policies & regulations on EE electric motors production and application. 1.8: Established M&E and improvement system on the enforcement of the approved policies and regulations on EE motors production and application. 1.9: Investment plans for EE motor production by new local electric motor manufacturers who were motivated and influenced by the enforced policies and regulations.			
Component 2: EE Motors Production and Applications	TA	Increased local production of EE motors for applications in Chinese industries	2.1: Successfully completed/ implemented technical assistance provided on local production of EE motors 2.1.1 Adopted capacity development program for local EE motor (HEM and REM) manufacturers 2.1.2: Completed training courses for local electric motor manufacturers on the design and manufacturing of EE motors (HEMs and REMs)	GEF TF	1,903,330	11,957,000

			2.1.3 Disseminated information on improved EE motor product design and production 2.2: Institutional development in increasing production of EE Motors 2.2.1: Established and operational EE motor research center and EE motor industry association 2.2.2: Completed demonstration of improved EE motor product design and manufacturing 2.2.3: Commercialized REM 2.2.4: Established and enforced EE motors application system testing and certification system.			
Component 3: Financial Support & Accessibility Improvement	Inv	Increased application of domestically produced EE Motors (HEMs and REMs) in Chinese industries	3.1: Completed techno-economic feasibility assessment and recommended action plan for financing improved EE motor initiatives of local electric motor manufacturers and suppliers 3.2: Developed and implemented action plan for financing improved EE motor initiatives of local electric motor manufacturers and suppliers 3.3: Developed and implemented suitable business models for local financial institutions to support EE motor production and application 3.4: Operational appropriate EE motor incentive mechanism	GEF TF	330,000	1,500,000
Component 4: EE Motors Promotion	TA	Increased market share of energy efficient electric motors	4.1: Established and operational electric motor market monitoring system 4.2: Regularly disseminated publication of local EE motors market and product performance information 4.3. Established guidelines on government procurement for EE motor (HEM &REM) 4.4. Operational EE motor (HEM and REM) manufacturer incentive program 4.5. Completed industrial consumer education campaigns on EE motor (HEM and REM) applications 4.6. Sustainable follow-up plan for the replication of the project interventions in collaboration with electric motor manufacturers in other Chinese cities	GEF TF	300,000	1,500,000

Sub-total		3,333,330	16,857,000
Project Management Cost (PMC)[3]	GEF TF	166,670	843,000
Total Project Costs		3,500,000	17,700,000

C. SOURCES OF CONFIRMED CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME ($)

Sources of Co-financing	Name of Co-financier (Source)	Type of Co-financing	Co-Financing Amount ($)
National Government	Ministry of Industry and Information Technology	Cash	1,900,000
National Government	Ministry of Industry and Information Technology	In-kind	1,000,000
Local Government	Shandong Provincial Government	Cash	1,900,000
Local Government	Shandong Provincial Government	In-kind	1,300,000
Local Government	Hunan Provincial Government	Cash	1,900,000
Local Government	Hunan Provincial Government	In-kind	1,200,000
Local Government	Shanghai Municipal Government	Cash	2,800,000
Local Government	Shanghai Municipal Government	In-kind	1,000,000
Local Government	Anhui Provincial Government	Cash	3,400,000
Local Government	Anhui Provincial Government	In-kind	1,000,000
GEF Agency	UNDP	Cash	300,000
Total Co-financing			17,700,000

D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY[1]: N. A.

[1]In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	Grant Amount ($)	Co-financing ($)	Project Total, ($)
International Consultants	439,000	1,996,000	2,435,000
National/Local Consultants	237,000	2,970,000	3,207,000

F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? No

(If non-grant instruments are used, provide in Annex D an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/NPIF Trust Fund).

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF[4]

The project conceptual design as presented in the GEF-approved PIF remains the same, except some minor changes/modifications that are presented and justified in the table below:

Expected Outputs		Rationale for Changes in PIF Outputs/Activities in the ProDoc
GEF-Approved PIF	Project Document	
Outcome 1: *Outputs:*	*Outcome 1:* *Outputs:*	

[3] PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

[4] For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter "NA" after the respective question.

Expected Outputs		Rationale for Changes in PIF Outputs/Activities in the ProDoc
GEF-Approved PIF	**Project Document**	
1.6. Enforced implementing rules and mechanisms for the approved policies & regulations on EE Motors production and application	1.6: Established recommended system for EE system performance standards, testing protocol, and certification system 1.7: Enforced implementing rules and mechanisms for the approved policies & regulations on EE electric motors production and application 1.8: Established M&E and improvement system on the enforcement of the approved policies and regulations on EE motors production and application 1.9: Investment plans for EE motor production by new local electric motor manufacturers who were motivated and influenced by the enforced policies and regulations	*As suggested during stakeholder consultation, expanded Output 1.6 in the PIF into essential elements of the implementation and enforcement of policies, rules and mechanisms covering necessary areas of EE motor standard requirements and M&E (Outputs 1.6, 1.7 and 1.8) and added another output on resultant investment plans (Output 1.9) to ensure that the outcomes of adopted policies are in place, monitored and evaluated for continuing improvement towards achievement of objectives.*
Outcome 2: *Outputs:*	*Outcome 2*: *Outputs:*	
	2.1: Successfully completed/ implemented technical assistance provided on local production of EE motors	*Same, just distinguished two (2) types of outputs: technical assistance and institutional development*
2.1.1.Developed capacity development program for local EE motor (HEM and REM) manufacturers;	2.1.1 Adopted capacity development program for local EE motor (HEM and REM) manufacturers	*Emphasized on the need for the government to adopt the capacity development program*
	2.2: Institutional development in increasing production of EE Motors	*Same reason as in 2.1 regarding the two types of outputs where Output 2.2 refers to investment support in establishing the institutions necessary for production and commercial application of HEMs and REMs.*
2.2.3. Commercialization of REM products	2.2.3 Commercialized REM	*Restated in output form*
Outcome 3: *Outputs:*	*Outcome 3:* *Outputs:*	
3.1. Completed techno-economic feasibility assessment and action plan for financing improved EE motor initiatives of local electric motor manufacturers and suppliers	3.1: Completed techno-economic feasibility assessment and recommended action plan for financing improved EE motor initiatives of local electric motor manufacturers and suppliers	*Reworded for clarity and separated the implementation of the action plan*
3.2. Developed and implemented new business models for local financial institutions to support EE motor manufacturing	3.2: Developed and implemented action plan for financing improved EE motor initiatives of local electric motor manufacturers and suppliers	*Reworded for clarity to have suitable models*

Expected Outputs		Rationale for Changes in PIF Outputs/Activities in the ProDoc
GEF-Approved PIF	Project Document	
3.3. Operational EE motor rebate program for electric motor users	3.3: Developed and implemented suitable business models for local financial institutions to support EE motor production and application 3.4: Operational appropriate EE motor incentive mechanism	*Opened the possibility of other incentives aside from rebates as a result of the feasibility assessment.* *Added Output 3.4 to ensure that the appropriate incentive models and financial mechanisms that are adopted are made operational and more accessible.*

A.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc. N.A.

A.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities. N.A.

A.3 The GEF Agency's comparative advantage: N.A.

A.4. The baseline project and the problem that it seeks to address:

The Chinese government had in the past implemented, and is currently implementing, several energy efficiency improvement programs focused on electric motors. These include the optimization of electric motor systems and the application of variable speed control in motor systems in the industry sector. However, there are very limited GOC-led interventions for improving the energy efficiency for locally made electric motors. Apart from the previous projects funded by organizations such as the Energy Foundation and UNIDO, most of the activities in this area are from the private sector, e.g., the International Copper Association. R&D in the area of EE electric motors is currently limited to individual efforts of electric motor manufacturers and the application of advanced technologies are constrained by lack of investment due to inadequate support and enforced policies that could spur interest and confidence of investors and in particular the industrial users of electric motors. The current China Motor Energy Efficiency Improvement Program (CMEEIP)[5] involves various interventions that are intended to promote the development and widespread use of EE electric motors, which are the high efficiency motors (HEMs) and remanufactured electric motors (REMs). Most of these efforts by the government (through MIIT) on electric motors are for the electric motor users. So far, very few local electric motor manufacturers have shown interest in venturing to the production of EE motors (particularly HEMs). Converting existing standard electric motor production line for EE motor production is currently not economically feasible for the over 2,000 electric motor manufacturers in China. The other government programs on promoting the development and widespread utilization of EE electric motors are the (a) Electromechanical Products Remanufacturing Pilot Project (MIIT); and, (b) Fiscal Subsidy Program for HEMs Production (NDRC and

[5] The China Motor Energy Efficiency Improvement Program consists of the following sub-programs: (a) MIIT (China Motor Energy Efficiency Improving Program); (b) Shandong Provincial Government (EMR pilot program); (c) Hunan Provincial Government (EMR pilot program); (d) Shanghai Municipal Government (EE motor promotion and R&D); (e) Anhui Provincial Government (EMR pilot program); (f) MIIT (EE motor rebate scheme, REMs standards, REMs certification system); (g) Shandong Provincial Government (REMs manufacturing demonstration); (h) Hunan Provincial Government (REMs manufacturing demonstration); (i) Shanghai Municipal Government (REMs product R&D, EE motor rebate scheme, REMs research center, REMs testing facility); and, (j) Anhui Provincial Government (REMs manufacturing demonstration, REMs testing facility).

MOF). The MIIT's Electromechanical Products Remanufacturing Pilot Project that is implemented nationwide focuses on the remanufacturing of old electromechanical products and improving their efficiency. Under this project, the MIIT is currently supporting 3 electric motor companies in Anhui (*Anhui Wannan Electric Machine Co. Ltd);* Hunan *(Xiangtan Electric Manufacturing Co. Ltd); and,* Xian *(Xi'an SIMO Motor, Inc.*), and a research institution in electric motor remanufacturing (EMR)[6].

The following are some of the implementation highlights of the abovementioned initiatives of the government:

- Implementation by the Shanghai Municipal Government of the "Detailed plan of promoting the implementation of high-efficiency electric motor remanufacturing in Shanghai" in September 2012.
- Joint issuance by the MIIT and AQSIQ of the organization and implementation of the electric motor efficiency enhancement program in June 2013.
- MIIT and AQSIQ, in cooperation with motor manufacturers, carried out an EE standards and labeling activity to verify achievements made under the CMEEIP.
- Completion of a national catalog of advanced technology in electric motors in July 2014 (MIIT)
- Completion of a national electric motor energy efficiency improvement conference in December 2014 (MIIT).
- Completion of two national conferences on: (1) electric motor efficiency improvement (May 2014); and (2) electric energy technology promotion (July). These were organized by MIIT and the electric motor industry alliance)
- Completion of an international workshop on energy efficient electric motors in July.
- At the local level implementation of the CMEEIP, several initiatives towards the enforcement of electric motor system efficiency improvements have been accomplished in line with the national direction.

Bulk of the activities in the EMR field is still on research and development of EMR techniques. At present, the EMR production capacity and annual sales of REMs are still negligible compared to that of the standard electric motor manufacturing industry. In December 2014, under the Electromechanical Products Remanufacturing Pilot Project, MIIT issued a directive to further improve on the experience derived from the piloting of motor remanufacturing based on the first batch of remanufactured units from pre-identified 35 companies.

The NDRC and MOF implemented Fiscal Subsidy Program is still ongoing. NDRC and MOF have recently issued subsidy funds for additional six (6) batches of electric motor products. The new subsidies include that for energy-efficient small and medium 3-phase asynchronous motors (RMB 15-40/kW); for large 3-phase asynchronous motors (RMB 12/kW); and for 3-phase rare earth permanent magnet synchronous motors (RMB 40-60/kW).

While some progress have been made, this has been at best very modest. The electric motor industry in the country is still beset with barriers that hampers the development of the EE electric motors business in the country. Nonetheless, with the continued support from the GOC in promoting the increased level of production and application of HEMs, as well as in propping up the EMR industry (even without PREMCI), the previously anticipated low percentage of local electric motor manufacturers in China producing HEMs and REMs by EOP (i.e., energy efficient electric motors) by 2020 may still be expected.

[6] The current EE electric motor sales (in kW) of these 3 companies are: (a) Anhui Wannan Electric Corp – 890 kW (high-voltage HEMs); (b) Hunan Electric Group Co., Ltd. - 2,686,600 kW (HEMs); (c) Shanghai Motor System Energy Saving Engineering Technology Research Center Co., Ltd. - 7,848.3 kW (REMs).

A. 5. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

Because more existing electric motors will be phased-out due to this project, the HEMs will face less barriers compare to the baseline scenario, consequently the HEM industry will growing faster; while for the REMs, due to lack of techniques and financial support, the EMR industry will not be commercialized. As a result, the existing electric motors are less likely to be replaced or retrofitted in the absence of this project. Without the proposed alternative project that GEF will support, the energy utilization performance of electric motors produced and utilized in China will be at a relatively low level compared to other electric motors that are compliant with internationally recognized performance standards. That fact translates to a relatively higher energy consumption of electric motors and the systems, processes and operations in the Chinese industry sector that use them. This means also that the operation of these locally made electric motors will further add to the current rapidly growing consumption of electricity in the country. Considering the current trend and practices of using electric motors, the potential for utilizing locally made energy efficient units (HEMs and REMs) will not be realized if the proposed project will not materialize. The potential energy saving and energy cost savings that can be derived from the use EE motors in the country (particularly in the industries) will not be realized without the removal of certain barriers that hinder the promotion, production and utilization of EE motors (HEMs and REMs) in the country.

While the country has already initiated policies and actions to promote EE motors production and utilization in the country, and there are other ongoing broad energy efficiency programs that have components on energy efficient electric motors and motor systems, these rather limited and general actions are not sufficient to remove the identified barriers, create and sustain enabling environments, and facilitate or at least influence the increased investments in EE motor production and their widespread application in industries[7]. Without GEF support for funding the incremental cost for removing the barriers that this proposed project will address, the expected potential additional global environmental benefits (in terms of avoided CO2 emissions linked from the electricity that will be saved) would not be realized. Without this proposed project, China would have limited success in promoting the widespread utilization of EE motors, especially for the REMs; in increasing use of the HEMs; and, in the phasing-out of existing energy inefficient electric motors. Such efforts will be at a relative low level, and in so doing, the potential contribution to the country's GHG emissions reduction targets as well as the country's aim to conserve energy and protect both the global and local environment will not be fully realized. With the GEF support for the incremental cost needed to create the much needed market pull and technology push to remove the barriers that will in turn facilitate the increased share of HEMs and REMs in the local electric motor market. In so doing, the project will help realize for China the expected global environmental benefits of reduced GHG emissions from the energy savings that will be derived from the widespread use EE motors.

Within the project intervention period, there will be demonstrations and replications of the application of EE techniques in the design and manufacturing of HEMs and REMs, as well as in the application of HEMs and REMs in various industrial processes and industrial motor systems. The resulting electricity savings from the use of these more energy efficient electric motors relative to the use of less energy efficient standard electric motors (SEMs) translate into CO_2 emission reductions (from fossil fuel fired-power generation that produce the electricity used in electric motors). The estimates are based on an annual growth of sales volume of EE motors of XX% derived from a trend analysis of historical annual sales volume data

[7] These include baseline activities on EE motors promotion that the GOC and some local governments are supporting that will be subsumed into the proposed project, such as: MIIT (China Motor Energy Efficiency Improving Program); Shandong Provincial Government (EMR pilot program); Hunan Provincial Government (EMR pilot program); Shanghai Municipal Government (EE motor promotion and R&D); and, Anhui Provincial Government (EMR pilot program). Please refer to Part I, Sec. C for other activities of project partners that are subsumed into the proposed GEF project.

during the period 2005 - 2012. The assumed electric motor efficiency improvements are 0.25% and 0.15% for low-voltage electric motor and high-voltage electric motor, respectively, in the BAU scenario. In the alternative scenario these are 0.45% and 0.25% for low-voltage electric motor and high-voltage electric motor, respectively. With the estimated emission factor of 0.8 tCO_2/MWh based on the 6 regional grids, the corresponding CO2 emission reductions were estimated.

The PREMCI Project will facilitate the realization of an annual electricity savings of 5,559 GWh by 2019 (or at the end of the project in Year 4), and 34,035 GWh by 2029 (or 10 years from end of project). The equivalent reduction of CO_2 emissions is estimated at 4,447 kilotons (ktons) CO_2 per year in 2019; and, about 27,228 ktons CO_2 per year in 2029. Cumulatively, reduction of CO_2 emissions amounts to 7,986 ktons CO_2 by 2019 and 152,976 ktons CO_2 by 2029.

A.6. Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks: N.A.

A.7. Coordination with other relevant GEF financed initiatives

China has already initiated policies and is currently implementing actions to promote EE motors production and utilization in the country. There are also other ongoing broad energy efficiency programs that have components on energy efficient electric motors and motor systems. During the project design phase, the project development team has consulted with the implementers of these projects in the design of specific barrier removal activities that are proposed for PREMCI. These rather limited and general actions are not sufficient to remove the identified remaining barriers, create and sustain enabling environments, and facilitate or at least influence the increased investments in EE motor production and their widespread application in industries. Some ongoing projects related to electric motors in China are listed in the table below. Selected activities in some of these ongoing projects have been included in the PREMCI Project as baseline activities.

Ongoing Projects Related to Electric Motors in China

Name of Project	Planned Coordination Work
Energy-saving Products Project Benefiting the People-Energy Efficiency Electric Motor Promotion (ESPBP-EMP)	The ESPBP-MEP is an ongoing financial subsidy scheme for the application of EE electric motors. PREMCI will liaise/consult, and where possible, work together with the implementers of this project in implementing the barrier removal activities under Component 3: Financial Support & Accessibility Improvement, particularly in the design of financing schemes and incentives program for EE motor applications of electric motor users in Chinese industries.
Electric Motor Energy Efficiency Improvement Program (EMEEIP)	The EMEEIP intends to push forward HEMs development and application, promote upgrade of motor producing industry, and comprehensively improve motor efficiency to achieve energy-saving and emission reductions. PREMCI will coordinate with the implementers of this project in the implementation of the pertinent activities that will address the policy, finance, technology and information barriers to EE electric motor applications in Chinese industries.
China Energy Efficiency Promotion in Industry Project (CEEPI)	This is a MIIT/WB/GEF project that focuses on promoting energy management systems and capacity building in industry. The PREMCI project development has liaised/consulted with the implementers of the CEEPI Project (particularly those working on the policy research component) in designing the policy barrier removal activities under Component 1. PREMCI, where necessary, will also coordinate with CEEPI on the implementation of the Component 1 activities.
Motor Challenge Program (MCP)	This project focuses on promoting energy management schemes capacity building, such as energy standards development, energy management etc.

Name of Project	Planned Coordination Work
	PREMCI will interact and consult with the implementers of the MCP (particularly those working on the energy efficiency capacity development activities) in implementing the technical and information barrier removal activities under Component 4.
Barrier Removal to the Cost-effective Development and Implementation of Energy Efficiency Standards and Labeling (BRESL) Project	The PREMCI project development team consulted with the implementers of the BRESL (particularly the group working on electric motors standards and labeling) in designing the technical and information barrier removal activities under Component 4. Where necessary, PREMCI will coordinate with the same group in the implementation of the Component 4 activities.

Note: *STAP has also listed a number of electric motor energy efficiency projects in China as an annex to its Advisory dated October 7, 2013 that the PREMCI PMO can refer to for coordination work during the project's annual work planning.*

There are a large number of manufacturers, including many international companies, involved in manufacturing motors in China. Given the scale of the industry and the market, a training needs analysis (TNA) will be conducted by the project at the outset, to determine what training programs will be focused on by the project and will be conducted in strategic locations considering the resources available.

B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

B.1 Describe how the stakeholders will be engaged in project implementation.

The success of PREMCI Project implementation will depend on the development of effective partnerships between numerous different agencies, private industry groups and consumer sector at multiple levels. Partnerships will be pursued international and national agencies, as well as international partnerships to enrich and further project aims. The PREMCI project will form a partnership strategy with 3 elements: a) international coordinating and implementation function; b) national coordination and implementation function; and c) technical and commercial function.

The PREMCI project will undertake various activities to ensure that the project work is synergized with other on-going activities related to energy efficient appliances/equipment (particularly electric motor), as well as to benefit from the expertise available in the country. Partnerships will also be pursued very actively with the electric motor industry players, particularly HEM and REM companies which will host pilot manufacturing demonstration. These companies will stand to benefit from the technology conversion to more energy efficient electric motor technologies. The project will strengthen its links by developing inter-agency partnerships with key energy-related projects nationally and internationally. These will include the ESPBP-MEP co-implemented by MOF and NDRC, the EMEEIP launched by MIIT and AQSIQ, the CEEPI funded by GEF and implemented by the World Bank and MIIT, the MCP financed by EU Switch Asian, as well as the UNDP-GEF funded BRESL project. The PREMCI project will work also with financing institutions in the China to provide support for energy service related initiatives. In addition, the project will also partner with the various industry associations and NGO funding and implementation agencies to broaden the reach and impact of the PREMCI project.

B.2 Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):

The PREMCI project facilitates the realization of the GHG emission reduction potentials associated with the changeover to EE electric motors in China, and the potential GHG emission reductions from the interventions in the manufacturing of EE electric motors. The interventions come in four groups of actions

that deal with policy and regulations, capacity building, improving access to financing and market transformation towards EE motor production and application in Chinese industries.

The incremental activities of PREMCI project are focusing on additional enhancements in policy and regulations towards providing specific rules, guidelines and standards for HEMs and REMs; developing the capacity of the electric motor manufacturers to produce HEMs and REMs; enhancing capacity of testing, certification and regulatory institutions to tackle the needs of the growing HEM industry; determining the financial and business models and incentive mechanisms for both the HEM manufacturers and users and creating a conducive environment for the increased production and application of HEMs. In the description and budgeting of all the activities, the delineation of GEF and co-financing for each activity has been presented in detail in order to illustrate complementation of efforts with the activities of other ongoing similar projects as well as among the components proposed in the PREMCI project. The budgeting details have delineated that the GEF support will be mainly for the production and application of EE electric motors.

The anticipated global environmental benefits accruing at the end of the 4-year project through the implementation of this project include the following:

- Expected cumulative amount of GHG emission reduction of 7,986 ktons CO2 avoided during the project duration from the utilization of locally manufactured EE motors. This is based on the cumulative energy savings of 9,982 GWh/yr that are realized from the use of EE motors
- Lifetime direct CO_2 emission reduction of 44,470 ktons CO_2

B.3. Explain how cost-effectiveness is reflected in the project design:

The electric motors market trend will be most probable in line with steady economic development in the country and its growth for past few years and is expected to continue for the next 10-20 years. Cost-effective efficiency improvements require investments over the short-term, but these investments will return over more than twice as much over the same period. Since the project includes only electric motor types for which technical feasibility and cost-effectiveness can be clearly demonstrated, the benefits determined represent only a subset of the economy-wide potential. In addition, the electric motor technologies to be analyzed for HEMs and REMs represent a small segment of what is currently on the Chinese market. Technological innovations are certain to happen over the coming decades, and the project will trigger further developments and new opportunities for efficiency improvement. As the electric motor market is transformed to cater to more efficient varieties, the increased market share will definitely exert downward effects on unit costs of EE motors. This will also bring down the monthly power bills of the industries that will induce a lowering of prices of all the varied consumer items that will be produced.

The anticipated global environmental benefit through the implementation of this project is the avoided GHG emissions from the utilization of locally manufactured HEMs and REMs. This will result to cumulative electricity savings of 9,982 GWh by 2019 at the end of the project; and a projected value of 191,220 GWh in 2029 and 540,363 GWh in 2035. These electricity savings will translate into millions of dollars of avoided investments in new power plants and cumulative CO_2 emissions reductions equivalent to 7,986 ktons CO_2 in 2019 and over the long term to 152,976 ktons CO_2 in 2029 and 432,290 ktons CO_2 in 2035, or after 10 and 15 years after project the ends, respectively. Considering the GEF contribution of US$ 3,500,000 for PREMCI and the anticipated direct CO_2 emission reduction of 44,470,000 tons CO_2 and 10 years economic life of equipment (including project duration of 4 years), the unit abatement cost is about US$ 0.08/ton CO_2.

C. DESCRIBE THE BUDGETED M &E PLAN:

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 co-financing letters. These M&E findings will be reported on in the project's two in-depth independent reviews.

As the implementing agency for this proposed project, UNDP will allocate at total of US$ 80,000 for M&E supporting full size project implementation.

Type of M&E Activity	Responsible Parties	Budget US$*	Time frame
Inception Workshop (IW)	• Project Manager /Executing Agency • UNDP China & UNDP/GEF RCU	• Included in Project Management	Within first 2 months of project start up
Inception Report (IR)	• Project Team (MIIT) • UNDP China & UNDP/GEF RCU	• Included in Project Management	a) Draft IR available before IW b) Final IR available immediately following IW
Measurement of Means of Verification	• Project Manager /Executing Agency • Project team members	• Included in Project Management	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	• Oversight by UNDP-GEF RCU Technical Advisor and PM • Measurements by regional field officers and local IAs	• Included in Project Management	Annually prior to APR/PIR and to the definition of annual work plans
APR and PIR	• Project Team (MIIT) • UNDP China & UNDP-GEF RCU	• Included in Project Management	Annually
TPR and TPR report	• GOI Counterparts • UNDP China & UNDP-GEF RCU • Project Team (MIIT)	• Included in Project Management	Every year, upon receipt of APR
PAC/Tripartite Review Meetings	• Project Manager /Executing Agency • UNDP China	• Included in Project Management	Following Project IW and subsequently at least once a year
Periodic status reports	• Project Team (MIIT)	• Included in Project Management	To be determined by Project team and UNDP China
Technical reports	• Project Team (MIIT) • Hired consultants as needed	• Included in Component budget	To be determined by Project Team and UNDP China
Mid-term External Evaluation	• Project Team (MIIT) • UNDP- China & UNDP-GEF RCU • External Consultants (i.e. evaluation team)	• $ 30,000	At the mid-point of project implementation.

Type of M&E Activity	Responsible Parties	Budget US$*	Time frame
Final External Evaluation	• Project Team (MIIT) • UNDP China & UNDP-GEF RCU • External Consultants	• $ 30,000	At the end of project implementation
Terminal Report	• Project Team (MIIT) • UNDP China • External Consultant	• Included in Project Management	Two months before project end date
Lessons learned	• Project Team (MIIT) • UNDP China & UNDP-GEF RCU	• Included in Project Management	Two months before project end date
Audit	• UNDP China • Project Team (MIIT)	• $ 5,000	Annually
Visits to field sites	• UNDP China • UNDP-GEF RCU (as appropriate) • UNDP China/PAC representatives	• For GEF supported projects, paid from IA fees and operational budget	Annually
TOTAL INDICATIVE COST*		US$ 80,000	

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

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):

NAME	POSITION	MINISTRY	DATE
Jiandi Ye	GEF Operational Focal Point	International Dept., Ministry of Finance	12/17/2012

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

Agency Coordinator, Agency Name	Signature	Date	Project Contact Person	Telephone	Email Address
Adriana Dinu Executive Coordinator, UNDP/GEF		2 September 2015	Manuel L. Soriano Sr. Tech. Advisor Energy & Climate Change	+66-2-3049100 Ext 2720	manuel.soriano@undp.org

ANNEX A: PROJECT RESULTS FRAMEWORK

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: *Low carbon and other environmentally sustainable strategies and technologies are adapted widely to meet China's commitments and compliance with Multilateral Environmental Agreements*
Country Programme Outcome Indicators: *Cumulative CO_2 emissions reductions from 2011-2015; Baseline: 2011 Zero; Target: 2015 under UNDP supported project at 70 million tons CO_2 reduction*
Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): *Mainstreaming environment and energy*
Applicable GEF Strategic Objective and Program: *Promote market transformation for energy efficiency in industry and the building sector*
Applicable GEF Expected Outcomes: *Reduction of GHG emissions from the generation of electricity consumed by electric motors from thermal power generation plants*
Applicable GEF Outcome Indicators: *Cumulative CO2 emissions reduction by end-of-project (EOP), ktons*

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
GOAL: Reduction of greenhouse gas (GHG) emissions through the widespread application of energy efficient electric motors in China	• Cumulative CO_2 emissions reduction in the application of EE motors by end-of-project (EOP), *ktons*	• 0	• 7,986	• Documentation of annual data on electric motor energy consumption in Chinese industries from MIIT[8].	• GoC commitment to EE remains firm and private sector fully supports the program • .Continuous support of relevant GoC agencies and private sector even after PREMCI
	• Reduction in the annual growth rate of GHG emissions by EOP compared to that in Year 1, *%*	• 0	• 14.7		
OBJECTIVE: **Increased manufacturing and widespread application of energy efficient electric motors[9] in China**	• Electricity savings due to project intervention by EOP, *GWh/yr* • Percent of the local electric motor manufacturers in China producing HEMs and REMs by EOP, *%* • Average annual HEM production output by EOP, kW	• 0. • 5% • Limited or negligible[10]	• 5,559 • at least 40% • 102.1 million	• PREMCI M&E system reports. • Electric motor market monitoring report on EE motor manufacturing	

[8] This will be monitored using the M&E system that will be developed under the project

[9]Energy efficient electric motors (EE Motors) include both high efficiency motors (HEMs) and remanufactured electric motors (REMs). Electric motor remanufacturing (EMR) involves the retrofitting of low-efficiency electric motors through redesign, parts replacement and application of advanced electric motor techniques to produce high-efficiency remanufactured electric motors (REMs). The difference between EMR and electric motor rewinding is that the former results in a product (i.e., REM) that has higher efficiency than the original electric motor, while the latter results in the restoration of the operational functions of the original electric motor but at the expense of, at best, a unit percentage reduction in efficiency. Electric motor rewinding is the traditional way of extending the life of electric motors and is done to burned-out electric motors.

[10] Currently, there is no official statistics in China on the production and sales of HEMs/REMs. The available information are those on the production data from 6 pilot electric motor manufacturing companies that were supported by MIIT to produce energy efficient electric motors, as well as from manufacturers in Shanghai, where the percentage of industrial enterprises using HEMs and REMs is 6.5% and 1.4%, respectively. The project development team considered half of the said percentages for Shanghai as representative for China in Year 1. There are around 350,000 industrial enterprises in China, and that number has been almost

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
	• Average annual REM production output by EOP, kW • Cumulative capacity of low-efficiency electric motors phased-out, kW • No. of people gainfully employed in newly established EE electric motor production facilities by EOP	• Limited or negligible • Limited or negligible • 0	• 4 million • 106.1 million • At least 10 per company	• Survey reports and reports from the industries	
COMPONENT 1: POLICY AND REGULATORY FRAMEWORKS ON THE PRODUCTION AND APPLICATION OF ENERGY EFFICIENT ELECTRIC MOTORS (EE MOTORS)					
Outcome 1: Enhanced and clearly defined policy enforcement mechanisms on the production EE motors and their applications in the Chinese industrial sector	• No. of local electric motor manufacturers that produce EE motors by EOP • No. of electric motor suppliers/retailers that sell EE motors by EOP.	• Limited or negligible • Limited or negligible	• 800 • 1,000	• Report on the evaluation of policies and recommendations • Documentation of approved comprehensive program on EE motors and their application in Chinese industrial industries • Documentation and reports on the EE electric motor production and sales by the industry	• The length of time that policy adoption and approval will happen within the project duration
COMPONENT 2: ENERGY EFFICIENT ELECTRIC MOTOR PRODUCTION AND APPLICATIONS					
Outcome 2: Increased local production of EE motors for applications in Chinese industries	• % annual growth rate (YOY) of HEM production in the demonstration pilot companies starting Year 3 • % annual growth rate (YOY) of REM production in demonstration pilot companies starting Year 3	• Nil • Nil	• At least 10%[11] • At least 10%[12]	• Original production and operation records of HEM and REM manufacture and electric motor recycling support system • Special product survey monitoring reports	• Most EE motor manufacturers are interested to participate in the project demonstration and after the demonstration they will produce EE motors
COMPONENT 3: FINANCIAL SUPPORT & ACCESSIBILITY IMPROVEMENT					
Outcome 3: Increased application of domestically produced EE Motors(HEMs and	• No. of EM manufacturers that produce EE motors (HEM/REM) by EOP • No. of Chinese industries that use locally made EE motors by EOP	• 115[13] • Limited or negligible	• 920	• Monitoring reports on HEM/REM production	• Motor users are happy with their EE motors or that they utilize their EE motors rationally and properly

constant since 2011. For the rest of project years, the increasing rate of the enterprises using HEM and REM was assumed to follow the increasing rate of the annual production of HEM and REMs within the project period. This applies to all baseline values = "Limited or negligible"

[11] This is equivalent to an overall increase of 30% at EOP compared to the baseline year

[12] This is equivalent to a final increase of more than 60% compared to the baseline year

[13] According to the survey of MIIT, currently there are about 2300 EM manufacturer in China, in which only 5% producing HEM. The target of the proposed project is to increase the ratio of HEM and REM manufacturer to at least 40%.

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
REMs)in Chinese industries	• Using HEMs • Using REMs		• 90,000 • 10,000		
COMPONENT 4: ENERGY EFFICIENT ELECTRIC MOTOR PROMOTION					
Outcome 4: Increased market share of energy efficient electric motors	• % of market share of EE motors by EOP • Average annual volume of EE motor sales by EOP, MW	• Nil • 1,100	• 33% • 106,100	• PREMCI Project M&E reports • PREMCI Project annual reports • Electric motor market research reports conducted under the PREMCI Project	• Continued support by relevant agencies of the Government of China and all the stakeholders and companies • Cooperation of the EM manufacturers in market research surveys is ensured.

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

RESPONSES TO GEF U.S. COUNCIL MEMBER COMMENTS OF 28 OCTOBER 2013

Comment	Response
The STAP noted that the proposal generally aims to address this industry at a national level and seems "highly unfocused." Please elaborate specifically which training programs will be conducted or what demonstration activities will be implemented and in which regions. Also, please elaborate the incremental cost reasoning of the project; why is GEF funding necessary and additional?	The training programs target two principal stakeholders: (i) local electric motor manufacturers, focusing on the design and manufacturing of EE motors (HEMs and REMs) in 4 provinces (Shandong, Hunan, Shanghai and Anhui), where most of China's electric motor manufacturers are located; and (ii) selected electric motor users in Chinese industries in at least 10 provinces covering the application and design of systems using EE motors. These training programs will be designed based on the findings and recommendations from the EE motors capacity needs assessments that will be conducted during the project preparation and design (i.e., PPG stage) in the selected industries and these are likely to include : (1) Evaluation of EE motor designs from abroad for developing new design features in locally made EE motors; (2) Improvements in the EE motor design and in the local electric motor production process; (3) Modeling and performance evaluation of EE motors and electric motor system; (4) Integration of EE motors in electric motor systems; (5) Optimization of electric motor system operations; and, (6) Preventive/Predictive maintenance of EE motors and electric motor systems. As stated in the PIF, there will be at least 5 targeted demonstrations that will be implemented under the proposed project, and these will be on improved EE motor product design and manufacturing. These targeted demonstrations are meant to showcase EE motor manufacturing technologies that can improve product quality and consistency while minimizing scrap generation, direct labor and changeover times. These will showcase the effective deployment of modern manufacturing equipment and techniques, including the application of improved EE motor product design[14]. This will consist of technical assistance to selected electric motor manufacturers and pilot REM producers on the design and manufacturing of REMs and the prototype production of selected EE motor designs, including EE motor product testing. As mentioned in the PIF, because of the identified barriers to the improved quality of locally produced energy efficient electric motors (HEMs and REMs), and the widespread practice of the application of these EE electric motors in Chinese industries, the potential energy saving

[14] These can include the demonstration of the design and application of techniques for: (1) improved stator core assembly that can reduce copper losses in the stator windings (e.g., through increased conductor size, improved stator winding/injection, forming and lacing techniques, and using high performance materials for insulation and lamination), (2) reduced iron losses in the rotor coil or casting (e.g., by using materials with higher electrical conductivities), (3) reduced magnetic losses by using better quality magnetic steel; (4) improved motor aerodynamics to reduce mechanical windage losses; (5) improved bearings to reduce friction losses; (6) minimizing manufacturing tolerances; (7) improved motor cooling to lower heat generation, resulting in lower maintenance and a longer life; and, (8) improved tolerance to voltage variations and harmonics.

	and energy cost savings that can be derived from the use of these EE motors will not be realized. The project is intended to facilitate the realization of such potentials through the removal of such barriers. Hence, the main incremental activities are the proposed barrier removal activities plus those that were proposed to enhance the limited and fragmented baseline projects/activities that the local electric motor manufacturing industry has been doing and planned to do in the next 5 to 10 years on its own in the development of the local EE electric motor market. The incremental barrier removal activities will be a combination of "technology push" and "market pull" activities that will improve the energy efficiency levels of locally made HEMs and REMs by facilitating/enabling the effective promotion and application of advanced EE motor production and application technologies and techniques. One clearly incremental issue that will be addressed is the enhancement of the nascent electric motor remanufacturing (EMR) industry in China. As mentioned in the baseline scenario, the Chinese government has limited interventions for improving energy efficiency for locally made electric motors. Highly efficient motors are 40 Yuan/kW (or $6/kW) more expensive than standard electric motors. In China, no effective policy and regulations, nor long term incentives are available to push or incentivize local motor manufacturers to produce highly efficient motors (HEMs) or highly efficient remanufactured electric motors (REMs), and as a result their combined market share is limited. Without GEF involvement, the Chinese motor industry and market will continue following the same trend. This is the baseline of the Chinese motor industry and market. Incremental reasoning for the current project: The first and most important component of this project is to develop and enhance policy mechanisms for the production of HEMs. Without the GEF's contribution, these policies and regulations might be delayed for many years. Other contributions of the GEF to the project include capacity building for measuring and testing efficiency of motors.
Are the subsidies for remanufactured (recycled) electric motors (REMs) mentioned on page 7 limited to Chinese manufactured REMs?	It is possible that the subsidies are not limited to Chinese manufactured products and that imported products are also eligible. The government of China will have to make the policy decision on that. In the current "Project to Promote Energy-Efficient Products for the Benefit of the People" policy, foreign enterprises also received subsidies on their importation of EE products. In the long run, when energy efficiency policies and regulations on electric motors are effective in China, these subsidies will have to be removed.
Since the payback for more efficient motors is 2.8 to 0.9 years, why would customers buy less efficient motors? Is the price difference that large? Would education on the potential savings be a better way than subsidies to encourage	Standard electric motors (SEMs) are relatively cheap compared to the EE motors (HEMs and REMs). Electric motor users and original equipment manufacturers (OEMs) still prefer the least costly SEMs, which can be rewound if they get burned out. They are more concerned about the first cost of electric motors not the electric motor efficiency. Generally, the unit price of a locally made HEM is about 46% more than the unit price of a SEM. The limited government policies and regulations concerning the utilization of EE motors, and absence of restrictions for electric motor users in the existing standards and regulations, enables the continued use of low-efficiency SEMs. Phasing out SEMs would definitely help and this will be facilitated by the proposed project.

uptake of HEMs and REMs?	Stakeholders of the factories and companies do not know the cost-effectiveness of investment in high energy efficient motors. In addition to the provision of sustainable financial incentives (not necessarily subsidies), education and enhancing consumer awareness would definitely help. That's the reason why training programs and targeted demonstrations are included as among the major activities of the proposed project to enhance the capacity and awareness of both the local electric motor manufacturers, distributors and suppliers to invest in the local manufacturing and retailing of EE motors, as well as to enhance the awareness of the electric motor users (particularly the large users in the industrial sector) about the energy, economic and environmental benefits of using such electric motors.
Are there any barriers to importing HEMs? Are HEMS made overseas more expensive than Chinese ones?	There are no barriers to the importation of HEMs into China. But there is currently low demand for imported HEMs, let alone the use of HEM in China. The unit price of HEMs is significantly higher (1.4 to 1.5 times) than that of SEMs. EE motors (mainly HEMs) account for only 3% of the total electric motor production output in China. The locally manufactured HEMs also have lower energy efficiency performance compared to the imported HEMs.
Has any study been done on whether the rebate program in Component 3 would be the most effective alternative?	There was no study done yet to specifically determine the feasibility and effectiveness of a rebate program for electric motor users. The main basis for proposing such promotional program is the successful implementation of similar programs for EE appliance/equipment projects in China on CFC-free refrigerators, on EE room air conditioners, and to some extent on EE lighting products; all of which are UNDP-GEF projects. Initial discussions with the project proponents and stakeholders indicate that electric motor users will support this program. During the project preparation/design stage, a more detailed assessment will be carried out to enable the design of the program and its implementation that will take into account the suggestions of the potential program participants, as well as the experiences from the previously implemented EE equipment/appliance rebate programs.
In Component 4, why would a tracking system be needed to inform consumers of the benefits of buying more efficient motors?	A market tracking system will not directly be used to inform consumers of the benefits of using more energy efficient electric motors but the results (i.e., outputs) of that system will be used for the information dissemination and consumer campaigns. The tracking system will monitor the prices, sales volume, and availability of the different types and brands of electric motors sold in the market and their corresponding market shares. The information that will be derived from such system, as well as the technical and energy performance specifications of the various tested electric motor products in the market will also be disseminated as part of an EE motors procurement guide for the purpose of enabling consumers to choose the appropriate EE motor products.

STAP SCREENING OF THE PIF (OCTOBER 07, 2013)

STAP expresses its consent to the project based on the PIF screening noting: Minor revision required. The project aims at increased manufacturing and widespread application of energy efficiency electric motors in China. According to International Energy Agency (IEA-2011) electric motor systems account for about 40% of the world's total electricity demand and about 20-30% of this could be saved. The IEA concludes

that widespread, harmonized, minimum efficiency performance standards for motor driven electricity systems, combined with regulatory measures for gears and transmissions can lead to significant electricity conservation. Thus, China through this project seems to be addressing a very critical component of energy use through improved energy efficiency of motors. STAP has the following recommendations to be addressed at the CEO endorsement stage.

Comment & Response	Reference
Comment : 1. *It looks like there are a large number of past and ongoing programs and projects aimed at improving energy efficiency in motors in China. A Google search gets hundreds of websites on the topic. For example, one 2008 report from Berkeley shows a large number of efforts as listed below in the annex. The report is titled: Zhou, N. (2008): Status of China's Energy Efficiency Standards and Labels for Appliances and International Collaboration: Lawrence Berkeley National Laboratory (LBNL).* 2. *This is only a fraction of the ongoing efforts of which there are probably many more. Thus, there is a need for a careful review of all the past and ongoing programs as a first step for this project to learn lessons and avoid making mistakes in policies and regulations.* 3. *In this regard, the key is learning from the many other global experiences of improving motor efficiencies and setting regulations and performing standards. Component 1 currently states: (b) a detailed review of existing policies and regulations applicable to electric motor applications in buildings and industries in China. STAP recommends to expand this further by including a full review of global policies.*	
Response: The project development team agrees with the STAP observation and comments. The observed availability of past programs and reports about EE electric motors in China has been recognized by the MIIT and considering the developments in the electric motor (EM) industry in developed countries, it was ascertained that the quality of EMs in the country have to be improved further to become at par with those produced in the developed countries. From previous programs promoting high efficiency motors (HEMs), the most that the local EM industry has done is the production of HEMs that have high energy efficiency relative to standard electric motors (SEMs) that are locally manufactured. Such HEMs are actually not at par with those from developed countries. There may be some real HEMs produced by local EM manufacturers but these are HEMs that are specially manufactured (following client specifications) for foreign-based EM manufacturers (i.e., foreign EM brands), and are therefore are consigned to the foreign market. It is therefore, for most part, the review of these many various sources of information that were used as bases for the interventions that have been proposed for this project. Considering the stated project objective, the scope is both on improving the production and utilization of quality HEMs/REMs in China. The relatively poor quality of locally made EMs (SEM/HEM/REM) is the main reason for doing this project since electric motors are the primary piece of equipment that runs the machineries used in the Chinese industries. Apart from being relatively cheap, EMs can be rewound easily when they burnout, as many times possible although the efficiency deteriorates. Or they can just be replaced since the replacement EM is cheap (but low efficiency). And	Alternative Scenario, Component 1, Activity 1.1.2

Comment & Response	Reference
in China, the quality of the relatively more expensive locally produced HEMs/REMs is generally suspect. Industries generally do not use them because of the high first cost and the quality issue. If the quality of locally HEMs/REMs is improved through improvements in the manufacturing process, then such products can be available for both domestic and export markets. The project development team agrees with the STAP reviewer that it is important to learn from the many other global experiences of improving EM efficiencies and setting regulations and performing standards. Hence, as part of the project activities, a comprehensive study of EM efficiency improvement programs that have been done and are currently ongoing in other countries with similar circumstances in the industrial sector as in China will be carried out. This will cover the creation of favourable policy, regulatory and institutional frameworks to support the local manufacturing of HEMs/REMs as well as their widespread application in Chinese industries.	
Comment: 4. *A large number of sectors and industries deploy electric motors. Thus, there is a need for identifying the sectors or industries where there are the greatest opportunities for improving energy efficiency in motors.* **Response**: Agree. A comprehensive investigation and detailed analysis to characterize the local EM motor market in the industrial sector in China will be carried out under the proposed project. Industry sub-sectors that utilize electric motor driven equipment/machineries will be identified and be targeted for the HEM/REM demo applications under the project.	Component 1, Activity 1.1.2
Comment: 5. *There are a large number of manufacturers, including many International companies, involved in manufacturing motors in China. Given the scale of the industry and the market, it is not clear what training programs will be conducted or what demonstration activities will be implemented and in which regions. How large manufacturing industries can be helped by such a small project is not clear.* **Response**: A capacity needs assessment has been done during the project design stage. This will be followed up by a training needs analysis (TNA) will be conducted by the project at the outset, to determine what training programs will be focused on by the project and will be conducted in strategic locations considering the resources available. Based on the initial capacity needs assessment, the following would be among the aspects that would be covered in the training programs: (1) Evaluation of EE motor designs from abroad to verify feasibility of adopting new design features in locally made electric motors; (2) Investigation and evaluation of the feasibility of applicable improvements in the EE motor design and in the local electric motor production process; (3) Modelling and performance evaluation of EE motors and electric motor system; (4) Integration of EE motors in electric motor systems, and the optimization of such systems; and, (5) Preventive/Predictive maintenance of EE motors and electric motor systems. The project development team consider the "industries" referred to by the STAP reviewer as the electric motor manufacturers. Component 2: EE Motors Production and Applications will involve the technical capacity development for local electric	Component 2, Activity 2.1.2.1

Comment & Response	Reference
motor manufacturers and the pilot REM producers that are currently being supported by the MIIT program on electric motor remanufacturing (EMR). One of the major capacity development activities will be on the demonstration of the application of improved EE motor product design and manufacturing. This will involve the provision of technical assistance to selected electric motor manufacturers and pilot REM producers on the design and manufacturing of REMs, the prototype production of selected EE motor designs, including EE motor product testing. The selection criteria that will be developed and used will take into consideration various factors, among which would be the manufacturing capacity (i.e., number and total kilowatts capacity). In this regard, large electric motor manufacturers can potentially be selected as beneficiaries of the technical assistance. Large electric motor manufacturers that will not be selected can also benefit from the published results of the capacity development activities and demonstrations of the application of energy efficient EE motor designs and production. Finally, a sustainable follow-up plan will be developed towards the end of the project for the replication of the demos in other Chinese cities where other electric motor manufacturers can be assisted. In case the STAP reviewer was referring to manufacturing firms that use electric motors, these entities will benefit from the capacity development and promotional activities of the project on the proper applications of EE motors. Component 4 of the project includes activities that will assist electric motor users in Chinese industries in the proper application of EE motors, in particular Activity 4.5 (industrial consumer education campaigns on EE motor (HEM and REM) applications).	
Comment: 6. *Energy efficiency may be a low priority issue for end users. It is necessary to demonstrate the high benefits of investment in energy efficiency motors.* **Response**: Agree. This is something that will be demonstrated in the project, particularly to the industrial enterprises. Supporting policies and incentives will also be developed and lobbied for approval to encourage the industrial EM users in using HEMs/REMs, particularly those that are heavy electric motor users.	Component 3, Activity 3.1
Comment: 7. *STAP recommends a focused approach for energy efficiency motors rather than national efforts covering all industries at national level.* **Response**: The project focuses on the local manufacturing of EE electric motors (HEMs/REMs) so that the quality of these products will be improved so that these will be at par with those HEMs/REMs that are made in China but consigned to foreign buyers that have to comply with quality requirements. Considering the need to show the impacts of the HEMs/REMs it is necessary to also address the users. The characterization of the industry sub-sectors will help focus the application demos to those that have high usage of electric motors.	Component 2, Output 2.1
Comment 5: 1. *If not already found in the review to be undertaken, a 2008 international standard IEC 60034-30 for electric motor efficiency labelling revised in 2011 by the International Electrotechnical Commission (IEC) could be helpful for this project. (Global efficiency standards for 3-phase AC motors; Specifications from IEC*	

Comment & Response	Reference
60034-30. Be2.sew-eurodrive.com). It defines energy efficiency classes for single-speed, three-phase, and 50 Hz and 60 Hz induction motors and is designed to unify motor testing standards, efficiency requirements, and product labelling requirements so that motor purchasers worldwide have the ability to easily recognize premium efficiency products. **Response**: The project development team took note of this recommendation. Part of the project activities is the review of EE electric motor standards in other countries to be able to see whether these can be directly adopted or modified to suit the industrial motor requirements in Chinese industries.	Component 2, Activity 2.1.1.1. Footnote 8
Comment 5: 2. *Gaining traction in such a large market with so many manufacturers of high efficiency (HEMs) and re-manufactured motors (REMs) is difficult and requires stringent regulations in order to make an impact within a short period. Even so this will not change demand from some export markets where low cost can rule over higher efficiency.* **Response**: Standard electric motors (SEMs) made in China that have low efficiencies can be found in other countries. The reason why these are still manufactured in the country is because there is a market for this, and there are also buyers from abroad that order or place shipments for these items to be sold abroad. In both local and foreign markets, SEMs are relatively cheap compared to the EE motors (HEMs and REMs). Electric motor users and original equipment manufacturers (OEMs) in China and in the importing countries usually prefer the least costly SEMs, which can easily be rewound if these burned out, and used again. Such electric motor users are more concerned about the first cost of electric motors not the electric motor efficiency. But more stringent government policies and regulations concerning the manufacture, exportation/importation, and utilization of EE motors, and strict enforcement of standards and regulations for electric motor users are expected to gradually but surely reduce the use of low-efficiency SEMs. Phasing out SEMs would definitely help and this will be facilitated by the proposed project.	Component 1, Activity 1.6

China: Promoting Energy Efficient Electric Motors in Chinese Industries
Responses to GEFSec Comments 2 April 2013

Comments and Responses	Reference
5. Is the project consistent with the recipient country's national strategies and plans or reports and assessments under relevant conventions, including NPFE, NAPA, NCSA, NBSAP or NAP? **Comment**: *Not yet at this time. The PIF does not contain review information on China's national strategies and plans or reports and assessments under the Technology Needs Assessment (TNA) (seehttp://www.worldbank.org/projects/P120932/china-technology-needs-assessment-tna?lang=en) and in the Second and the Third National Communications. Please review the country's TNA and the National Communications, and clarify*	

consistency with national needs and priorities as articulated in these Convention-related documents. **<u>Response</u>**: The proposed project is in line with China's several plans[15] on the development of climate technologies. While the country China has yet to meet the technological standards of OECD countries, the Chinese government continuously stresses the role of advanced technologies for both climate change mitigation and adaptation to meet its sustainable development goals in a timely manner and at a minimum cost that does not threaten economic development and poverty alleviation. Both the transfer of best available global technologies to China and the enhancement of the local science, technology, innovation capacity and diffusion are necessary to make the most relevant and advanced technologies widely available for deployment. The ongoing WB-GEF project on technology needs assessment supports China's efforts to assess climate mitigation and adaptation technology needs and adopt corresponding global best practices. Said project will, among others, identify barriers to technology transfer, and also design one or more technology transfer mechanisms that would accelerate the ultimate deployment of prioritized technologies in both climate mitigation and adaptation. The project is also in line with the plans and recommendations set out in the country's national communications to the UNFCCC. The most recent national communications (i.e., 2nd National Communications), includes the application of energy efficient electric motors among the key energy conservation projects during the 12th Five Year Plan period (projects to promote energy efficiency products for the benefit of people)[16]. High efficiency electric motor products are also among those included to be demonstrated for industrializing energy saving technologies. As part of its continuing partnership with NDRC, the UNDP is currently assisting China in the development of its proposal for GEF funding of the preparation of its 3rd National Communications. It is expected that more intensive efforts towards the application of EE motors (HEMs and REMs) and the development of other types of EE motors, as well as other energy consuming appliances and equipment, will be among the climate change mitigation technologies that will be prioritized.	PIF: Last para, p. 15; First para, p. 16
6. Is (are) the baseline project(s), including problem(s) that the baseline project(s) seek/s to address, sufficiently described and based on sound data and assumptions?	
<u>Comment 1</u>. *Please change the monetary unit from CNY to US$* **<u>Response</u>**: All financial data in the PIF are now expressed in terms of USD (6.2 CNY/USD).	
<u>Comment 2</u>. *Please clarify the following statement copied from paragraph 2 on page 5 of the PIF:*	

[15] The most prominent are: (a) The Medium and Long-Term Development Plan for Renewable Energy; (b) The 12th Five Year Plan (2011-2015) with a focus on the development of seven strategic emerging industries (SEIs); and, (c) The Medium to Long Term Plan for the Development of Science and Technology.

[16] In 2010 the MOF and NDRC implemented the "Project to Promote Energy-Efficient Products for The Benefit Of The People" that included detailed rules to promote Energy Efficient Electric Motors, which basically incorporates relevant policies and standards, and a subsidy scheme for the use of EE motors." which is the subsidy standards and policy.

"The Government of China intends to remove the Y and Y2 series electric motors from the market. The local electric motor manufacturers and retailers are required not to produce and sell these outdated electric motor products." **Response**: In 2012, MIIT published the *"Phase-Out List (No.2) of the High Energy Consumption & Out-Dated Electric Motor Equipment"*; The Y and Y2[17] Series electric motors are included in this list. This is a mandatory policy. This makes the manufacturing of Y and Y2 products unlawful. The *"Phase-Out List (No.1) of the High Energy Consumption & Out-Dated Electric Motor Equipment"* was implemented in 2009 focusing on the phase-out of the J Series motor products. Now there are no more J Series products manufactured and sold in the local market. However, the Y and Y2 Series products currently account for above 90% of the electric motor market share in China. This makes it difficult to immediately achieve the planned phase-out, and clearly poses as a barrier to achieving the targets. In contrast, the J Series motors are very old products and therefore much easier to phase-out. It should be noted that this policy is only mandatory on the supply side (i.e., manufacturer, supplier, and distributor). The proposed project will not only address the removal of barriers to the phasing-out of the Y and Y2 Series motor products, but also enhance the ability of the local electric motor manufacturer to produce EE motors (HEMs), as well as re-manufacture existing motors to make them more energy efficient.	PIF: Para 1, p. 5
Does the government plan to ban the production and trade of Y and Y2 motors? If so, please indicate how the government will do it. **Response**: According to the MIIT Announcement (No.14 2012), the energy conservation supervision department in the local governments (e.g., provincial and/or city energy conservation supervision center) will be in-charge of regulating the electric motor manufacturers ensuring that the non-production and non-sales of the Y and Y2 Series motors are complied with. The sales of such motor products after October 2012 will be subject to fines. The ban does not apply to the sales of such motor products that are manufactured before October 2012.	PIF: Footnote 9
The information presented in the table on page 6 is calculated on the basis of an assumption: "a. Current local retail price. HEM price is typically 1.4 to 1.5 of SEM price; REM price is typically 1.2 to 1.35 of SEM price." If the government wants to ban the use of SEMs (Y and Y2 motors), how can we make such as an assumption? In other words, the calculation may have over-estimated the benefits of the HEM and REM motors. Please clarify. **Response**: The government ban is on the production and sales of Y and Y2 Series motors (SEMs), not on the use of existing installed SEMs that are being used as drives for various industrial equipment, appliances and systems. Hence, economic comparisons between HEMs/REMs and SEMs can be made for 2 cases: 1. Purchase and use of HEM/REM as replacement to an existing operational SEM; and,	PIF: Table in p.8; Footnote 14

[17] These are electric motors classified as Grade 3 motors, based on the GB18613-2006 standards.

2. Purchase and use of HEM/REM instead of a SEM that is manufactured before Oct 2012. The SEMs (i.e., those manufactured before Oct 2012) have a price advantage compared to HEMs and REMs. But these will incur higher operational costs compared to HEMs and REMs because of their relatively lower energy efficiency. It is obvious, that for the same capacity, the EE motors (HEM/REM) are more economical to operate than SEMs especially if the application is for long continuous operating hours. The estimated energy savings from the use of HEM and REM is actually still conservative since the possibility of having a much lower energy efficiency for existing SEMs (some of which are already near the end of their economic lifetimes) due to factors such as under-loading (oversized or not matched with load), intermittent operations, and having undergone several rewinding), were not taken into account. A much higher differential between the efficiency of HEM/REMs vs. SEMs would result in higher energy savings.	
Comment 3. *Please clarify the energy efficiency rates of an HEM and an REM. The table on page 6 shows that an HEM and an REM have the same efficiency (20720 kWh/yr). An HEM is more efficient than an REM.* **Response**: Generally, the remanufacturing of an electric motor costs more than repairing one (e.g., some parts in a 2.2 kW REM are from 3 kW SEMs, or sometimes the remanufactured motor will have to utilize high performance parts/components). An electric motor is re-manufactured to make its performance better (in terms of operating performance and energy utilization). A SEM can be re-manufactured to become a higher capacity and more energy efficient electric motor (i.e., a REM). In China, REMs are produced to make them at par with HEMs meeting the Grade 2 standard (GB18613-2006). The proposed project will involve capacity building for local electric motor manufacturers to produce REMs that meet Grade 2 standard, which calls for a motor efficiency the same as that for HEMs. Ensuring that REMs are compliant with the Grade 2 standard is part of the activities of the proposed project which is on the testing and certification system for REMs.	PIF: Footnote (d) in Table, p.6
7. Are the components, outcomes and outputs in the project framework (Table B) clear, sound and appropriately detailed? **Comment:** *Almost. Please add "TA" onto row No. 4 on page 2.* **Response**: "TA" added to Component 4 of the Project Framework	PIF: p.2
8. Are global environmental benefits adequately identified, and the applied methodology and assumptions for the description of the incremental/additional reasoning sound and appropriate? **Comment**: *Not yet at this time. Please see the comments in Box 6. In addition, please consider the following: 1. At the end of paragraph 2 on page 9 (Component 1..), add "(4) development of a government white paper or a government document to ban the production and trade of Y and Y2 electric motors in China"; and, 2. At the end of paragraph 3 (component 2...), add "(g) labeling motors with efficiency indicators."*	

Response: The ban on the production and trade of Y and Y2 Series electric motors is already covered in the *"Phase-Out List (No.2) of The High Energy Consumption & Out-Dated Electric Motor Equipment"* an implemented by MIIT, Also, China is already implementing the regulations for compliance to the set minimum energy performance standard (MEPS) for electric motors now (please see the foot note 8 in the PIF). During the project period, government of China will forbid the manufacturing of SEMs; however, there is no a mandatory standard or regulation for the existing electric motors, which means the user can keep their old electric motors. The aim of the proposed project is to (1) distribute Grade 1 & 2 (GB18613-2006) products, and (2) plan for the retrofit of the existing grade 3 products (including the dissemination of REMs).	PIF: Footnote 9
12. Is the project consistent and properly coordinated with other related initiatives in the country or in the region? **Comment**: *Not really at this time. Please consider coordinating the project with National Communications projects in China.* **Response**: NDRC has been working with the UNDP on China's national communications to the UNFCCC. In the response to Comment 5 above, since electric motors and electric motor systems are included among projects and technologies that the country is considering to mitigate climate change, it makes perfect sense to follow this up in the forthcoming 3rd National Communications. It also make sense to coordinate the work that will be done in the proposed project with the relevant aspects of the national communications project that would focus on climate change mitigation technologies, in general, and EE motors and motor systems, in particular.	PIF: First para, p. 16
13. Comment on the project's innovative aspects, sustainability, and potential for scaling up. **Comment**: *Not at this time. Please clarify further the innovation, sustainability, and scaling-up: For sustainability, please indicate what will happen after the project is over in the provinces which this project covers. These provinces include Shangong, Hunan, Shanghai, etc. As for scaling-up, please justify what will likely take place in China nationwide during and after the project implementation in terms of energy efficiency of electric motors.* **Response**: The provinces that are included in this project have large electric motor manufacturing establishments, as well as the country's electric motor research institutes. The current REM pilot companies are also in these provinces. During the project period, the results of the capacity building activities will be disseminated in other provinces with significant electric motor manufacturing capacity and substantial electric motor users. Also, the results of the HEM/REM design and manufacturing techniques and practices demonstrations will also be shared with the local electric motor manufacturers in those provinces, The scaling-up of the EE motor manufacturing initiatives will be carried out with local electric motor manufacturers that become interested and/or influenced by the	PIF: Component 4, First Para, p.11

successful results of the capacity building, technical assistance, and technology demonstrations that will be implemented under the project. Moreover, the scaling up and/or replication of the financing mechanisms (e.g., rebate schemes) will be implemented in collaboration with electric motor distributors/retailers (and where feasible and available, interested financing institutions) that will be influenced by the success achieved in the implementation of such financial support programs that will be carried out by the project. With a sense of optimism, it is expected that by end-of-project, HEMs will have a larger market share in the electric motor market in China, and the application rate of Grade 1&2 (GB 18613-2006) electric motors would reach 80%, and the energy efficiency of such type of EE motor will improve further by 2% to 3%. The project intends to facilitate the achievement of these targets of the MIIT by removing the barriers that are presently hindering their realization. For the emerging EMR industry, the phased-out SEMs will become the raw material of REMs. It will be difficult for the local EMR industry to grow in the absence of this project which will help facilitate the SEM phase-out.	PIF: 2nd Para, p. 11

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS[18]

A. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

PPG Grant Approved at PIF: US$ 150,000			
Project Preparation Activities Implemented	***GEF/LDCF/SCCF/NPIF Amount ($)***		
	Budgeted Amount	***Amount Spent To date***	***Amount Committed***
1. Revalidate Barriers and Baseline Projects/Activities	40,000	29,928	10,072
2. Identification, evaluation and selection of demonstrations	35,000	30,000	5,000
3. Conduct of Logical Framework Analysis (LFA) with the project stakeholders	26,000	20,000	6,000
4. Detailed Design of Project Components & Activities	20,000	17,536	2,464
5. Establishment of institutional framework for project partners/co-financiers in the project implementation and to ensure close coordination with co-financed baseline activities	29,000	27,768	1,232
Total	**150,000**	**125,232**	**24,768**

The project implementing partner, MIIT, assembled the project development team that carried out the PPG Exercise. The team came up with the available data and information that were utilized for the project design. The data gathering, processing and analyses have made possible the clear understanding of the current situation concerning the issues and concerns regarding the intentions and plans of the local electric motor industry to manufacture and promote the use of EE electric motors (HEMs/REMs) in Chinese industries. The discussions with the key stakeholders and project partners (mainly the local governments and electric motor manufacturers that are supporting the pilot programs on HEM/REM production) have made possible the identification of relevant issues and barriers that need to be addressed and considered in the development and implementation of the PREMCI project. Intensive discussions with the relevant industry associations have made it possible for the project team to fully understand the nature and extent of these issues/barriers. The logical framework analysis that was carried out by the team together with the stakeholders has enabled the confirmation of the previously defined project goal and objective, and expected outcomes. Discussions with the manufacturers, particularly regarding their technical capacity development needs, and their product confidentiality concerns became the basis of the demonstrations and specific technical assistance in various aspects of EE electric motor design, manufacturing and applications. The discussions with the stakeholders and project partners also resulted in getting commitments for the co-financing of the baseline activities that were subsumed into the project; as well as in the agreed project coordination mechanisms and the project implementation arrangements. The outputs of these PPG activities were used in the detailed design of the PREMCI components and activities.

Overall, the PPG Exercise has achieved the PPG objective of designing, developing and documenting the PREMCI project document.

[18] If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used**)**

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

No reflows of funds are foreseen under this Project.

United Nations Development Programme
Country: People's Republic of China

PROJECT DOCUMENT[1]

Project Title:	**Promoting Energy Efficient Electric Motors in Chinese Industries (PREMCI)**
UNDAF Outcome(s):	*Low carbon and other environmentally sustainable strategies and technologies are adapted widely to meet China's commitments and compliance with Multilateral Environmental Agreements*

UNDP Strategic Plan Environment and Sustainable Development Primary Outcome: Low carbon and other environmentally sustainable strategies and technologies are adapted widely to meet China's commitments and compliance with Multilateral Environmental Agreements
UNDP Strategic Plan Secondary Outcome:
Expected CP Outcome(s): Reduction of GHG emissions from the generation of electricity consumed by electric motors from thermal power generation plants
(Those linked to the project and extracted from the country programme document)
Expected CPAP Output (s): Mainstreaming environment and energy
Those that will result from the project and extracted from the CPAP)
Executing Entity/Implementing Partner: Ministry of Industry and Information Technology (MIIT)
Implementing Entity/Responsible Partners: MIIT and United Nations Development Programme

Brief Description

PREMCI's objective is to enhance the manufacturing and widespread application of energy efficient electric motors in China. To achieve this, the identified barriers to the effective promotion and extensive application of high efficiency motors (HEMs) and remanufactured motors (REMs) in Chinese industries have to be removed. If the manufacturing process is performed properly employing advanced technologies and techniques and in qualified and competent EE motor production facilities, relatively low cost and high quality EE motors (HEMs and REMs) can become available in the local electric motor market. The utilization of EE motors is expected to bring about large gains in electricity savings in the operation of electric motor systems in industries. This translates to benefits to the global environment, as well as to China's economy and local environment given the significant economic cost and local pollution associated with power generation and consumption. PREMCI intends to facilitate the realization of such potential by removing the identified barriers that up until now has prevented China from realizing substantial GHG emission reductions that would contribute to the achievement of the countries climate change mitigation targets. The project will address current teething problems in the emerging EMR industry in China which focuses on the recycling/repowering of old or broken/burnout electric motors and improving their energy efficiency; as well as retrofitting the existing less energy efficient standard electric motors to turn them into high efficiency REMs. The proposed project will focus on removing a number of key barriers in the local electric motor industry. A combination of "technology push" and "market pull" activities will be employed to enhance the energy efficiency levels of HEMs and REMs that are locally produced in China by facilitating/enabling the effective promotion and application of advanced EE motor production and application technologies and techniques. It is expected that by the end-of-project, at least 40% of the local electric motor manufacturers in China will produce HEMs and REMs. Ten years after the end of the project, with an average 3% improvement in energy efficiency of locally made EE motors, the estimated cumulative energy saving would be no less than 55,590 GWh, which translates to a reduction in GHG emissions of at least 44.47 million tons CO_2.

[1]For UNDP supported GEF funded projects as this includes GEF-specific requirements

Programme Period:	2015-2019
Atlas Award ID:	00086680
Project ID:	00093919
PIMS #	5121
Start date:	June 2015
End Date	June 2019
Management Arrangements	NIM
PAC Meeting Date	

Total resources required	$ 21,200,000
Total allocated resources:	
• GEF	$ 3,500,000
• Others:	
o Government	$ 1,900,000
o Local government	$ 10,000,000
o UNDP	$ 300,000
In-kind contributions	$ 5,500,000

Agreed by (Government):

Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

Date/Month/Year

Agreed by (UNDP):

Date/Month/Year

Table of Contents

List of Abbreviations & Acronyms

APR/PIR	Annual Project Report/Project Implementation Review
AWP	Annual Work Plan
APRC	Asia-Pacific Resource Centre
BRESL	Barrier Removal to the Cost-effective Development and Implementation of Energy Efficiency Standards and Labeling Project
BAU	Business as usual
CO_2	Carbon dioxide
CNCA	China Certification Agency
CEEPI	China Energy Efficiency Promotion in Industry Project
CEEPI	China Energy Efficiency Promotion in Industry Project (
CIECCPA	China Industrial Energy Conservation and Clean Production Association
CNY	China Yuan
CCM	Climate Change Mitigation
COSS	Country Office Support Service
CPAP	Country Program Action Plan
EITT	Educational Innovation Through Technology
ES&L	Efficiency standards and labeling
EMEEIP	Electric Motor Energy Efficiency Improvement Program
EMR	Electric motor remanufacturing
EE	Energy efficiency
EPC	Energy performance contracting
ESCO	Energy Service Companies
ESPBP-EMP	Energy-saving Products Project Benefiting the People-Energy Efficiency Electric Motor Promotion
AQSIQ	General Administration of Quality Supervision, Inspection and Quarantine
GWh	Gigawatt hour or 1,000 megawatt-hours
GHG	Greenhouse gas
HEMs	High efficiency motors
ICA	International Copper Association
IEC	International Electrotechnical Commission
ktons	Kiloton or 1000 tons
kV	Kilovolt
kW	Kilowatt
LFA	Logical Framework Analysis
MEPS	Minimum energy performance standard
MEP	Ministry of Environmental Protection
MOF	Ministry of Finance
MIIT	Ministry of Industry and Information Technology
MOST	Ministry of Science and Technology
M&E	Monitoring and evaluation
MCP	Motor Challenge Program
NDRC	National Development and Reform Commission
NEMA	National Electrical Manufacturers Association
NPM	National Project Manager
NEX	Nationally-Executed
OEMs	Original equipment manufacturers
PRC	Peoples' Republic of China
PMU	Project Management Unit
PPM	Project Planning Matrix
PSC	Project Steering Committee
PREMCI	Promoting Energy Efficient Electric Motors in Chinese Industries
REMs	Remanufactured electric motors
TAC	Technical Advisory Committee
UAC	Unit abatement cost
UNDP	United Nations Development Programme

1. SITUATION ANALYSIS

1.1. Context and Global Significance

1. Globally, electric motor systems have been identified as the major electricity consumer in the industrial sector of countries, and have been recognized as having one of the largest energy and energy cost savings potentials. These electric motors are by and large responsible for about 70% of industrial electricity consumption. It is estimated that in 2011, electric motor systems accounted for an estimated 64% of China's total annual electricity consumption, or about 3 trillion kWh with the installed capacity of 1.7 billion kW. On average, locally produced electric motors in China typically have efficiencies that are lower by approximately 3 to 5 percentage points than those in the developed countries such as the USA and Canada. Due to high duty levels, even a small gain in motor efficiency can result I significant electricity savings. It has been estimated that there will be 26 billion kWh annual electricity saving amount for 1% efficiency improvement. In this regard, the country has ample reasons and opportunities to improve the efficiency of locally made and used electric motor[2].

Country/Region	Super Premium	Premium	High	Low
Europe	IE4 (draft)	IE3 2015 (2017)	IE2	IE3
U.S./Canada		NEMA Premium 2010	EPAct 1997	
China Standard (2006) GB18613-2006		Grade 1	Grade 2 (2011)	Grade 3*
China Standard (2012)** GB18613-2012	Grade 1	Grade 2	Grade 3	

*The Y and Y2 series electric motors are categorized to Grade 3 in the 2006 standard (GB18613-2006), occupy almost 90% of market share in China.
**GB18613-2012 was recently published in China, The policies and plans made before 2012 were based on GB18613-2006. The effective date of this new standard is unknown.
Source: CGGC, based on (Leroy Somer, 2009), except GB18613-2012.

2. The national standard GB18613-2012 was implemented in September 2012, and the outdated electric motor product inventory was phased out in October 2012. The Government of China intends to remove the Y and Y2 series electric motors from the market. The local electric motor manufacturers and retailers are required not to produce and sell these outdated electric motor products. However, existing owners of such kind of products can continue to use them. Because there is currently no mandatory requirement for electric motor users to use the GB18613-2012 premium/high rated electric motors, the continuous use of the standard low-efficient electric motors is a barrier in achieving the set targets for the electric motor industry as stipulated in the Industrial Energy-Saving 12th Five-Year Plan of the MIIT. In the foreseeable future, the old electric motors presumably will remain operational for a long time span[3].

[2] In China, the most popular electric motors manufactured and used are those of the Y and Y2 series. These are standard electric motors that are produced since the 1980s (Y series). The Y2 series electric motors have been in production since the 1990s. These standard electric motors account for almost 90% of the local electric motor market. The rest is accounted for what are considered locally as high efficiency motors (HEMs). These are locally manufactured HEMs, which include those of the YX, GX and HJN series. Furthermore, only 30% of the HEMs manufactured are for the domestic market. In recent years, China has begun implementing labeling and minimum energy performance standard (MEPS) schemes for electric motors. The electric motor efficiency classification in China is comparable to that of the International Electro-technical Commission (IEC) standards (see table below). The Y and Y2 series electric motors are categorized as Grade 3 in the 2006 standard (GB18613-2006) and below Grade 3 in the 2012 standard (GB18613-2012).

[3] This is due to the reasons listed below: (1) Typical lifetime of standard low-efficiency electric motors is generally

3. Currently there are over 2,300 electric motor manufacturers in China. Among these, only about 50 are capable of producing HEMs. In that regard, locally manufactured HEMs account for only about 10% of the total electric motor production output of the country. Most production of small and medium-sized three-phase asynchronous motor has not reached the new standard of level 3, about 83% of the total; Level 3 products accounted for 16.2%; Level 2 products is only 0.8%; No product is for grade 1. It was estimated that in 2011, there more than 1.7 billion KW (or 1,700gigawatt or GW) total capacity of cheap and inefficient electric motors that have been installed in China. These electric motors manufactured and used are those of the Y and Y2 series. These are former standard electric motors that are produced since the 1980s (Y series) and 1990s (Y2 series) account for almost 90% of the local electric motor market. As mentioned above, the new national standard GB 18613-2012 requires manufacturers and retailers not to produce and sell anymore the former standard motors which the Chinese government intends to phase out from the market.

   Although new the standard was effective in September 2012, most manufacturers are very slow to transform motors to standard HEMs. However, the demand is limited for HEMs that were produced in accordance with the order. It should be noted that about 70% of these HEMs are for export. Way back in March 2010, China implemented a financial subsidy scheme for electric motor users providing subsidies for the purchase of HEMs from 12 CNY/kW to 60 CNY/kW. However, such scheme turned out to be not effective because electric motor users and original equipment manufacturers (OEMs) still prefer the least costly standard electric motors, which can be rewound if they get burned out. Clearly the motor efficiency is not a major concern among the users.

   Although some of motor manufacturers have the ability to develop and produce EE motors, however, the market share is still so small at less than 10%. Most of motors are purchased by both original OEMs and end-users. In China, more than 60% of electric motor buyers are not end-users but the OEMs. When OEMs buy motors as their equipment drives, they mainly care about price besides power output and life since the price of energy efficient motors is usually higher than that of typical standard motors. So the price is the most important factor that restricts the wide application of high efficiency motors. The producer tends to only produce EE motors by orders and with limited volume the manufacturing business becomes less profitable.

   It is very important that the industry players are directly involved in the government's support activities for market enhancements for EE motors. Currently there are over 2,300 electric motor manufacturers in China. Among these, only about 50 are capable of producing HEMs. In that regard, locally manufactured HEMs account for only about 10% of the total electric motor production output of the country as mentioned above. It should be noted that about 70% of these HEMs are for export. The national new standard GB18613-2012 was implemented in September 2012. The Government of China intends to remove the Y and Y2 series electric motors from the market. The local electric motor manufacturers are required not to produce and sell these outdated electric motor products.

4. The current situation in the electric motor industry is characterized by the following:

over 20 years, and the users of these electric motors believe that the repair (i.e., rewinding) of burnout motors makes economic sense; (2) Industrial companies stock backup electric motors of the same type and size to prepare for breakdowns; and, (3) In case of an electric motor breakdown (burnout), users typically will have it rewound to avoid higher investments in a new one.

- Presently, the types of motors that are being produced and used in China are mainly Y and Y2 low-voltage three-phase asynchronous motors. They have totally accounted for nearly 90% of the market, but their average efficiency is 2 to 5 per cent below the international advanced ones. Although there are many companies capable of producing high efficiency motors, as represented by series of YX, YX3, GX and HJN, the market for high efficiency motors remains small, and a big portion of them are exported overseas. Domestic demand is still limited which is about 3% of total market share.
- Although the energy efficiency criteria for small and medium three-phase asynchronous motors, high-voltage high power motors and permanent magnet motors have been promulgated and implemented, the lack of relevant standards of REMs hampered the development of REMs.
- There are very limited government-led interventions for improving the energy efficiency for locally made electric motors. Although MIIT launched the program of removing high energy consuming and outdated electromechanical equipment /products out of the directory, however, there are also still so many low energy efficiency motors in use.
- R&D in the area of EE motors is currently limited to individual efforts. Before the 1990's, our country's motor is entrusted by the state on the unified design, its main products are series of Y and Y2 series. After that, the country cancelled the uniform design. Only major companies have independent research and development ability, and have developed its own efficient series, such as YX, GX, etc., while most of the research and development ability of enterprises lack efficient motor.
- Converting existing standard electric motor production line for EE motor production is currently not economically feasible for the over 2000 electric motor manufacturers in China. The target of MIIT's plan, by 2015, 50% production of small and medium three-phase asynchronous motors and 40% production of high-voltage high power motors are expected to be reached high efficiency level.
- The application of advanced technologies is constrained by lack of investment due to inadequate support and enforced policies. Although NDRC released "Key Energy Conservation Technology Promotion Catalog", but up to now, there isn't any mandatory approach to implement this catalog.
- Some motor manufacturers lower their prices by reducing product quality and energy efficiency which dampens the enthusiasm of high efficiency motor manufactures to engage in activities on research and development of high efficient motor products. Although the state has promulgated and implemented the energy efficiency standards for small and medium three-phase asynchronous motors and low power motors, absence of supportive policies and regulation mechanism adds a lot of difficulty to implementation of the criteria.

Currently, the ratio of specialized electric motor to universal electric motor in the country is about 3:7, and the ratio in advanced countries is about 7:3. This ratio is expected to be raised to 5:5 within the "12th Five-Year Plan" period. In terms of HEMs, the share in the domestic market is about 5%, and the country is giving great impetus to the usage of HEM through electric motor energy efficiency promotion plan, energy conservation people-benefit project and other measures. In the future, the market of specialized HEM locally is bright. To support this, however, there is insufficiency in specialized HEM design software and models to meet the current development requirements of specialized HEM. Therefore, specialized HEM design software and models should be developed under the project to meet the needs.

5. Recently, some Chinese industries become interested in the use of remanufactured (recycled) electric motors (REMs). However, the current situation for the electric motor remanufacturing (EMR) enterprises is not optimistic due to low production capacity and

absence of a mature product value chain, as well as other barriers that are very similar to those that currently hinder the increased local production of HEMs and their widespread application in Chinese industries.

Currently, the REM industry is starting in the country with wide market prospects in the future and some electric motor manufacturing enterprises are interested to set foot in the REM industry. There is a big difference between HRM and new electric motor manufacture regarding technical standards and requirements. Along this line, the technical capacity of the HRM staff needs to be upgraded to respond to market growth and provisions. Therefore, it is seriously necessary for the HRM technical staff to receive capacity building through essential training and information sharing.

6. The following table shows the comparison of the unit price, electricity consumption and annual operating & maintenance cost of the major types of locally manufactured electric motors that are used in Chinese industries. The data are for the commonly sold size of electric motor in China which is 2.2 kW.

Table 1: Comparison of Standard, High Efficiency and Remanufactured Electric Motors in China

Electric Motor Type	GB18613-2006 Classification	Price (CNY)[a]	Annual Electricity Consumption (kWh)[b]	Annual O&M Cost (CNY)[c]
SEM	Grade 3	500	21,241	15,626
HEM	Grade 2	730	20,316	14,945
REM	Grade 2	648	20,316	14,945

a. Current local retail price. HEM price is typically 1.4 – 1.5 of SEM price; REM price is typically 1.2 to 1.35 of SEM price.
b. Assume 8,000 annual operating hours
c. Based on industrial tariff price for electricity. Generally, the maintenance cost is very low for most electric motors, and usually only when the motor is damaged. In some places the repair cost is 50 CNY per kW

7. There is still much room for improving the current efficiency levels on the technology side to be effectively guided by energy efficiency standards development, certification and enforcement which are main interventions of PREMCI that offer big energy saving and CO2 reduction potentials. However, this will not happen if the above-mentioned price differentials between HEMs/REMs and SEMs continue to be significant. This will prevent the market for HEMs/REMs to buildup. Aside from the acquisition cost factor, the effect of the operating and maintenances cost on the preference for HEM/REM use is not significant. Based on life-cycle costing at 8,000 annual operating hours and the prevailing industrial tariff for electricity, generally, the maintenance cost is very low for most electric motors. Repair cost in case of damage is also low at 50 CNY per kW. Unless something is done to develop the market for HEM/REM to bring unit production cost down and realize efficiency improvements, they will continue to be uncompetitive with SEMs. The significant energy saving, cost saving and GHG reduction advantage due to more efficient operation will also continue to be overlooked.

8. Some of the existing policies in the country along with key targets are as mentioned below:

- *Financial Subsidy Scheme.* In March 2010, China implemented a financial subsidy scheme for electric motor users providing subsidies for the purchase of HEMs from 26 CNY/kW to 100 CNY/kW with the following scheme:

Category	Rated output power（kW）	Subsidy for HEM (Grade 1&2), *RMB/kW*
LV, three phase asynchronous motor	0.55≤ Pn ≤22	58

LV, three phase asynchronous motor	22< Pn ≤315	31
HV, three phase asynchronous motor	355≤ Pn ≥ 25000	26
Permanent Magnet Motors	0.55≤ Pn ≥ 315	100

- *12th Five Year Plan - Energy Conservation and Emission Reduction Comprehensive Work Plan***.** The plan, which became effective on 31 August 2011 requires the implementation of Top 10 Energy Conservation Projects that includes energy conservation on motor system. The target of the plan is to increase the operation efficiency rate by 2 to 3 % by year 2015. In addition, the plan also includes support for the development of Permanent Magnet Coreless Motor to implement a financial subsidy scheme for electric motor application.

- *12th Five Year Plan - Energy Conservation and Environmental Protection Industry Development Plan***.** The plan which was published on 6 June 2012, refers to the demonstration and application of high efficiency technology of Permanent Magnet Coreless Motor and Copper Rotor Motor, the promotion of technology and equipment of Grade 1 & 2 of small and medium three-phase asynchronous motors, fans, pumps, compressors and VSD system and increasing operation efficiency of motor system.

- *12th Five Year Plan - The National Strategic Emerging Industry Development Planning***.** The plan which was issued on 9 July 2012, requires that high efficiency motors (HEMs) be developed to support emerging industries.

- *Energy Efficiency Standard Scheme***.** The energy efficiency standard on motor system and equipment, as a basis for China's implementation of energy conservation policies, specifies the requirements for equipment energy efficiency when the product performance and safety requirements are maintained. The main contents and indicators of China's energy efficiency standard are formulated for various energy conservation policies as well. The energy efficiency standard defines the minimum allowable values of energy efficiency, the minimum allowable values of target energy efficiency, the evaluating value of energy conservation and the energy efficiency grade index. The minimum allowable values of energy efficiency, or also referred to as mandatory minimum energy performance standard (MEPS), serve as a technical basis for implementing the threshold of an elimination system of energy-intensive products. The MEPS will be implemented in four or five years. The evaluating value of energy conservation is a technical basis for implementing the energy conservation product certification. The energy efficiency grade is a basis for implementing the energy efficiency label system. GB 18613 is the mandatory energy efficiency standard for electric motors in China to promote the energy efficiency improvement of the motor and motor system with new EE standard as GB 18613-2012 effective on 1 Sep 2012.

- *Energy Label Program***.** As a very successful case of China's energy conservation policies, the comparative label adopted as the China Energy Label, plays a significant role in enhancing the energy efficiency of energy-consuming products and eliminating the energy-intensive products. In past 10 years, the range of endorsement label expanded from household appliances to more than 50 product categories including electric motors.

- *High energy consuming and outdated electromechanical equipment/products phase-out of the directory***.** This program was started by MIIT on 16 December 2009. As of now, it has published the 2nd group of equipment/products under the program. Some motor products of J series and Y series were required to be phased out of the market.

- *Motor Energy Efficiency Improving Program***.** MIIT launched the program in January 2013. The target of this project will be converting existing standard electric motor production line for EE motor production. By 2015, 50% of the production of small and medium three-phase asynchronous motors and 40% of the production of high-voltage high power motors are expected to reach the desired higher efficiency levels.

9. The electric motor sub-sector that is covered by the PREMCI Project (also indicating those that will not be covered) is listed in **Table 2.**

Table 2: Electric Motor Industry Sub-Sector Products and Applications Covered and Not Covered in the PREMCI Project

Electric Motor Products	Applications
Included in PREMCI	
a. Low-voltage three-phase asynchronous motors with energy efficiency reaching IE3 standard	Motor drive for draught fans, pumps, compressors, machine tools and other equipment
b. High-voltage three-phase asynchronous motors with energy efficiency reaching Grade 2 of China standard	Motor drive for draught fans, pumps, compressors and other equipment
c. Permanent-magnet synchronous motor with energy efficiency reaching Grade 2 of China standard (self-starting, no iron core, servo control)	Motor drive for textile machinery, elevators, machine tools and other equipment
Not included in PREMCI	
a. Low-voltage three-phase asynchronous motors with energy efficiency below IE2 standard	Motor drive for draught fans, pumps, compressors, machine tools and other equipment
b. Frequency-control three-phase asynchronous motors	Motor drive for draught fans, pumps, compressors and other equipment
c. Wound-rotor three-phase asynchronous motors	Motor drive for elevators, milling machines, rolling mills and other equipment
d. Special-purpose three-phase asynchronous motors	Submersible motors, multi-speed motors, control motors and so on

10. The electric motor applications that will be covered in the proposed project and the volume of electric motors sold in 2013 (baseline year), the typical indices of energy efficiency ratio in 2012 prior to the PREMCI and the number of electric motor manufacturing companies are listed in **Table 3** below.

Table 3: Electric Motor Applications Covered by PREMCI, Number of Units Sold, Typical Energy Efficiency Indices in 2012 and Number of Companies

Electric Motor Types	Application	Installed capacity of units sold in 2012	Typical energy efficiency indices prior to PREMCI	Number of Manufacturing Companies
YE3 series low-voltage super-efficient three-phase asynchronous motors	Draught fans, pumps, compressors and machine tools	0	89%	15
YX series, YXKK series and YXKS series high-voltage high-efficient three-	Draught fans, pumps, compressors	8 million kW	94%	13

Electric Motor Types	Application	Installed capacity of units sold in 2012	Typical energy efficiency indices prior to PREMCI	Number of Manufacturing Companies
phase asynchronous motors				
Self-starting permanent-magnet synchronous motors	Textile machinery, oil pumping units in oil fields	40,000 kW	89.6%	5
No-iron-core permanent-magnet synchronous motors	Electricity generating set	10,000 kW	91%	1
Tractor-use permanent-magnet synchronous motors	Electric lift	400,000 kW	83.4%	2
Servo-control permanent-magnet synchronous motors	Injection molding machine, sewing machines, machine tools, printing machinery	350,000 kW	87.3%	5

1.2. Barrier Analysis

11. In consultation with the key stakeholders of the project during the Logical Framework Analysis (LFA) Workshop conducted on 27 November 2013 in Beijing, the main barriers to the promotion and extensive application of HEMs and REMs in Chinese industries were validated and confirmed as follows:

- Inadequate policies and regulatory frameworks–There are limited government policies and regulations concerning the utilization of EE motors and in the enforcement of applicable energy performance standards for electric motors sold locally and used in electric motor systems in industries. Presently, the existing standards and regulations have no restrictions on electric motor users, thus existing standard low-efficiency electric motors will continue to be used. There are also no regulations and mandatory standards applicable to the emerging EMR industry.

- Lack of capacity to locally produce EE motors –There are very few EE motor (HEM and REM) manufacturers in China. The existing ones often have limited technical capacity in designing and producing products that are at par with international standards (e.g., IEC, NEMA) in terms of quality and energy utilization performance.

- Shortage of financing for EE motors production and application –Since it is not mandatory for industries to utilize EE motors the share of EE motors in the local electric motor market is relatively low compared to that of the widely available less efficient standard electric motors. Conversion of existing electric motor production lines to produce EE motors will require high investments that may not be forthcoming if the demand for EE motors is low. Those that are currently engaged in the EMR business will require additional capital to pay for improving the quality and energy performance of their products; for availing of higher quality raw materials that will be used in REMs; and for promotion and market development of their REM products.

- Low level of awareness about, and lack of accessible information on technologies and techniques in the design and production of EE motors (HEMs and REMs)-Few Chinese HEM and REM manufacturers are aware of, or adequately know, the latest technologies and techniques for the design and production of EE motors, and improving the efficiency of old and potentially recyclable electric motors. This is further

aggravated by the difficulties in accessing the rather limited information about such technologies/techniques particularly on REMs. In the case of REMs, such EE motors are not easily identifiable and recognizable to most electric motor users as these are difficult to distinguish them from the standard electric motors. Consequently the users lack confidence and interest in buying such products. There is also a dearth of information about REMs, their quality and performance.

These barriers are addressed by the project activities as follows towards resolving them to achieve the overall goals and outcomes of the project:

Identified Key Barriers	PREMCI Activities Addressing the Barriers
Policy and Regulation	
Inadequate policies and regulatory frameworks	Activity 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1.1, 2.2.2, 2.2.3, 2.2.4, 3.1, 3.2, 3.3, 4.1, 4.3, 4.4, 4.5, 4.6, 4.7,
Production Technology and Application	
Lack of capacity to locally produce EE motors	Activity 2.1.1, 2.1.2, 2.1.2.1, 2.2.1, 2.2.1.2, 2.2.2, 2.2.3.1, 2.2.3.2, 2.2.4.2, 3.1, 3.2,
Financial support and access	
Shortage of financing for EE motors production and application	Activity 2.1.1.2, 2.1.3, 2.1.3.1, 2.2.3, 2.2.4.2, 3.1, 3.2, 3.3, 3.4
Information and promotion	
Low level of awareness about, and lack of accessible information on technologies and techniques in the design and production of EE motors (HEMs and REMs)	Activity 2.2.1.1, 2.2.1.2, 2.1.3, 2.2.2, 2.2.3.2, 2.2.4, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7

1.3. Stakeholder Analysis

12. During the conduct of the PPG activities, a number of government institutions, testing centers and private sector manufacturing companies were consulted about the PREMCI approach and the possible institutional arrangements. The stakeholders of this project include the relevant entities in the national and local governments that are involved in Science & Technology, and Industry & Information Technology matters; as well as those in the private sector (electrical appliance/equipment/machinery manufacturers, electric motor manufacturers, REM producers, electric motor parts suppliers, etc.), energy service companies (ESCOs); and regional organizations such as the International Copper Association (ICA). The following table lists down the stakeholders of the PREMCI Project and their respective roles during project implementation:

Table 4: Role of PREMCI Stakeholders

Stakeholder	Roles and Responsibilities in Project Implementation
Ministry of Industry and Information Technology	Lead agency for the implementation of projects in the industrial sector and the overall implementation and management of the project including communication and coordination with MOF and UNDP, providing staff and administrative support, liaison with local governments, project management and monitoring and project financial management.
Ministry of Science and Technology	Provision of technical support and assistance in the identification and design of demonstrations for the promotion of the production and application of EE motors (HEMs and REMs)
Standardization Administration of China	Provision of technical support and administrative assistance in the development and implementation of energy efficiency standards for EE motors

Stakeholder	Roles and Responsibilities in Project Implementation
Dept. of Energy Conservation in Local Governments(MIIT EMR pilot sites)	Provision of technical support and administrative assistance in capacity development and demonstration activities of the project in its pilot sites in cooperation with local governments
Pilot Enterprises on the production of (REMs)	Provision of plant space and direct technical and administrative assistance for pilot demonstration and the capacity development activities of the staff involved under the project
Electric motor industry association	Involvement in stakeholder meetings and consultations in policy making, regulatory framework and various activities of the project and provision of information regarding research and demonstration work on EE motor manufacturing, particularly on HEMs and REMs
Other private sector entities (e.g., electric motor parts suppliers)	Provision of information regarding the research work on alternative materials used in the parts and components of EE motors (HEMs and REMs) and related support services
International Copper Association	Provision of information and active involvement on the various projects on EE motors that have been carried out in China by the private sector, and other institutions (including ICA), as well as potential interventions in removing barriers to the development of the local EMR industry.
Energy Service Companies (ESCOs)	Provision of information, technical support and implementation on the development of standards for REMs, as well as in the design of technical training programs on the application and design of motor systems using HEMs and REMs.

The implementation of the PREMCI project will be fully coordinated with the other projects being implemented in China that are related to energy efficient appliances/equipment (focusing particularly on electric motors). These include:

- China Energy Efficiency Promotion in Industry Project (CEEPI) – This is a MIIT/WB/GEF project that focuses on promoting energy management systems and capacity building in industry. The policy research and formulation activities under the relevant component of the CEEPI Project that will address the policy barrier removal activities applicable for motors will be part of the baseline activities with regards to developing and enforcing the policies and regulations to be established under Component 1 of PREMCI.

- Motor Challenge Program (MCP) – This ongoing project is financed by the EU Switch Asian and focuses on promoting energy management schemes capacity building, such as energy standards development, energy management etc. MCP has energy efficiency capacity development activities that could be tapped and be the baseline also of the technical and information-related activities that are proposed under Component 4 of PREMCI.

- Barrier Removal to the Cost-effective Development and Implementation of Energy Efficiency Standards and Labeling (BRESL) Project – This is an ongoing UNDP-GEF project aimed at rapidly accelerating the adoption and implementation of energy standards and labels (ES&L) in Asia, and in so doing bring about energy savings from the use of selected energy efficient appliances/equipment (refrigerator, air conditioner, electric motor, electric fan, rice cooker, CFL and FL ballasts). While the BRESL Project has already been completed in December 2014, there are many outputs and experiences that can be useful for the PREMCI project in terms of reference testing protocols and EE performance standards for the said products that could be useful to motors, among other appliances and equipment in terms of the technical and information activities under Component 4 of this proposed GEF project. However, at this stage of completion, cannot be a baseline activity for PREMCI.

1.4. Baseline Analysis

13. The proposed project baseline primarily consists of the activities, projects and programs on energy efficiency improvements which are already on-going in China. Motor energy efficiency improvement is a key target area identified both in China's 11th and 12th Five-Year Plans. Some of the barrier removal and market development activities were initiated through the earlier China Energy Conservation Program which have already been completed. The Chinese government had implemented several energy efficiency improvement programs focused on electric motor system in the past, such as on the optimization of motor systems, fiscal subsidy program to HEMs production, the electromechanical products remanufacturing pilot project, the program of removing high energy consuming and outdated electromechanical equipment/products out of the directory and the application of variable speed control in motor systems in the industry sector. Most of the activities in this area were from the private sector, such as the China High Efficiency Promotion Project, China Motor Challenge Project, and Mechanisms for Adoption of Energy Efficient Motor Systems, Education and Training on Motor System Energy Conservation, Developing Training Materials on Motor Energy Conservation, and other similar projects.

14. Without the PREMCI Project, the practical/effective phasing-out of inefficient motors in China will be delayed more than 5 years at least. Lower efficiency motors will be continued to be produced in China and sold at low prices in countries which do not comprise of the technological, political and organizational development to implement lower efficiency motors phase-out policies. In the past more than 10 years, although the Chinese Government worked together with other stakeholders of relevant institutions, associations, universities, manufacturers and end-users to promote HEMs application, but the result of lower efficiency motors phase-out is so slow. There are now more than 90% of inefficiency motors in use. Without the PREMCI, REMs will be developed slowly because of lack of support organization and facilities for REM motor manufacturing.

15. The design of the proposed project was fully coordinated with the on-going projects and programs implemented in China that are related to energy efficient appliances/equipment (particularly electric motors) which will be considered as baseline projects of PREMCI. The following relevant electric motor efficiency improvement projects and programs of China that will complement PREMCI either as baseline projects (i.e., those that are ongoing) or rationale and sources of lessons learned (i.e., those that are already completed), for the PREMCI:

a) *Energy-saving Products Project Benefiting the People-Energy Efficiency Electric Motor Promotion (ESPBP-EMP)*

The ESPBP-MEP is an ongoing financial subsidy scheme, co-implemented by Ministry of Finance (MOF) and National Development and Reform Commission (NDRC) which started in year 2010, and aims at promoting high-efficient electric motors (HEMs) by providing subsidies for the purchase of HEMs from 12 CNY/kW to 60 CNY/kW. Three kinds of HEMs with rated capacity from 0.55-25,000 kW can get subsidies if they meet the relevant efficiency standards and requirements. However, the scheme turned out to be not effective because, on one hand it is not easy to obtain subsidies, especially for small and medium-sized motor enterprises, since the subsidy application procedure is complicated and time-consuming, On the other hand, production cost of HEMs is still high even if taking into account the subsidy compared to the least costly standard electric motors which can be rewound if they get burnt out. Furthermore, clearly the motor efficiency is not a major concern among the users for the time being. The issues faced by the subsidy scheme will be seriously considered and properly addressed under the proposed GEF project.

b) Electric Motor Energy Efficiency Improvement Program (EMEEIP)

The EMEEIP was launched by Ministry of Industry and Information Technology (MIIT) and General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ) in June 2013 that intends to push forward HEMs development and application, promote upgrading of motor producing industry, and comprehensively improve motor efficiency to achieve energy-saving and emission reductions. The EMEEIP addresses 4 aspects consisting of a.) Speed-up of HEMs promotion; b.) Phase-out of low efficient electric motor; c.) Implement of energy-saving technological retrofit for electric motor system; and d.) Implement high-efficiency electric motor remanufacturing. The EMEEIP is a general plan, the actions taken and support offered for which are limited and insufficient to remove the identified barriers. Hence there are good entry points for the proposed GEF project build on the results of the EMEEIP, by introducing interventions with respect of policy, financial support, technical and information barrier removal activities to realize increased manufacturing and widespread application of EE electric motors in China.

c) China Energy Efficiency Promotion in Industry Project (CEEPI)

The CEEPI is a MIIT/WB/GEF project that focuses on promoting energy management systems and capacity building in industry, to improve energy efficiency and reduce GHG emissions in key industrial sectors in China. It is comprised of 4 components: a.) policy support for energy efficiency improvements in enterprises; b.) capacity building for energy managers and energy management training institutions; c.) EE application demos in key energy consuming enterprises in energy intensive industries; and, d.) information dissemination to enhance energy management awareness of industrial enterprises. Among the systems covered in the project is electric motors systems which are responsible for major industrial electricity consumption; the improvement of their efficiency will play an important role in energy management in industry, so obviously the implementation of the PREMCI will further enhance energy management capacity and level of industrial enterprises. To achieve synergistic effects, energy management will be taken into consideration when conducting policy research in the PREMCI project.

d) Motor Challenge Program (MCP)

This was an EU Switch Asian-financed program for assisting industrial users of electric motor systems in switching to high-efficiency motor system and further achieve a far-reaching impact in the demand for high-efficiency motor systems. The program produced results that can be used as good foundation for the PREMCI project design. For example, one of the MCP achievement was the China Motor Systems Challenge Club which will be the model for the Electric Motor Industry Alliance that the PREMCI project intends to create.

e) Barrier Removal to the Cost-effective Development and Implementation of Energy Efficiency Standards and Labeling Project (BRESL)

This is an ongoing UNDP-GEF project aimed at rapidly accelerating the adoption and implementation of energy efficiency standards and labels (EES&L) in Asia, and in so doing bring about energy savings from the use of selected energy efficient appliances/equipment, which include electric motors. The PREMCI project will endeavor the remaining issues concerning EES&L in electric motors that were not adequately covered in BRESL. The proposed project will use the information dissemination network established by BRESL to spread in particular local EE motors market and product performance information more extensively.

f) Electromechanical Products Remanufacturing Pilot Project – This MIIT project focuses on the remanufacturing of old electromechanical products and improving their efficiency.

To date, the MIIT has supported 3 electric motor companies in Anhui (*Anhui Wannan Electric Machine Co. Ltd);* Hunan *(Xiangtan Electric Manufacturing Co. Ltd); and,* Xian *(Xi'an SIMO Motor, Inc.*), and a research institution in electric motor remanufacturing (EMR). In September 2012, the Shanghai Government implemented the "*Detailed plan of promoting the implementation of high-efficiency electric motor remanufacturing in Shanghai*". This scheme involves the provision of subsidy of 45 CNY per kW for the purchase and use of REMs. Additionally, this scheme also includes the incentive mechanism for old electric motor replacement at 20 CNY per kW. The objective of Shanghai's plan is the diffusion of 2 million kW (2,000 MW) HEMs by 2012 and 8 million kW (8,000 MW) HEMs (including 2.4 million high-efficiency REMs) by 2015. This program targets achieving HEM application of about 20% of the total installed capacity of electric motors by the end of 12th Five-Year Plan[4]. Because of this, there is large market potential for old electric motor replacement.

16. The PREMCI Project Development Team (PDT) consulted with the key stakeholders of the abovementioned projects and found potential synergies and complementarity, as well as best practices and lessons learned from these projects. PREMCI has been designed to ensure and further strengthen the coordination among the implementers of these projects/programs. Full interaction and consultation with the implementing agencies of the other projects/programs will continue in the process of implementing every barrier removal or capacity building activity of the PREMCI to motivate the private sector in the EE motor production and application in China.

17. China Motor Energy Efficiency Improvement Program – This is a program that is comprised of ongoing electric motor projects carried out by various national and local government entities. Table 5 lists all of these ongoing projects whose entire or some of their activities are subsumed into PREMCI as baseline activities and the corresponding budget of such activities are regarded as co-financing to the PREMCI Project.

Table 5: Baseline Projects & Activities

Program/Project	Owner/Funder	Subsumed Activities	PREMCI Output
China Motor Energy Efficiency Improvement Program	Ministry of Industry and Information Technology	All related activities for improving energy efficiency of electric motors	Updated policies and enforcement
	Shandong Provincial Government	EMR pilot program	Application of lessons learned and promotion from pilot projects
	Hunan Provincial Government	EMR pilot program	Application of lessons learned and promotion from pilot projects
	Shanghai Municipal Government	EE motor promotion and R&D	Application of lessons learned and promotion from pilot projects
	Anhui Provincial Government	EMR pilot program	Application of lessons learned and promotion from pilot projects
	Ministry of Industry and Information Technology	EE motor rebate scheme, REMs standards, REMs certification system	Developed and implemented suitable business model for local banks/financial institutions

[4] In May 2012, China decided to continue the implementation of the financial subsidy scheme for HEMs with the support funding of 1.6 billion CNY.

Program/Project	Owner/Funder	Subsumed Activities	PREMCI Output
			to support EE motors production and application
	Shandong Provincial Government	REMs manufacturing demonstration	Completed demonstration of improved EE motor product design and manufacturing
	Hunan Provincial Government	REMs manufacturing demonstration	Completed demonstration of improved EE motor product design and manufacturing
	Shanghai Municipal Government	REMs product R&D, EE motor rebate scheme, REMs research center, REMs testing facility	Established and enforced incentive mechanisms, e.g. rebates; EE motors application system testing and certification system
	Anhui Provincial Government	REMs manufacturing demonstration, REMs testing facility	Completed demonstration of improved EE motor product design and manufacturing
Electromechanical Products Remanufacturing Pilot Project	Ministry of Industry and Information Technology	Relevant EE motor efficiency activities particularly related to remanufacturing	Recommended policies and implementing rules and regulations on the development and support of the local EMR industry
Fiscal Subsidy Program for HEMs Production	National Development & Reform Commission Ministry of Finance	Relevant policies and enforcement activities for improving HEM energy efficiency and application	Developed and implemented suitable business model for local banks/financial institutions to support EE motors production and application

18. The Chinese government had in the past implemented, and is currently implementing, several energy efficiency improvement programs focused on electric motors. These include the optimization of electric motor systems and the application of variable speed control in motor systems in the industry sector. However, there are very limited GOC-led interventions for improving the energy efficiency for locally made electric motors. Apart from the previous projects funded by organizations such as the Energy Foundation and UNIDO, most of the activities in this area are from the private sector, e.g., the International Copper Association. R&D in the area of EE electric motors is currently limited to individual efforts of electric motor manufacturers and the application of advanced technologies are constrained by lack of investment due to inadequate support and enforced policies that could spur interest and confidence of investors and in particular the industrial users of electric motors. The current China Motor Energy Efficiency Improvement Program (CMEEIP)[5] involves various interventions that are intended to promote the development and widespread use of EE electric motors, which are the high efficiency motors (HEMs) and remanufactured electric motors (REMs). Most of these efforts by the government (through MIIT) on electric motors are for the electric motor users. So far, very few local electric motor manufacturers have shown interest in venturing to the production of EE

[5] The China Motor Energy Efficiency Improvement Program consists of the following sub-programs: (a) MIIT (China Motor Energy Efficiency Improving Program); (b) Shandong Provincial Government (EMR pilot program); (c) Hunan Provincial Government (EMR pilot program); (d) Shanghai Municipal Government (EE motor promotion and R&D); (e) Anhui Provincial Government (EMR pilot program); (f) MIIT (EE motor rebate scheme, REMs standards, REMs certification system); (g) Shandong Provincial Government (REMs manufacturing demonstration); (h) Hunan Provincial Government (REMs manufacturing demonstration); (i) Shanghai Municipal Government (REMs product R&D, EE motor rebate scheme, REMs research center, REMs testing facility); and, (j) Anhui Provincial Government (REMs manufacturing demonstration, REMs testing facility).

motors (particularly HEMs). Converting existing standard electric motor production line for EE motor production is currently not economically feasible for the over 2,000 electric motor manufacturers in China. The other government programs on promoting the development and widespread utilization of EE electric motors are the (a) Electromechanical Products Remanufacturing Pilot Project (MIIT); and, (b) Fiscal Subsidy Program for HEMs Production (NDRC and MOF). The MIIT's Electromechanical Products Remanufacturing Pilot Project that is implemented nationwide focuses on the remanufacturing of old electromechanical products and improving their efficiency. Under this project, the MIIT is currently supporting 3 electric motor companies in Anhui (*Anhui Wannan Electric Machine Co. Ltd);* Hunan *(Xiangtan Electric Manufacturing Co. Ltd); and,* Xian *(Xi'an SIMO Motor, Inc.*), and a research institution in electric motor remanufacturing (EMR)[6].

19. The following are some of the most recent implementation highlights of the abovementioned initiatives of the government:

- Implementation by the Shanghai Municipal Government of the "Detailed plan of promoting the implementation of high-efficiency electric motor remanufacturing in Shanghai" in September 2012.
- Joint issuance by the MIIT and AQSIQ of the organization and implementation of the electric motor efficiency enhancement program in June 2013.
- MIIT and AQSIQ, in cooperation with motor manufacturers, carried out an EE standards and labelling activity to verify achievements made under the CMEEIP.
- Completion of a national catalog of advanced technology in electric motors in July 2014 (MIIT)
- Completion of a national electric motor energy efficiency improvement conference in December 2014 (MIIT).
- Completion of two national conferences on: (1) electric motor efficiency improvement (May 2014); and (2) electric energy technology promotion (July). These were organized by MIIT and the electric motor industry alliance)
- Completion of an international workshop on energy efficient electric motors in July.
- At the local level implementation of the CMEEIP, several initiatives towards the enforcement of electric motor system efficiency improvements have been accomplished in line with the national direction.

20. Bulk of the activities in the EMR field is still on research and development of EMR techniques. At present, the EMR production capacity and annual sales of REMs are still negligible compared to that of the standard electric motor manufacturing industry. In December 2014, under the Electromechanical Products Remanufacturing Pilot Project, MIIT issued a directive to further improve on the experience derived from the piloting of motor remanufacturing based on the first batch of remanufactured units from pre-identified 35 companies.

21. The NDRC and MOF implemented Fiscal Subsidy Program is still ongoing. NDRC and MOF have recently issued subsidy funds for additional six (6) batches of electric motor products. The new subsidies include that for energy-efficient small and medium 3-phase asynchronous motors (RMB 15-40/kW); for large 3-phase asynchronous motors (RMB 12/kW); and for 3-phase rare earth permanent magnet synchronous motors (RMB 40-60/kW).

22. While some progress have been made, this has been at best very modest. The electric motor industry in the country is still beset with barriers that hampers the development of

[6] The current EE electric motor sales (in kW) of these 3 companies are: (a) Anhui Wannan Electric Corp – 890 kW (high-voltage HEMs); (b) Hunan Electric Group Co., Ltd. - 2,686,600 kW (HEMs); (c) Shanghai Motor System Energy Saving Engineering Technology Research Center Co., Ltd. - 7,848.3 kW (REMs).

the EE electric motors business in the country. Nonetheless, with the continued support from the GOC in promoting the increased level of production and application of HEMs, as well as in propping up the EMR industry (even without PREMCI), the previously anticipated low percentage of local electric motor manufacturers in China producing HEMs and REMs by EOP (i.e., energy efficient electric motors) by 2020 may still be expected.

2. STRATEGY

2.1 Project Rationale and Policy Conformity

23. The basic concept of this proposed GEF-supported alternative to the baseline scenario as described above is the facilitation of the achievement of energy efficiency benefits from using EE Motors to realize further reduction of GHG emissions associated from the generation of the electricity that would be saved from the use of EE motors. The idea is to enable enhancement in the manufacturing and widespread application of energy efficient electric motors in China through the effective promotion and extensive application of high efficiency motors (HEMs) and remanufactured motors (REMs) in Chinese industries. Although a dozen years ago HEMs started to appear in the Chinese market, most end users have little understanding of high efficiency motors and their level of awareness of the use and benefits of HEMs is relatively low and has to be strengthened. Particularly, some energy intensive industries have little knowledge of how to select HEMs and how to evaluate their economic benefits.
24. Based on the extensive consultations made with the public and private sectors, the general approach that will be applied will be the removal of barriers in 4 identified areas for improvement: a) Policy and regulatory frameworks on the production and application of EE motor; b) EE motor production and application; c) Financial support and accessibility; and d) EE motors Promotion.

25. The barrier removal approach is two-pronged: 1) Addressing the barriers to new EE motor production and application; and 2) Phasing out of old inefficient motors or their conversion (or remanufacturing) to better and more energy efficient motors. Thus, by end-of-project, it is expected that there will be relatively more EE motors that are manufactured, sold and used in China, and more existing energy inefficient electric motors are expected be phased-out. Furthermore, there is a need for the project to address the retiring or remanufacturing the existing old inefficient electric motors to give way for more efficient motors or also referred to as remanufactured electric motors (REMs) through the efforts of the emerging electric motor remanufacturing (EMR) industry. To do this, the GOC (national and local) has to programmatically and effectively pay attention to the current limitations of the EMR industry in regards techniques and financial support for REMs. Otherwise, the EMR industry will take a very long time to develop and become a robust and thriving commercial sector of the national economy, since the existing energy inefficient electric motors are less likely to be replaced or retrofitted (as per the business-as–usual scenario for the industry).

26. Considering the current trend and practices of using electric motors, the potential for utilizing locally made energy efficient units (HEMs and REMs) will not be realized if the proposed project will not materialize. The potential energy saving and energy cost savings that can be derived from the use EE motors in the country (particularly in the industries) will not be realized without the removal of certain barriers that hinder the promotion, production and utilization of EE motors (HEMs and REMs) in the country. While the country has already initiated policies and actions to promote EE motors production and utilization in the country, and there are other ongoing broad energy efficiency programs that have components on energy efficient electric motors and motor systems, these rather limited and general actions are not sufficient to remove the identified barriers, create and sustain enabling environments, and facilitate or at least influence the increased investments in EE

motor production and their widespread application in industries . Without GEF support for funding the incremental cost for removing the barriers that this proposed project will address, the expected potential additional global environmental benefits (in terms of avoided CO_2 emissions linked from the electricity that will be saved) would not be realized. Without this proposed project, China would have limited success in promoting the widespread utilization of EE motors, especially for the REMs; in increasing use of the HEMs; and, in the phasing-out of existing energy inefficient electric motors. Such efforts will be at a relative low level, and in so doing, the potential contribution to the country's GHG emissions reduction targets as well as the country's aim to conserve energy and protect both the global and local environment will not be fully realized. With the GEF support for the incremental cost needed to create the much needed market pull and technology push to remove the barriers that will in turn facilitate the increased share of HEMs and REMs in the local electric motor market, and in so doing, realize the expected global environmental benefits of reducing GHG emissions (from energy savings derived from the widespread use EE motors.

27. The project is consistent with China's national energy strategy and planning. China's 12th Five-Year Plan (2011 to 2015) clearly states the strategies and guidelines for developing a resource-conserving and environment-friendly society. The objective of Energy-Saving and Emission-Reduction aims to further reducing energy use intensity aiming for the reduction of the energy consumption per 10,000 GDP (CNY) from 1.032 tce in 2011 to 0.869 tce in 2015. That will translate to an energy saving of 670 million tce to be achieved during 12th Five-Year Plan period. Specifically for the electric motors industry, the Industrial Energy-Saving 12th Five-Year Plan published by the Ministry of Industry and Information Technology (MIIT) indicates that by 2015 the application of Grade 2 efficiency electric motors shall reach 80%, with a consequent power saving from electric motor system increase of about 2% to 3%. In this regard, the proposed project is fully consistent with China's national strategies and will contribute to the achievement of the national energy saving targets.

28. The objective or purpose of PREMCI is aligned with GEF-5 Climate Change Mitigation Focal Area Objective No. 2 (CCM-2) which is to: *Promote Market Transformation for Energy Efficiency in Industry and the Building Sector* and will contribute to the reduction of greenhouse gas emissions through the transformation of the electric motor market in China towards more energy-efficient electric motors used in the major end-use sectors of the country, particularly the industrial sector. The project focuses on the removal of barriers to the development of the electric motor remanufacturing industry in China, and on interventions that serve as "market pull" to achieve widespread adoption of energy efficient remanufactured electric motors in Chinese industries.

29. Thus, PREMCI's goal falls within the following GEF Expected Focal Area Outcomes and Outputs:

- GEF 5 Outcome 2.1: Appropriate policy, legal and regulatory frameworks adopted and enforced
  - Output 2.1: Energy efficiency policy and regulation in place

- GEF 5 Outcome 2.2: Sustainable financing and delivery mechanisms established and operational
  - Output 2.2: Investment mobilized
  - Output 2.3: Energy savings achieved

30. With the rapid development of China's economy in the 21st century, the development of motor industry has entered the rapid growth stage. The production of motors has increased at an average annual rate of 15%. It is estimated that in 2011, the installed capacity of

electric motor is about 1.7 billion kW. According to the international estimation method, the general motor installed capacity is 2.5 ~ 3.5 times power generator installed capacity. Based on the calculation, motor production also will continue to increase rapidly, in the next ten years; the capacity of the motor produced will increase to 4.5-5.0 billion kW.

31. The project offers to push the market development for EE Motors through: a.) Enhancing and clearly defining policy enforcement mechanisms on the production EE motors and their applications in the Chinese industrial sector; b.) Increasing local production of EE motors for applications in Chinese industries; c.) Increasing application of domestically produced EE Motors (HEMs and REMs) in Chinese industries; and d.) Increasing market share of energy efficient electric motors.

32. There is a great market potential with increased production and sale of EE Motors in China. It is estimated that in 2011, electric motor systems accounted for an estimated 64% of China's total annual electricity consumption, or about 3 trillion kWh with the installed capacity of 1.7 billion kW. On average, locally produced electric motors in China typically have efficiencies that are lower by approximately 3 to 5 percentage points than those in the developed countries such as the U.S.A. and Canada. It has been estimated that there can be 26 billion kWh (26,000 GWh) annual electricity saving amount for every 1% efficiency improvement in electric motors. In this regard, the country has ample reasons and opportunities to improve the efficiency of locally designed and manufactured electric motors.

33. The capabilities of the local electric motor manufacturers need to be enhanced in producing EE motors according to set international efficiency performance standards. They should be trained in the R&D on the technologies of new high efficiency motor products and efficient materials, motor system adaptability reform key technology, energy efficient remanufacturing, motor system energy consumption diagnosis and evaluation of system energy saving effect test. In the same token, support from importers, distributors and service providers should be mobilized in adopting and applying these EE standards in the exported and imported electric motors as well. They should understand the requirement of the new EE standard and the benefit of the EE motor first, and then they should positively buy EE motor for their projects. To create market demand is the assistance which the industry manufacturers need. The PREMCI project will consists, among others, the conduct of market campaigns, industrial consumer education campaigns on EE motor applications, and regular information dissemination of EE motor technologies, business opportunities, success stories, and best practices.

34. The information dissemination and training activities to be developed and implemented for the industry players for them to participate effectively include updated information on technically and economically feasible EE technologies; coordination and development of energy efficiency standards; available technical assistance; financing facilities to support the manufacturers to implement the EE motor production activities and awareness program.

2.2 Country Ownership/Country Eligibility

35. China ratified the UNFCCC on 5 January 1993. It has completed and submitted its Second National Communications to the UNFCCC, which highlighted that EC&EE, in general, and EE motors, in particular and among the measures each country are considering for the reduction of GHG emissions.

2.3 Country Drivenness

36. Stakeholders' consultations have been held in conjunction with the LFA exercise that was conducted to come up with the project framework design. These were also carried out to obtain key electric motor manufacturers and other stakeholder input regarding project-related issues, concerns, and barriers regarding development, commercialization, and marketing of high EE motors and REM products. This exercise was the basis for the activities proposed to be carried out under the PREMCI Project, including project implementation and management arrangements.

37. As discussed in the sections above, the PREMCI Project is closely aligned with other government initiatives that are also supported by UNDP and/or GEF, particularly the BRESL Project and other related regional and bilateral projects in a strategic, integrated and synergistic approach. These undertakings all demonstrate China's drive and commitment to further pursue a highly complementary project on electric motor energy efficiency. The relevant government agencies and electric motor industry manufacturers have been adequately consulted and have proactively identified barriers that could affect the successful implementation and achievement of PREMCI's program and goals. Said consultation workshop also came up with the national activities that are proposed to be carried out under the PREMCI Project, including the project implementation and management arrangements.

2.4 Design Principles and Strategic Considerations

38. *Proposed Alternative Scenario:* The objective of the proposed project is to ***enhance the manufacturing and widespread application of energy efficient electric motors in China***. To achieve this, the identified barriers to the effective promotion and extensive application of HEMs and REMs in Chinese industries have to be removed. Thus a barrier removal approach will be applied[7].

39. Advanced EE motors production techniques can now increase the energy efficiency of electric motors by 2% or more thereby meeting the Grade 2 requirement under the China Standards (GB18613-2006) for electric motors. The typical efficiency of SEMs is 87%, while that of EE motors (HEM/REM) is 90.1%. Hence, if the manufacturing process is performed properly employing advanced technologies and techniques and in qualified and competent EE motor production facilities, relatively low cost and high quality EE motors (HEMs and REMs) can become available in the local electric motor market. The utilization of EE motors is expected to bring about large gains in electricity savings in the operation of electric motor systems in industries. This translates to benefits to the global environment, as well as to China's economy and local environment given the significant economic cost and local pollution associated with power generation and consumption. For illustrative purposes, Table 6 below shows the annual energy savings and GHG emission reduction in replacing an existing 7.5 kW SEM with a new EE motor (HEM/REM) of the same size or buying a new 7.5 kW EE Motor (HEM/REM) instead of a 7.5 kW SEM. The unit price of HEMs range from 1.4 to1.5 of the SEM unit price, while that of REMs is typically 80% to 90% of the cost of HEMs.

[7] For this project, the barrier removal approach is considered more appropriate, holistic and cost effective, because: (1) Electric motors are commonly used in almost all economic sectors (particularly the industry sector) of the country; (2) The country has a big electric motor industry that caters to both the domestic and export markets; (3) Energy efficient (according to the China Standards - GB18613-2012) electric motors are manufactured in the country, albeit at a lower production rate compared to that of standard electric motors; and, (4) Locally made EE motors have relatively low efficiencies compared to foreign brands. Only limited success can be expected if the option of just relying on individual consumers switching to energy efficient motors is considered. The impacts would also be limited to those that are directly involved in individual and uncoordinated EE motor (HEM and REM) application initiatives, compared to the proposed approach, which includes a program for disseminating the results and lessons identified.

Table 6: Economic & Environmental Viability of Energy Efficient Electric Motors (HEM & REM)

Particulars	HEM (η = 90.1%)			REM (η = 90.1%)		
Unit Price, CNY	2000			1700		
Annual Operation hours	3000	5000	8000	3000	5000	8000
Annual Electricity Savings, kWh	890	1483	2373	890	1483	2373
Annual Electricity Cost Savings (CNY)	712	1186	1898	712	1186	1898
Annual GHG Emission Reduction, kg CO2	938	1563	2501	938	1563	2501
Case A: Replacement of Existing SEM with New EE Motor (HEM/REM)						
Investment Payback Period, yrs	2.8	1.7	1.1	2.4	1.4	0.9
Case B: Buying a New EE Motor (HEM/REM) Instead of a New SEM						
Incremental Price (compared to SEM), CNY	571			271		
Incremental Investment Payback Period, yrs	0.8	0.5	0.3	0.4	0.2	0.1
Basis: SEM, Typical Efficiency (η) = 87.0%, Unit Price = CNY 1429						
China Grid Emmission Factor = 1.054 kg CO2/kWh (Ave. Operating Margin EF, IGES Mar 2013)						

40. From the above table, it makes sense to invest in an EE motor (HEM/REM) when there is the opportunity to replace an existing SEM or buying a new electric motor. Based on the resulting energy savings and associated GHG emission reduction from using an EE motor, this can translate to significant quantities nationwide if the local electric motor market is transformed towards wider production and sale of EE motors. The potential electricity savings and consequent GHG emission reductions from the use of locally made EE motors will be estimated in more detail during the project design and preparation stage.

41. The project will address current teething problems in the nascent EMR industry in China which focuses on the recycling/repowering of old or broken/burnout electric motors and improving their energy efficiency[8]; as well as retrofitting the existing less energy efficient standard electric motors to turn them into high efficiency REMs. The proposed project will focus on removing a number of key barriers in the local electric motor industry. A combination of “technology push” and “market pull” activities will be employed to enhance the energy efficiency levels of HEMs and REMs that are locally produced in China by facilitating/enabling the effective promotion and application of advanced EE motor production and application technologies and techniques.

42. Through this combination of measures, the MIIT expects that by the end-of-project, at least 40% of the local electric motor manufacturers in China will produce HEMs and REMs that are compliant with at least the mid-level Grade 2 requirement under the China Standards (GB18613-2006) for electric motors, or better still be at par with foreign-made HEMs & REMs. The proposed GEF project will facilitate/influence, and contribute to, the realization of this impact. It is estimated that the HEM production output will reach 89 million kW annually by 2019. At the same time, the forecast REM production output is about 4 million kW. Moreover, more than 60 million kW of low-efficiency electric motor will be phased-out annually by the end of this project. A cumulative total of about 160 million kW of the low-efficiency electric motors will be phased-out within the project period.

43. PREMCI will achieve the goal under the Alternative Scenario from the realization of the associated CO_2 emissions from the electricity saved by EE motors. This is the CO_2 avoided from the generation of the electricity savings. Energy efficiency improvement has been demonstrated to be one of the most economical and effective means of reducing GHG

[8] In case of an electric motor breakdown/burnout, the common practice in China is to repair the broken electric motor (rewinding) thus avoiding higher investments in a new one. Some electric motors are rewound for multiple times before they are finally scrapped. From an efficiency point of view, rewinding can be bad for two reasons: (1) The older less efficient electric motor will continue to be used for a much longer time; and, (2) Rewinding often comes with a loss of efficiency of 1 to 3%.

emissions. As discussed above, complementation in terms of additional features will be incorporated not only in the electric motor production systems but also more importantly in the EE motors produced that are definitely of higher energy efficiency performance levels.

44. *Project Components:* PREMCI is comprised of the following components that will address the identified barriers to the manufacture, sale and use of energy efficient (EE) Electric Motors:

- **Component 1: Policy and Regulatory Frameworks on the Production and Application of EE motors** – This component will address the barrier related to the inadequate policies and regulatory frameworks that support the promotion and application of EE motors (HEMs and REMs) in Chinese industries. A situation wherein there will be enhanced and clearly defined, and enforced policies and regulations on the more stringent application of EE motors in the Chinese industries is the expected outcome from the envisioned activities under this component. This component will involve working with the MIIT on the enhancement of the current policies on EE motors.

- **Component 2: EE Motors Production and Applications** – This component is meant to address the barrier regarding the lack of local expertise in cost-effective design and production of HEMs including REMs and enhancing the capacity of the testing and certification system for electric motors. It is expected that with the interventions that will be carried out under this component, more locally made EE motors (HEMs & REMs) will be available in the local market, and consequently increased applications of EE motors in Chinese industries The activities that will be carried out under this component will be in cooperation with the local electric motor manufacturers that are interested in venturing into the production and sales of EE motors, as well as the existing EE motor producers. They will also be coordinated with ongoing projects/programs on energy efficiency standards for electric motors. In particular, the technical capacity development for local electric motor manufacturers and the pilot REM producers that are currently being supported by the MIIT program on EMR will be coordinated to make use of the potential synergies. One of the major capacity development activities will be on the demonstration of the application of improved EE motor product design and manufacturing. This will involve the provision of technical assistance to selected electric motor manufacturers and pilot REM producers on the design and manufacturing of REMs, the prototype production of selected EE motor designs, including EE motor product testing. The results of the capacity development activities and demonstrations of the application of energy efficient EE motor designs and production will be published and disseminated to other local electric motor manufacturers.

- **Component 3: Financial Support & Accessibility Improvement** - This component is primarily aimed at addressing the lack of access to financing for EE motor (HEM and REM) production and application. The expected outcome from achievement of the deliverables under this component is the improved availability and accessibility of financial support for EE motor production and applications. The envisioned activities will be based on the results of the conduct of the techno-economic feasibility analyses and the preparation of the action plan for financing EE motor initiatives of local electric motor manufacturers and suppliers that will lead to the development and implementation of suitable business models for local financial institutions to support EE motors manufacturing, as well as efforts to use EE motors in industries.

- **Component 4: EE Motors Promotion** – This component will consist of "market pull" activities, which are aimed at removing barrier concerning the low level of awareness

about, and lack of accessible information on, technologies and techniques in the design and production of REMs. The successful completion of the envisioned activities under this component will contribute achieving an increased share for EE motors in the local electric motor market. Among the activities under this component is the establishment and operationalization of an electric motor market monitoring system. Clearly, the facilitation of the exchange/sharing of information through yearly meetings of concerned organizations and individuals in the electric motor industry on EE motor technologies, business opportunities, success stories, and best practices in the industry, is the main strategy to remove the awareness and information-related barriers.

45. *Expected Outcomes:* The significant developments in terms of outcomes that will be manifested in the realization of the PREMCI Alternative Scenario and the outputs that are expected are as follows:

a) Enhanced and clearly defined policy enforcement mechanisms on the production EE motors and their applications in the Chinese industrial sector.

1) Completed survey of the local electric motor market in China;
2) Completed review of existing policies and regulations applicable to EE motors applications in industries in China;
3) Recommended policies and implementing rules and regulations on EE motors production and their application in the Chinese industries taking into consideration all the past and ongoing programs in China and many other global experiences;
4) Recommended policies and implementing rules and regulations on the development and support of the local EMR industry;
5) Recommended policies and implementing rules and regulations for the phasing out (including appropriate support measures) of existing low efficiency electric motors;
6) Established recommended system for EE system performance standards, testing protocol, and certification system. .
7) Enforced implementing rules and mechanisms for the approved policies & regulations on EE electric motors production and application.
8) Established M&E and improvement system on the enforcement of the approved policies and regulations on EE motors production and application.
9) Investment plans for EE motor production by new local electric motor manufacturers who were motivated and influenced by the enforced policies and regulations.

b) Increased local production of EE motors for applications in Chinese industries.

1) Developed capacity development program for local EE motor (HEM and REM) manufacturers;
2) Completed training courses for local electric motor manufacturers on the design and manufacturing of EE motors (HEMs and REMs);
3) Disseminated information on improved EE motor product design and production;
4) Established and operational EE motor research center and EE motor industry association.
5) Completed demonstration of improved EE motor product design and manufacturing;
6) Commercialized REM products;
7) Established and enforced EE motors application system testing and certification system.

c) Increased application of domestically produced EE Motors (HEMs and REMs) in Chinese industries.

1) Completed techno-economic feasibility assessment and action plan for financing improved EE motor initiatives of local electric motor manufacturers and suppliers
2) Developed and implemented action plan for financing improved EE motor initiatives of local electric motor manufacturers and suppliers
3) Developed and implemented suitable business model for local banks/financial institutions to support EE motors production and application
4) Operational appropriate EE motor incentive mechanism

d) Increased market share of energy efficient electric motors

1) Established and operational electric motor market monitoring system;
2) Regularly disseminated publication of local EE motors market and product performance Information;
3) Established guidelines for EE motor (HEM &REM) procurement system;
4) Operational EE motor (HEM and REM) manufacturer incentive program
5) Completed industrial consumer education campaigns on EE motor (HEM and REM) applications;
6) Sustainable follow-up plan for the replication of the project interventions in other cities in collaboration with electric motor manufacturers in other Chinese cities.

46. *Comparative Advantage of UNDP to Implement the PREMCI Project:* This project contributes to the achievement of the outcome - energy efficiency in industry and the building sectors as stated in the UNDP-China Country Program Document 2011 – 2015. It also contributes to the achievement of the primary outcome - Environmental protection, climate change, and natural resource management on Environment and Sustainable Development, as mentioned in the UNDAF 2011-2015. Moreover, this program is directly in line with the UNDP EITT's signature program on low emission urban and transport infrastructure, specifically focusing on GHG emission reduction from electric motor systems in Chinese industries. With its country presence, UNDP-China is well-positioned to implement this proposed project as it has, and currently have, a proven track record of successful implementation of energy efficiency projects in the country, as well as in other developing countries in Asia. The optimization and improvement of the energy performance of energy consuming equipment and electric motor-driven systems are included in most of these energy efficiency projects carried out in industries and buildings.

47. UNDP also has sufficient staff complement that can effectively supervise the design and implementation of this project. The fact that it is one of the leading UN agency in China supporting the GOC in addressing climate change issues in the country; its staff members' substantial experience in the successful implementation of GEF-funded projects in the country; and its overall substantial experience and expertise in working in partnership at the decentralized level with local communities, private sector, policy makers and civil society, justify its capacity and qualification to implement this proposed project. Moreover, for this project, UNDP-China will be backstopped by technical expertise available in the UNDP Asia-Pacific Resource Centre (APRC) in Bangkok, Thailand.

2.5 Alternative Scenario

48. Assuming the four-year project will start 2016, PREMCI is expected to contribute annual electricity savings of 5,559 GWh/yr by 2019 or at the end of the project in Year 4 and 34,035 GWh/yr in 2029 or 10 years after the project. The equivalent reduction of CO_2 emissions is estimated at 4,447 kilotons (ktons) CO_2 per year in 2019 and 27,228 ktons CO_2 per year in 2029. Cumulatively, reduction of CO_2 emissions amounts to 7,986 ktons CO_2 by 2019 and 152,976 ktons CO_2 by 2029. More details are seen in **Annex III**.

Table 7: Summary of Expected Results of Baseline and Alternative Scenarios

Particulars	2019 End of project Year 4	2029 10 yrs after EOP	2035 15 yrs after EOP
Baseline electricity consumption *(GWh/yr)*	513,005	1,303,491	2,280,866
Alternative electricity consumption *(GWh/yr)*	507,447	1,269,456	2,200,665
Annual Electricity Savings, *GWh/yr*	5,559	34,035	80,201
Annual reduction of GHG emissions, *ktons CO_2/yr*	4,447	27,228	64,161
Cumulative reduction of GHG emissions, *ktons CO_2*	7,986	152,976	432,290

49. The annual electricity consumption for electric motor operations under the Baseline and the Alternative Scenarios in the Chinese industry sector were calculated to estimate the savings resulting from the PREMCI intervention. The results are presented in **Figure 1** which is a graphical presentation of the baseline year 2013, projected 2014 -2019 (PREMCI Project implementation period), projected 2029 (ten years after the project) and projected 2035 (15 years after the project).

2.6 PREMCI Goal, Objectives, Outcomes and Outputs/Activities

50. The overall goal of PREMCI is reduction of greenhouse gas (GHG) emissions in China's industry sector. The PREMCI intends to facilitate the realization of such potential by removing the identified barriers that up until now has not been totally prevented China from realizing substantial GHG emission reductions that would contribute to the achievement of the countries climate change mitigation targets. Based on the resulting energy savings and associated GHG emission reduction from using an EE motor, this can translate to significant quantities nationwide if the local electric motor market is transformed towards wider production and sale of EE motors. Energy efficiency improvement has been demonstrated to be one of the most economical and effective means of reducing GHG emissions.

51. The main objective of the PREMCI Project is the **increased manufacturing and widespread application of energy efficient electric motors[9] in China**

52. List and Description of Major Outputs, Activities and Sub-activities under each Component

53. The barrier removal activities in each of the project component comprise the incremental activities of the proposed project that will either be fully or partly funded by GEF resources.

[9]Energy efficient electric motors (EE Motors) include both high efficiency motors (HEMs) and remanufactured electric motors (REMs). Electric motor remanufacturing (EMR) involves the retrofitting of low-efficiency electric motors through redesign, parts replacement and application of advanced electric motor techniques to produce high-efficiency remanufactured electric motors (REMs). The difference between EMR and electric motor rewinding is that the former results in a product (i.e., REM) that has higher efficiency than the original electric motor, while the latter results in the restoration of the operational functions of the original electric motor but at the expense of, at best, a unit percentage reduction in efficiency. Electric motor rewinding is the traditional way of extending the life of electric motors and is done to burned-out electric motors.

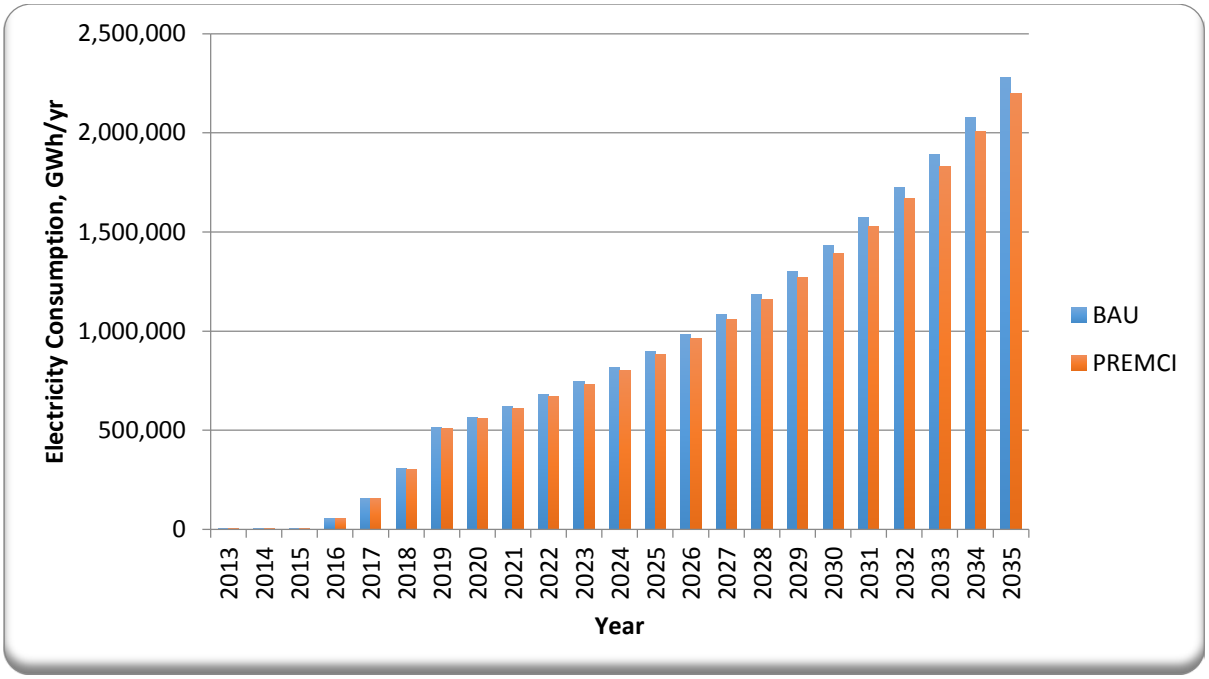

Figure 1: Graphical Summary of Expected Annual Electric Motor Electricity Consumption in the Chinese Industry Sector under Baseline and Alternative Scenarios

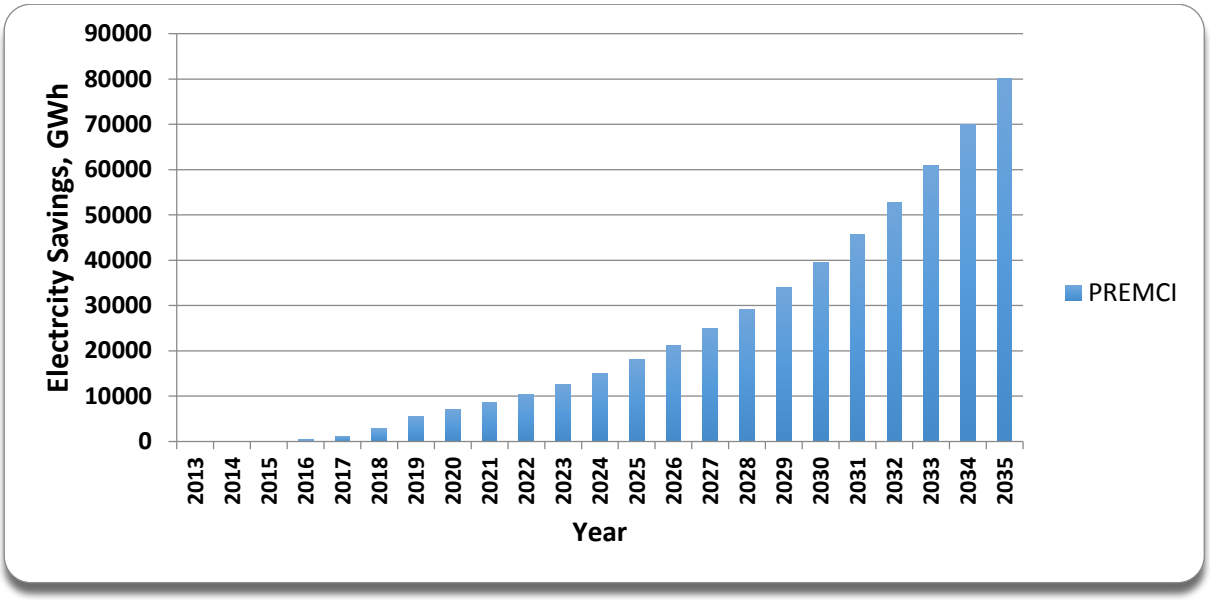

Figure 2: Graphical Summary of Expected Results from the PREMCI Project (In terms of Electricity Savings)

Figure 3 presents the graphical summary of the expected results from the PREMCI Project in terms of annual CO_2 emission reductions as described in **Table 7** above.

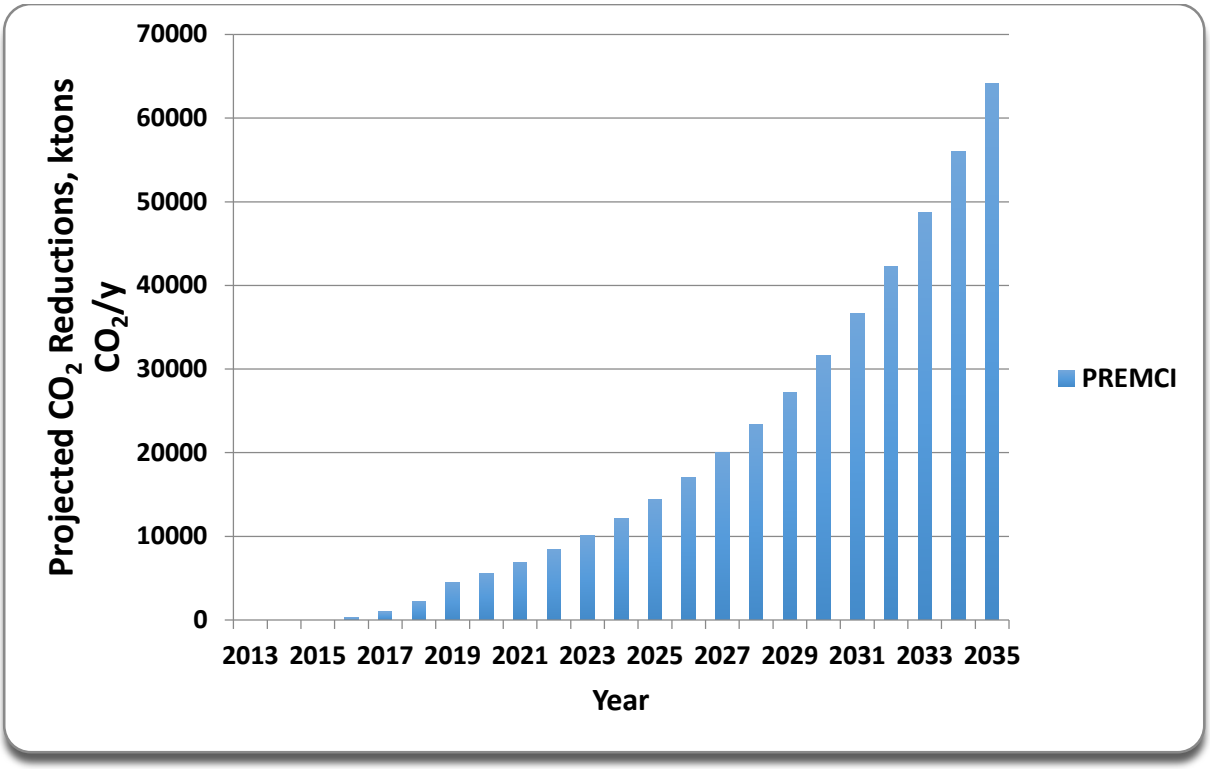

Figure 3: Graphical Summary of Expected Results from the PREMCI Project (In terms of Annual CO_2 Emission Reductions)

Figure 4 presents the graphical summary of the expected results from the PREMCI Project in terms of cumulative CO_2 emission reductions as described in **Table 7** above.

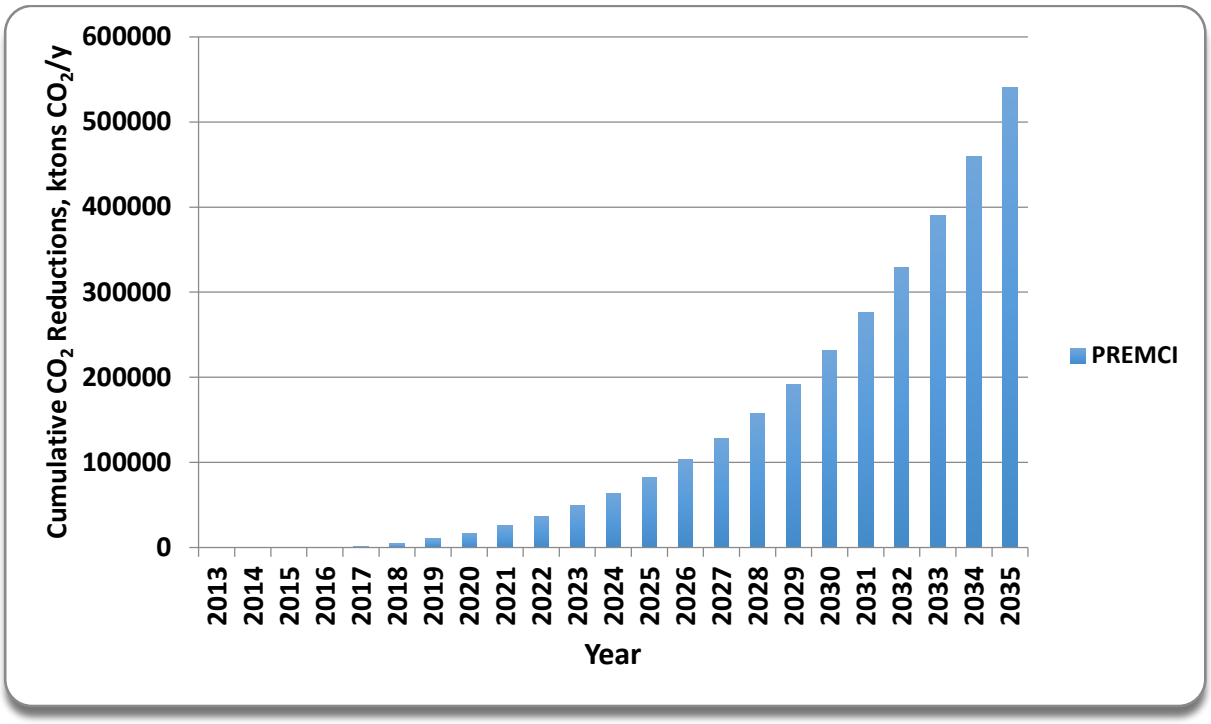

Figure 4: Graphical Summary of Expected Results from the PREMCI Projects (In terms of Cumulative CO_2 Emission Reductions)

COMPONENT 1: POLICY AND REGULATORY FRAMEWORKS ON THE PRODUCTION AND APPLICATION OF EE MOTORS

54. This project component is expected to address the policy, regulatory and institutional barriers in promoting energy efficiency in manufacture, procurement and use of Electric Motors. The Expected Outcome of Component 1 is:

Outcome 1: Enhanced and clearly defined policy enforcement mechanisms on the production EE motors and their applications in the Chinese industrial sector.

55. To achieve Outcome 1, the following Activities will be carried out under Component 1 to deliver each of the Expected Outputs listed below:

Outcome	Output	Activities
1: Enhanced and clearly defined policy enforcement mechanisms on the production of EE motors and their applications in the Chinese industrial sector	1.1: Completed survey of the local electric motor market in China	1.1.1: Conduct of survey of the local electric motor market in China
		1.1.2: Comprehensive investigation and detailed analysis to characterize the local electric motor market as applied to the industrial sector in China
	1.2: Completed review of existing policies and regulations applicable to EE motors applications in industries in China	1.2.1: Evaluation of existing policies and regulations on electric motors and recommendations for EE motors production and applications in industries in China
		1.2.2: Validation of the results of the electric motor policy studies and adoption of an EE Motor Production and Application Strategic Policy and Plan
	1.3: Recommended policies and implementing rules and regulations on EE motors production and their application in the Chinese industries	1.3: Development and facilitation of the adoption and implementation of the recommended system for EE performance standards, testing protocol, and certification system for HEM and REM products
	1.4: Recommended policies and implementing rules and regulations on the development and support of the local EMR industry	1.4: Development and facilitation of the adoption and implementation of policies and implementing rules and regulations on the development and support of the local EMR industry
	1.5: Recommended policies and implementing rules and regulations for the phasing out (including appropriate support measures) of existing low efficiency electric motors	1.5: Development and facilitation of the adoption and implementation of policies and implementing rules and regulations for the phasing out (including appropriate support measures) of existing low efficiency electric motor

Outcome	Output	Activities
	1.6: Established recommended system for EE system performance standards, testing protocol, and certification system	1.6: Establishment and enforcement of implementing rules and mechanisms for the approved policies & regulations including EE performance standards, testing protocol, and certification system on EE Motors production and application
	1.7: Enforced implementing rules and mechanisms for the approved policies & regulations on EE electric motors production and application	1.7: Institutionalization and enforcement of the implementing rules and mechanisms for the approved policies and regulations
	1.8: Established M&E and improvement system on the enforcement of the approved policies and regulations on EE motors production and application	1.8: Establishment of the M&E and improvement system on the enforcement of the approved policies and regulations on EE motors production and application
	1.9: Investment plans for EE motor production by new local electric motor manufacturers who were motivated and influenced by the enforced policies and regulations	1.9: Development and adoption of the investment plans for EE motor production by new local electric motor manufacturers as a result of the enforced policies and regulations

Output 1.1: Completed survey and characterization of the local electric motor market in China

56. *Activity 1.1.1: Conduct of survey of the local electric motor market in China.* This activity is in preparation for a complete investigation of the domestic electric motor market in China at the commencement period of the program. It will involve the design and implementation of the survey instrument including terms of reference (TOR) for conduct of survey, target respondents, questionnaires, sampling procedures in the key industries such as oil and chemical, iron and steel, coal, non-ferrous and power industry, geographical areas where the survey will be conducted.

57. The survey should be designed to derive strategic and wider information regarding the electric motor application in the industrial sector. Moreover, the extent of application of high efficiency motors (HEM) in the industries should already be introduced and related questions asked in the survey (such as factors affecting the decision to purchase HEMs). Target respondents would include electric motor manufacturers, industry associations, industry user groups, research institutes, standardization agencies, relevant government and private agencies and other knowledgeable entities. Considering the size of this market, the design of the survey questionnaire, sampling and data gathering methodology will be reasonable and simple to implement. GEF support is needed for the design, preparation and implementation of the survey. Co-financing support from China will be provided for the coordination meetings and expenses related to local administrative support and logistics, private companies' participation and making available results of other related surveys and industry analyses.

    GEF support is for the technical assistance required in the design and conduct of the Chinese local motor market.

58. *Activity 1.1.2: Comprehensive investigation and detailed analysis to characterize the local electric motor market as applied to the industrial sector in China.* This activity will focus on

the comprehensive investigation and detailed analysis of the local motor market as applied to industries. Among the strategic information necessary for policy formulation activities in Activity 1.2 are the measurement of the status and potential of HEM and REM application, extent of the phase-out program of existing low efficiency motors, availability of service industry for HEMs and relative costs of electric motor applications. The analysis of the results of the survey will be correlated with other pertinent information from other studies and industry analyses in order to come up with a complete characterization of the local Chinese electric motor market with the necessary focus on the three groups of electric motor applications in the industrial sector as mentioned above. Regarding the specific outputs of the analysis, the import and export by types (Y, Y2 and other EE motors), price, share of market, and other relevant data should be included. The different categories of the electric motors in terms of energy efficiency levels and values are seen below:

EE Level	International EE Level	China EE Grade	EE Value
Level 1	IE4	Grade 1 (HEM)	Top Runner Values
Level 2	IE3	Grade 2 (HEM)	Values of Energy Conservation; Targeted MEPs
Level 3	IE2	Grade 3 (YX, GX,)	MEPs
Level 4	IE1	Grade 4 (Y &Y2)	Eliminated Products

59. An expert team will be organized to carry out the survey and analysis on China electric motor industry to know about existing business practices, especially some information on their profitability in the field of EE motor manufacturing and application.

GEF support is for the technical assistance required in the in-depth analysis of the Chinese local motor market.

Output 1.2: Completed policy review on electric motors and adoption of an EE Motor Production and Application Strategic Policy and Plan in Chinese industries

60. *Activity 1.2.1: Evaluation of existing policies and regulations on electric motors and recommendations for EE motors production and applications in industries in China.* This activity will involve work improving and developing policies and regulations for a) EE motor production and application; b) Support for the EMR industry; and, c) Support for the phase out of low efficiency motors in anticipation of Outputs 1.3, 1.4 and 1.5 below. An analysis will be done before hand with the relevant policy making departments and institutes (with necessary consultation with the electric motor manufacturing industry) who are actually involved in terms of what valuable information they need for making policy and regulations and how these information should be made available to them. The results of the needs analysis should guide the review and evaluation methodology and the means of dissemination in Activity 1.2.2. Consequently, the results of the comprehensive review and evaluation will be in the form and context that will be useful for the relevant policy making bodies.

GEF support is for the technical assistance required in the review and evaluation of the existing policies and regulations, and in the technical advice for the formulation of new policies and regulations.

61. *Activity 1.2.2: Validation of the results of the electric motor policy studies and adoption of an EE Motor Production and Application Strategic Policy and Plan.* This activity involves the validation of the survey results, characterization of the electric motor usage and the recommendations on necessary policies and regulations applicable to EE motors

applications in industries in China considering overseas experience, learnings from research investigation, attendance in international workshops and seminars, etc. It aims for the development and adoption of an EE Motor Production and Application Strategic Policy and Plan. In conjunction with Activity 1.1 and 1.2, policy makers will be provided the results of the electric motor survey and the review and evaluation of existing policies and regulations applicable to EE motors applications in industries in China for development of the relevant policies and regulations on EE motors. It will also involve the dissemination and validation of the results of the survey and the policy studies to the relevant policy makers and for them to be aware of the necessary actions and recommendations.

62. Upon completion and submission of the results to MIIT and relevant agencies, a Seminar/Workshop will be conducted by the project where the results of the survey, characterization of electric motor usage and policy studies will be introduced by the designated consultants and be validated by the relevant policy making bodies (with necessary consultation with the electric motor manufacturing industry and user groups) as they are applicable to their functions.

63. In the process, the necessary actions and recommendations will be understood very well and agreed upon by the stakeholders in the: 1) EE motor production and application, 2) EMR industry; and, 3) Phase-out program of existing low efficiency electric motors. As a result, the conclusions should guide the appropriate policy making program and implementation that the project will facilitate for the development and adoption of the EE Motors Production and Application Strategic Policy and Plan with the success indicators, targets, monitoring and evaluation system, risk analysis and the requisite management and organizational approach towards achieving and sustaining the desired results within the timeframe of the project and beyond.

64. Supplemental multimedia campaigns, website announcements, articles and news releases, mails, press conference and follow-up meetings and workshops will be carried out for an effective dissemination and raising awareness of the results of the review and strategic plan formulation and adoption.

    GEF support will be for the required technical assistance in the conduct of the consultations and stakeholder meetings, dissemination of the results of the survey and policy studies and preparation of the EE Motor Production and Application Strategic Plan.

Output 1.3: Recommended policies and implementing rules and regulations on EE motors production and their application in the Chinese industries are adopted and implemented by responsible government agencies

65. *Activity 1.3: Adoption and establishment of the recommended system for EE performance standards, testing protocol, and certification system for HEM and REM products.* The activities will include review and adoption of the results and recommendation of the comprehensive policy study and develop the proposal of feasible EE motors production and application policies through the government procedures including policy hearings and deliberations. The EE Motor Production and Application Strategic Plan and the monitoring scheme for the process for this activity which should be integrated with Activity 1.4 and 1.5 will be an important part of this activity to ensure that desired overall results will be achieved within the agreed timeframe. This activity will also be linked with recommended outputs of Sub-Activity 2.2.4.1 and 2.2.4.2 on the development of the energy efficiency certification standards for integrated HEM application system.

    GEF support is required to facilitate and complete the inputs to the comprehensive study and policy impact bases and preparation of the policy monographs and proposals to relevant policy making bodies on EE motor policies and implementing rules.

Output 1.4: Recommended policies and implementing rules and regulations on the development and support of the local EMR industry are adopted and implemented by responsible government agency

66. *Activity 1.4: Development, adoption and implementation of policies and implementing rules and regulations on the development and support of the local EMR industry*. This activity will involve the development of the relevant incentive policies for EMR industry to produce REMs. It will include developing the proposal of REMs policies and proposing to MIIT or relevant policy making agencies. Specialized technical meetings and workshops are needed to draw commitment from various stakeholders and substantiate the development and facilitation of the policy adoption process and integration of the results of this activity with those of Activity 1.3 and 1.5.

    GEF support is required for the facilitation and completion of the inputs to the comprehensive study and policy impact bases and preparation of the EMR policy monographs and proposals to relevant policy making bodies.

Output 1.5: Phase-out plan (including appropriate support measures) on existing low efficiency electric motors implemented by responsible government agencies

67. *Activity 1.5: Development and implementation of policies and implementing rules and regulations for the phasing out (including appropriate support measures) of existing low efficiency electric motor*. This activity will help the government to make the roadmap for the program on the phasing out program. It will also include developing the necessary policies and regulations to phase out of low efficiency electric motors. Specialized technical meetings and workshops will be conducted to draw commitment from various stakeholders and substantiate the development and facilitation of the policy adoption process for the phase-out program and integration of the results of this activity with those of Activity 1.3 and 1.4.

    GEF support is required for the facilitation and completion of the inputs to the comprehensive study and policy impact bases and preparation of the phase-out policy monographs and proposals to relevant policy making bodies.

Output 1.6: Established and enforced implementing rules and mechanisms on EE motors production and application

68. *Activity 1.6: Establishment and enforcement of implementing rules and mechanisms for the approved policies, implementing rules and regulations and programs on EE Motors production and application.* This activity will focus on the institutionalization of the EE Motor Production and Application Strategic Policy and Plan adopted in Activity 1.2. The development and enforcement of appropriate government mandates on policies, implementing rules and regulations (IRRs) on EE motors production will be facilitated. This include EE motor application, electric motor remanufacturing; phase-out plan on low efficiency motors; and the requisite EE performance standards, testing protocol, and certification system for HEM and REM products. The applicable EE performance standards for HEMs and REMs that were discussed and agreed upon in **Activity 2.1.1.1** for the integrated electric motor application system standards and **Activity 2.2.3.1** for electric motor recycling standards and electric motor remanufacturing standards shall deliberated on and final version adopted and promulgated following government approval procedures within the timeframe of the project. This activity shall also be linked with recommended outputs of Activity 2.2.4.1 on the development of the HEM certification system. A major part of this activity is the establishment of an EE performance and certification system for HEMs and REMs. The system shall be approved and adopted by

authorized testing and certification institutions covering electric motor systems. The final version shall be approved by national departments in charge of standardization. It is expected that the system can be mandatory national standards for the scale-up program.

GEF support is for the technical assistance required in the implementation of the EE Motor Production and Application Strategic Policy and Plan, and in the development of the EE performance and certification system for locally manufactured HEM and REMs.

Output 1.7: Enforced implementing rules and mechanisms for the approved policies & regulations on EE electric motors production and application

69. *Activity 1.7: Institutionalization and enforcement of the implementing rules and mechanisms for the approved policies and regulations.* This activity will involve the adoption and implementation of the implementing rules and mechanisms for the approved policies and regulations in the relevant government agency under the supervision of the MIIT. The project will provide technical assistance for the necessary guidance and inputs to augment the baseline activities by the government that will ensure that these rules and mechanisms established in accordance with the relevant government procedures, institutional/budgetary requirements and authorities.

    GEF support is for the technical assistance needed in the development of necessary implementing rules and regulations for EE electric motor production and application in the Chinese industries.

Output 1.8: Established M&E and improvement system on the enforcement of the approved policies and regulations on EE motors production and application.

70. *Activity 1.8: Establishment of the M&E and improvement system on the enforcement of the approved policies and regulations on EE motors production and application.* This activity will involve the design, establishment and maintenance of a monitoring and evaluation (M&E) system that will cover all related activities and outputs of the EE motor production and application program and its sustainability. Once approved, the implementation of the M&E system should be administered by an appropriate agency under the MIIT with the necessary policy guideline, organization and budgetary support. Relevant players in the electric motor industry will be required to submit periodic reports (e.g. quarterly) in line with the activities and output indicators that will be initiated during the project. This activity will be linked with Activity 4.1 on electric motor market monitoring system to be developed and implemented by the project. The relevant staff members of the MIIT agency and key representatives of the electric motor industry will be trained for effective implementation of the M&E system, including systematic calculation or estimation methodologies, means for improving energy utilization efficiency in electric motors, and the required reporting procedures.

    GEF support is for the technical assistance for the development and establishment of the M&E system.

Output 1.9: Investment plans for EE motor production by new local electric motor manufacturers who were motivated and influenced by the enforced policies and regulations.

71. *Activity 1.9: Development and adoption of the investment plans for EE motor production by new local electric motor manufacturers as a result of the enforced policies and regulations.* This activity will focus on the design, establishment and maintenance of a monitoring and evaluation (M&E) system that will cover all related activities and outputs of the EE motor production and application program and its sustainability. Once approved,

the implementation of the M&E system should be administered by an appropriate agency under the MIIT with the necessary policy guideline, organization and budgetary support.

GEF support is for the technical assistance in the development of investment plans and technical/financial guidance for local manufacturing of EE motors (HEM/REM).

COMPONENT 2: ENERGY EFFICIENT ELECTRIC MOTOR PRODUCTION AND APPLICATIONS

72. Component 2 is comprised of activities that will address the barriers related to the lack of capacity to locally produce EE motors. There are very few EE motor (HEM and REM) manufacturers in China. The existing ones often have limited technical capacity in designing and producing products that are at par with international standards (e.g., IEC, NEMA) in terms of quality and energy utilization performance. The Expected Outcome of Component 2 is: **Increased local production of EE motors for applications in Chinese industries**

73. To realize Outcome 2, the following are the Activities that will be carried out under Component 2 to come up with each Expected Output listed below:

Outcome	Output	Activities
2: Increased local production of EE motors for applications in Chinese industries	*2.1: Successfully completed/ implemented technical assistance provided on local production of EE motors*	
	2.1.1 Adopted capacity development program for local EE motor (HEM and REM) manufacturers	2.1.1.1: Development of energy efficiency design standard for the integrated electric motor application system
		2.1.1.2: Development of specialized HEM design software and model
	2.1.2: Completed training courses for local electric motor manufacturers on the design and manufacturing of EE motors (HEMs and REMs)	2.1.2.1: Conduct of training courses for HEM design and manufacturing staff.
		2.1.2.2: Conduct of training courses for staff in HEM service industry
		2.1.2.3: Conduct of training courses for REM technical staff
	2.1.3 Disseminated information on improved EE motor product design and production	2.1.3.1: Holding of national HEM and REM achievement exhibitions
		2.1.3.2: Conduct of regional HEM proliferation (scale-up) workshops
	2.2: Institutional development in increasing production of EE Motors	
	2.2.1: Established and operational EE motor research center and EE motor industry association	2.2.1.1: Establishment of the National EE Motor Research Center
		2.2.1.2: Establishment of the China EE Motor Industry Association
	2.2.2 Completed demonstration of improved EE motor product design and manufacturing	2.2.2: Demonstration of improved EE motor product design and manufacturing
	2.2.3 Commercialized REM	2.2.3: Development and commercialization of REM products

Outcome	Output	Activities
	2.2.4: Established and enforced EE motors application system testing and certification system	2.2.4.1: Development of energy efficiency certification standards for integrated HEM application system
		2.2.4.2: Development of documents to promote HEM certification system

Output 2.1: Successfully completed/ implemented technical assistance provided on local production of EE motors

This major output is comprised on 2 sub-outputs, which are described below, including the activities that will be carried out to deliver each of them.

Output 2.1.1 Developed capacity development program for local EE motor (HEM and REM) manufacturers

74. *Activity 2.1.1.1: Development of energy efficiency design standard for the integrated electric motor application system.* This activity will involve the system development road map starting with one or two electric motor systems which are massively applied and highly representative in the industry. It mainly involves doing a comprehensive research for the main electric motor application system within the entire industrial complexes in the country. This will mainly include the electric motor application in plant systems that involve pumps, draught fans, compressors, material handling equipment and other similar engineering equipment. The studies will involve analysis of the actual operating and loading conditions of these sets of equipment when they are combined with the HEMs to ascertain the factors that lead to enhanced overall performance and energy efficiency and their contribution effects. The analysis will support a basic indexing system that will guide the energy efficiency design for an electric motor application system with the margin settings and operational parameter ranges of each section. In doing so, the desired energy efficiency design standard for electric motor application system can be developed and established.

75. A consensus among industry players on what EE standards to be applied for HEMs will be made through a Task Force to be organized and will be composed of designated representatives from the China EE Motor Industry Association organized in **Activity 2.2.1.2**, the user groups, the government standards development and testing institutes and the government certification bodies. The Task force will work to resolve related issues in connection with in putting up standards as harmonized with other existing standards and implementing guidelines for HEMs and to recommend adoption of the standards by appropriate government standards development, testing and certification agencies.

76. The standard in this Activity 2.1.1.1 is developed for energy efficiency design and energy efficiency assessment of integrated electric motor application system and is to be adopted by design organizations and project consulting organizations. The standards in Activity 2.2.4.1 is developed for third-party organizations to check if the integrated electric motor application systems can satisfy the requirements in the standards and if the systems can pass energy efficiency certification and be used and adopted by the market. Standards used in other countries will also be studied for possible application (perhaps in a modified form) in the standards that will be developed[10].

[10] An example of a global efficiency standards for 3-phase AC motors are specifications from IEC 60034-30. Be2.sew-eurodrive.com). It defines energy efficiency classes for single-speed, 3-phase, and 50 Hz and 60 Hz induction motors and is designed to unify motor testing standards, efficiency requirements, and product labelling requirements for easy recognition of premium EE electric motor products.

77. A series of trials and modifications will be made after the completion of first draft of the standard in consultation with electric motor manufacturers and equipment designers for continuous improvement until it is finally approved by proper authorities and ultimately used by the industry. For maximum benefits, it will be proposed as a national mandatory standard which can later on be disseminated and implemented to improve the energy efficiency levels of electric motor application systems.

78. The activity will involve MIIT and General Administration of Quality Supervision, Inspection and Quarantine (GAQSIQ). A technical working group for the electric motor application system research composed of equipment designers, manufacturers and users will be organized to work on the activity. The advanced technology and management experiences in other countries will be referred to in developing the standard which can meet the China's development direction and objectives of energy efficiency enhancement program for electric motor application systems. In the process of standard development, special attention will be given to the opinions and suggestions from users of electric motor system to guarantee that the standard can reflect the requirements of the promotion of energy efficiency level of electric motor to the greatest extent. In the process of trial, dissemination and implementation of standard, the function of design and engineering consultation units should come into play to resolve problems encountered under the supervision and guidance of the energy conservation department.

    GEF support is for the technical assistance required for accessing advanced technology and management experience in other countries and the provision of qualified international experts.

79. *Activity 2.1.1.2: Developed specialized HEM design software and model.* This activity involves developing specialized HEM design software and model, which is realistic and simple, suitable for the country's electric motor market, acceptable by the domestic electric motor designers and manufacturers, and ready for dissemination and application. In the process of software development, a wide range of researches will be done, and the requirements of the software will be confirmed according to the electric motor design and manufacturing situation and the requirement condition of a specialized HEM.

    GEF support for the technical assistance required for accessing advanced technology and management experience from other countries with advanced software and model applications and services from qualified international experts.

    <u>Output 2.1.2: Completed training courses for local electric motor manufacturers on the design and manufacturing of EE motors (HEMs and REMs)</u>

80. *Activity 2.1.2.1: Conduct of training courses for HEM design and manufacturing staff.* The activity is intended for enhancing the technical and management ability of professional technical staff engaged in HEM production through development of pertinent training manuals and selection and capacity development of the relevant trainers to become qualified teachers to train the professional technical staff engaged in HEM production. In the process of implementation of the activity, close attention will be given to curriculum design, manual compilation, course material preparation and teacher optimization to ensure that they conform to the industrial reality in the country. Experiences and lessons learned on improving the quality and energy performance of HEMs and REMs (also in Activity 2.1.2.2 & 2.1.2.3) that are designed and manufactured in other countries (e.g. USA, Canada, etc.) will be integrated in the preparation of the training materials. The trainees will be carefully selected to ensure that they represent the HEM design and manufacturing staff, have lead role in their companies, will apply knowledge gained, can impart the knowledge to the fellow staff around them, and can contribute in enhancing the overall performance quality of the other similar employees to maximize the training results.

GEF support is for the technical assistance required for the development of training materials and for the conduct the specific training courses and monitor and evaluate the training program implementation and the results to ensure the training beneficial impacts.

81. *Activity 2.1.2.2: Conduct of training courses for staff in HEM manufacturing industry.* This activity focuses at enhancing the technical and management ability conditions of professional technical staff engaged in HEM production; in preparing practical and realistic training manuals, textbook and courseware; and in selecting and developing capacity of the professional trainers to train the HEM service staff.

    GEF support is for the technical assistance in the conduct of the HEM training courses and logistics for the conduct of the training and for the monitoring and evaluation of the training program impacts.

82. *Activity 2.1.2.3: Conduct of training courses for REM technical staff.* This activity is intended for enhancing the technical and management ability of professional technical staff engaged in HEM production through development of pertinent training manuals and selection and capacity development of the relevant trainers to train the professional technical staff engaged in HEM production focusing on remanufacturing of electric motors to improve energy efficiency. A training needs analysis will be conducted. From the results of the study, curriculum design, training manual compilation, and courseware preparation and training the trainers will be conducted to ensure that they conform to the industrial reality in the country. The trainees will be carefully selected to ensure that they represent the REM design and manufacturing staff, have lead role in their companies, will apply knowledge gained, can impart the knowledge to the fellow staff around them, and can contribute in enhancing the overall performance quality of the other similar employees to maximize the training results.

    GEF support is for the technical assistance in the conduct of the HEM training courses and logistics for the conduct of the training and for the monitoring and evaluation of the training program impacts.

    <u>Output 2.1.3 Disseminated information on improved EE motor product design and production</u>

83. *Activity 2.1.3.1: Holding of national HEM and REM achievement exhibitions.* At present, the HEM share in domestic market is only about 5%. This activity will showcase the technical achievements of HEM and REM industry in China; demonstrate the contribution of the widespread applications of HEMs and REMs in achieving energy conservation and GHG emission reduction; improve the users' preference in selecting, purchasing, and using the HEM and REM with clearer perception of the benefits derived from them; and more importantly, expand the HEM and REM market.

84. The planned exhibitions will be coordinated with the existing energy conservation dissemination programs in China for greater media and public interest mileage. The exhibition will be coupled with a convention to capture the mass of information and recommendations in building the market for HEMs and REMs. This will be held during the annual energy conservation publicity week, either solely or together with an existing energy conservation publicity exhibition in China. This will be held during the annual national energy conservation publicity week, either solely or together with an existing energy conservation publicity exhibition in China. The activity is designed to involve strong support and participation of responsible departments or agencies in national industrial energy conservation in cooperation with private companies and enterprises. For sustainable outcomes, the feasibility of holding the exhibitions and conventions annually

and the establishment of some energy conservation exhibition buildings in key cities to support a long-term HEM and REM exhibition and promotion program in line with wider social publicity, awareness and education objectives on electric motor energy conservation will be comprehensively conducted as part of this activity.

GEF support is for the technical and logistical assistance in the planning, organization and holding of the exhibitions and conventions planned for the duration of the project.

85. *Activity 2.1.3.2: Conduct of regional HEM proliferation (scale-up) workshops.* This activity will involve the dissemination of information about the achievement of the program through yearly forum sponsored by MIIT focusing on specific themes that will highlight significant program milestones. The workshops will provide an effective venue for discussing the progress HEM technology development and commercialization and resolving the prevailing system and mechanism technical problems in the process of HEM technology proliferation and market development.

86. The MIIT's Industry and Information Technology Departments (IITDs), especially the local host IITD of the selected workshop/meeting venues will be strongly supporting this endeavor. The participants are personnel from the IITDs, HEM manufacturers, marketing groups, technical service providers and electric motor user groups, including those from the finance and banking departments. During the workshops, the participants will also visit the manufacturing sites of HEM in the area to further disseminate the HEM manufacturing technology.

GEF support is for the technical and logistical assistance in the planning, organization and conduct of the workshop/meetings and publishing information packages to disseminate the progress of the achievements of the project.

Output 2.2: Developed and established institutional support in increasing production of EE Motors

Output 2.2.1: Established and operational EE motor research center and EE motor industry association

87. *Activity 2.2.1.1: Establishment of the National EE Motor Research Center.* This will involve all the necessary actions to comply with all requirements (administrative, logistical, etc.) for the establishment of a National EE Motor Research Center that is expected to carry out regular programs that will address issues such as scattered R&D capacity and poor information sharing. This center will be supported by the IITDs, Science and Technology departments, domestic universities, scientific research institutions and key EE motor manufacturers.

GEF support is for the technical and logistical assistance in the development and establishment and long-term operation of the center with start-up funding.

88. *Activity 2.2.1.2: Establishment of the China EE Motor Industry Association.* This activity will involve actions to set up an industry association[11] that will provide sound industrial management and self-regulation environment for the EE motor industry. It involves the participation of the MIIT, Civil Affairs departments and Quality inspection departments in

[11] The association is an organization initiated voluntarily by the industry players, will operated independently through its own resources and will be responsible for the management and self-regulation of the industry. It shall lead the development of China EE motor industry by formulating and administering its own standard that could at least comply with or be stricter than the promulgated national standards to continuously improve the energy efficiency levels of EE motors produced by its members.

collaboration with existing organizations. The major output of this activity is the established and operational industry association that is approved and supervised by the government under regulations applicable to such organizations. A feasibility study and strategic planning will be prepared to come up with the most suitable organizational structure, and arrangements for membership, funding support, operational procedures, administrative support, activity plan, service offerings, external network linkages and sustainability plan for the association. As the association builds its capability as well as gain public and industry support, it can look forward formulating its own standards and logo, to implement the standards under a self-regulation arrangement, and to be the key prime mover in promoting energy efficiency of electric motors. The association will be actively involved also in the EE Motor Information Network that will be established in Component 4 during the project implementation and sustained by the stakeholders for long-term operation as one of the substantial achievement of PREMCI.

GEF support is for the technical and logistical assistance for the incremental needs in the establishment of China EE Motor Industry Association, e.g., for the planned activities to conduct the preparation of the feasibility study, develop a strategic plan, to put in place sound internal organization and external mechanisms that link the association with related networks and to support the association's initial operation.

Output 2.2.2 Completed demonstration of improved EE motor product design and manufacturing

89. *Activity 2.2.2: Demonstration of improved EE motor product design and manufacturing.* This activity will involve selection of at least three (3) sound and progressive enterprises that will pilot and promote production in the best possible means. The enterprises will introduce and host the demonstration of the application of the latest HEM research results in the 3 selected HEM prototype designs in collaboration with the research institutes and/or own R&D group of the enterprise. They will devise innovative techniques to produce HEMs with the objective of achieving energy efficiency enhancement in the performance of the electric motors manufactured following the prescribed HEM designs.

90. The successful implementation of the demonstration projects of HEM production is very essential to the achievement of the PREMCI objective. Details of the demonstration activities are presented in Annex VI.

91. Aside from the completed demonstrations, the commercialization plan for the successful HEM designs and prototypes that can be developed by the enterprises themselves will be one tangible output of this sub-activity. The plan will present the investments in the modification of their production lines to accommodate the shift to HEM production. The timing of possible introduction of actual HEM production within the timeframe of the PREMCI project will be guided by the monitoring and evaluation scheme that will be adopted by the project.

GEF support is for the technical assistance in the design of the HEM/REM design and manufacturing demos, and funding for the incremental features of identified baseline demos.

Output 2.2.3 Commercialized REM products

92. In addition to the technical assistance provision under Output 2.2, this activity involves encouraging investments in electric motor remanufacturing (EMR). With the expanding EE motors entry into the market, more and more low-efficiency motors need to be phased out. It is important to scientifically, reasonably deal with these low-efficiency motors. EMR is a sound way to produce high-efficiency remanufactured electric motors (REMs) with low-

efficiency electric motors. It adopts a nondestructive, environment-friendly way to disassemble the phased-out motors, maximize the recycling of some parts. EMR is an effective way to realize resource conservation and comprehensive utilization. For instance, the replacement of low-efficiency electric motors of 10 million kW with REMs can realize annual electricity conservation of 3.7 billion kWh.

93. *Activity 2.2.3.1: Development of electric motor recycling standards and electric motor remanufacturing standards.* This activity will make reference to the existing GB18613-2012 standard and affirm the concept on HEM (IE3 for HEM and IE2 or other national compulsory standards for REM). This activity will involve firstly the preparation of a feasibility study to comprehensively assess the present situation, measure the potential of EMR, determine the scope and requirements of an EMR program that will be supported by the PREMCI project and recommend an action plan and road map for the adoption and implementation of an EMR program by the Chinese Government. This includes intensive technical investigation, EE standards drafting and demonstration, and EE standards approval, implementing guidelines issuance and ultimately a program launching for the REM proliferation or scaling-up. The EE standards for REMs shall take into account existing standards and standards approval process for related similar products in China. The Industry and Information Technology departments and Quality Supervision departments will support the formulation of REM standards considering local situation and advanced international remanufacturing technologies and management experience to improve EMR in China. Electric motor manufacturers are willing to participate in this activity.

    GEF support is for the technical assistance in the conduct of feasibility study, road map and action plan preparation and in the development of electric motor remanufacturing standard system in China.

94. *Activity 2.2.3.2: Demonstration project of electric motor remanufacturing.* This activity will involve selection of at least three (3) sound and progressive enterprises that will pilot and promote production of REMs in most effective way possible focusing on breakthroughs in EMR technologies. The selected enterprises will introduce and host the demonstration of the application of the latest HEM research results in the 3 selected different REM prototype designs in collaboration with the research institutes and/or own R&D group of the enterprise. The enterprises will devise innovative techniques to produce HEMs with the objective of achieving energy efficiency enhancement in the performance of the REMs following the prescribed REM designs. Similar to HEMs, this activity will be part of the demonstrations to showcase cost effectiveness of REM products based on a series of energy efficiency testing following the standard testing protocols developed in **Activity 2.2.3.1**.

95. The initial 3 electric motor manufacturers are to be selected and developed as pilot REM enterprises based on qualification criteria that include for instance the willingness of the enterprises, experience in R&D and commercialization, technological level of their staff, types of electric motors produced in relation to the REM prototypes selected. The outputs of this activity shall be monitored and evaluated. The results and experiences in the pilot demonstrations will be documented and shared in the project activities under Activity 2.1.3 involving dissemination information on improved REM product design and production to promote and encourage enterprises to go into of REM production and also increase REMs in the market.

96. The IITDs and Department of Finance are essential partners for this activity. A study of the feasibility of subsidizing REM production will be carried out as part of this activity, and an appropriate recommendation on the mechanics and implementation of the subsidy

scheme (including timetable) will be developed, with the view that the subsidy will be reduced step-wise until it is finally removed during an appropriate time.

GEF support is for the technical assistance in the design of the REM manufacturing and for funding incremental features in the baseline REM manufacturing initiatives of selected EM manufacturers hosting the REM manufacturing demos.

Output 2.2.4: Established and enforced EE motors application system testing and certification system

97. *Activity 2.2.4.1: Development and implementation of energy efficiency certification standards for integrated HEM application system.* This will involve the formulation of a road map for electric motor systems that are typically and largely used in the industries to guide the standard development and certification process[12]. An energy conservation indicator system and testing measures for integrated HEM application systems will be formulated. The indicator system shall be concise and simple and the testing protocols shall be easy to apply. The results from pilot demonstration of the drafted system shall be used in finalizing the system documentation. The system shall be approved and adopted by electric motor system testing and certification institutions. The final version shall be approved by national departments in charge of standardization. It is expected that the system can be mandatory national standards for the proliferation stage or scale-up. Third-party organizations such as CQC or Jianheng with approval of CNCA can be introduced to administer the certification process towards improving energy efficiency of electric motor systems. A study on the appropriate organization shall be conducted by the project to provide recommendations on the matter.

98. The formulation of documents and implementing guidelines to promote HEM certification system to enhance the development of HEM industry by adopting third-party certification is part to this activity on the establishment of the HEM certification system. A coordination mechanism and dissemination/promotion plan will also be formulated. The implementation of certification system for different types of HEMs will be guided and facilitated under this activity. Moreover, specified policy measures to support HEM certification and to enhance capacity building of testing and certification will be formulated to scale up HEMs in coordination with **Activity 1.6**. The outputs of this activity shall be approved and adopted by MIIT and GAQSIQ of PRC to become an important EE policy. Thus, aside from the support of MIIT and GAQSIQ, this activity needs support of electric motor research institutions, testing organizations, manufacturers and user groups as well.

GEF support is for the technical assistance required in the development and implementation of energy efficiency certification standards for integrated HEM application systems.

99. *Activity 2.2.4.2: Development of energy-conservation assessing software for the integrated HEM systems.* This activity will involve developing energy-efficiency assessing/diagnostic software[13] for integrated HEM systems, which will describe the

[12] There are existing certification systems for electric motors, pumps, fans and other products in China. HEM certification system needs to be established. National standards have been issued including three-phase asynchronous motors energy-saving operation standard and economic operation for the fan system. However, standards for HEM energy conservation testing and certification need to be updated and harmonized with existing standards. Along with the increasing demand for HEMs and the improvement of HEM design, production and application, it is essential to formulate HEM certification system.

[13] Currently, there are few energy efficiency diagnostic measures for the application in electric motors, especially for HEMs. It is common practice in China that for high energy-intensity equipment requirement, high-capacity electric motors are preferred due to lack of confidence about the available electric motors and therefore, overestimate the production capacity of the equipment and energy usage. Recently, energy consumption diagnosis

characteristics of the system, as well simulate various functions including energy flow, outputs, investment, operation and maintenance. The software will assist in trying various options, deciding on the final configuration of the equipment design and optimization of the application and operation of the HEM system. With such measures and tools for diagnosis, the understanding and confidence of electric motor manufacturers and industrial enterprises will be significantly improved and therefore, this will promote the increased application of HEMs in any potential systems. In the process of software development, wide range research will be conducted to address technical, financial, market and economic issues. Domestic equipment designers and manufacturers, academic and scientific research institutions, and user groups will participate. The leading agency for this activity should have extensive experience in related software development, modelling and application.

GEF support is for the technical assistance required in developing and applying the energy-efficiency assessing/diagnostic software for integrated HEM systems.

COMPONENT 3: FINANCIAL SUPPORT & ACCESSIBILITY IMPROVEMENT

100. Component 3 will address the removal of specific financial barriers related to shortage of financing for EE motors (HEMs and REMs) production and application and will be coordinated very closely with the general policy and program directions developed and promulgated in Component 1. Directionally, Component 3 will involve determining what kind of specific financial support and access mechanisms will be needed to make the EE motor production and application feasible. The possibilities will be drawn from a comprehensive feasibility study and action planning that will be done at the beginning of this Component. This component will also make sure that sufficient consultation is made with the key stakeholders of the EE motor industry. Once the results and recommendations are validated, the appropriate agencies will develop and adopt the detailed plans, financial models and incentive schemes to provide ample support and easy access to these initiatives. The Expected Outcome from Component 3 is i**ncreased application of domestically produced EE Motors (HEMs and REMs) in Chinese industries.**

101. To realize Outcome 3, following are the Activities that will be carried out under Component 3 to come up with each Expected Output listed below:

Outcome	Output	Activities
3: Increased application of domestically produced EE Motors (HEMs and REMs) in Chinese industries	3.1: Completed techno-economic feasibility assessment and recommended action plan for financing improved EE motor initiatives of local electric motor manufacturers and suppliers	3.1: Techno-economic feasibility assessment for the production and application of EE motors
	3.2 Developed and implemented action plan for financing improved EE motor initiatives of local electric motor manufacturers and suppliers	3.2: Development, adoption and implementation of a detailed plan for the financing initiatives and incentive schemes for EE motor production and application
	3.3: Developed and implemented suitable business models for local financial institutions to support EE motor production and application	3.3: Development and implementation of suitable business models to support EE motor production and application.

or assessment has been introduced as a new concept in China. It is difficult for industrial enterprises to design professional software for designing and producing equipment/facilities with emphasis on selecting the most appropriate capacities of electric motors. Specialized energy-conservation assessing/diagnostic software for the integrated HEM system should be developed under this project.

Outcome	Output	Activities
	3.4: Operational appropriate EE motor incentive mechanism	3.4: Design and operationalization of an EE motor incentive mechanism such as a rebate program for electric motor users

Output 3.1: Completed techno-economic feasibility assessment for the production and application of EE motors

102. *Activity 3.1: Techno-economic feasibility assessment for the production and application of EE motors.* This activity will focus on attracting financial institutions, potential investors and related government agencies to make decisions to provide financial support to the local production and application of EE motors by providing them more information about EE motor industry especially the analysis on cost/benefit analysis, market potentials and techno-economic feasibility of EE motor production and application. At the same time, the results of the techno-economic feasibility study for EE motor production and application can be used by government authorities as valuable references when they draft policies/regulations related to the EE motor industry which will be closely linked with Component 1 activities.

103. An EE Motor Expert Team composed of representatives of the key stakeholders of the project who are skilled in technology, market and finance will be organized to evaluate different electric motor technologies available in China and other parts of the world, to compare among the possible technology alternatives as well as relevant risk analysis, , to recommend financial models and incentive schemes considering the prevailing policy, regulatory and market conditions, to determine the training, information inputs and resource requirements, and to recommend an action plan to carry out the financing program for EE motor production and application in Chinese industries. Several scenarios consisting of conversion of existing electric motor production lines to EE motor production lines, establishment of a new EE motor production line, replacement of low efficiency motors with EE motors (or retrofit of low efficiency motor system) and other EE motor application schemes will be taken into consideration in the conduct of the study and preparation of the report. In terms of presentation of results, the report will consist of two major parts viz.: 1) Production of EE motors; and, 2) Application of EE motors, in terms of assessment, findings, recommendations and action plan. Because of the different nature of elements involved, the report should also distinguish between the two types of EE motors: 1.) HEMs and 2.) REMs.

104. The results of the abovementioned assessments and determination of the feasible EE motor technologies and their applications will be integrated by the EE Motor Expert Team in the Techno-Economic Feasibility Study Report which will cover the technical, economic, financial, market and resource aspects as well as the recommended financing models and incentive mechanisms. Based on the results of the study, the EE Motor Expert Team shall recommend an action plan to encourage promotion and financing of EE motor production and application in Chinese industries.

105. To effectively introduce and validate the findings and recommendations embodied in the draft Techno-Economic Feasibility Study Report, the report will be disseminated to the China EE Motor Industry Association members, the electric motor industry user groups and the general public through the information network established under the Component 4 of the proposed GEF project. Energy efficiency may be a low priority issue for end users. It is necessary to demonstrate the high benefits of investment in energy efficiency motors in selected feasible applications. A Seminar/Workshop will be conducted to gather knowledgeable groups to present and discuss the findings and recommendations and

validate them. The final Techno-Economic Feasibility Study Report will be prepared based on the feedback gathered in the Seminar/Workshop and will be submitted to appropriate government agencies and institutes and detailed planning and implementation as described in Activity 3.2. The studies will therefore follow a focused approach for energy efficiency motors applications and piloting rather than national efforts covering all industries at national level.

GEF support is for the technical assistance in the conduct and completion of surveys, feasibility studies, Seminar/Workshop and the planned activities of the EE Motor Expert Team.

Output 3.2: Developed and implemented an action plan for financing improved EE motor initiatives of local electric motor manufacturers and suppliers

106. *Activity 3.2: Development, adoption and implementation of a detailed plan for financing initiatives and incentive schemes for EE motor production and application.* This activity will be a follow-up of the Techno-economic Feasibility Study Report and the Action Plan approved in Activity 3.1.1, and will be in close coordination with the banking and financial institutions. This activity will work on creating a fairer market atmosphere is expected to be further cultivated to help EE motors gain competitive advantages. It will involve actions to mobilize specific financial resources and loan windows with banking and financial institutions for financing EE motor initiatives of more electric motor manufacturers/suppliers in the production of EE motors through encouraging adoption of advanced techniques, which will not only enhance the implement performance of existing policies and regulations related to EE motor industry, but also contribute to the establishment of a fairer market environment for promoting EE motor products.

107. Under this activity, a practicable program and timetable to provide financial support and/or improve financial accessibility for EE motor initiatives of local electric motor manufacturers/suppliers who commit themselves to the phase-out of low efficiency electric motors and the promotion of EE motors will be developed. Electric motor manufacturers and suppliers participating in the EE Motors Financing and Incentives Program will phase out low efficiency electric motors, develop higher standard of EE motors as well as promote EE motor products of their own initiatives. Incentive measures that will be considered will include, but not limited to, a) giving priority of subsidy from existing policies; b) granting priority of green-credit loan; c) offering technical support by convening electric motor industry experts; and d) promoting manufacturers to enhance their visibility by the dissemination network established in the Component 4 of the proposed GEF project. In addition, an EE Motor Grants fund, to be justified by a feasibility study to be conducted, is expected to be launched under this activity, to provide more financial support and access for EE motors initiatives and enlarge the scope of the EE Motors Financing and Incentives Program.

108. Financial experts will be invited to conduct research to review existing financial mechanisms vis-à-vis the current national policy and regulation framework and practices related to EE motor industry, and identify and evaluate the major factors or barriers that affect the implementation of financial policies and regulations. This research can be jointly implemented with related activity under the Component 1 of the proposed GEF project. The findings and recommendations will be presented and validated in a Seminar/Workshop to be participated in by members of the EE Motor Industry Association, manufacturers/suppliers, local government and user groups. The validated results and recommendations will form the basis for the EE Motors Financing and Incentives Program that will be reviewed and finalized with the corresponding directive to make the adoption and implementation of the program official.

109. Continuous monitoring and evaluation system will be established and a series of meetings to discuss issues being met by the EE Motors Financing and Incentives Program will be held to exchange and share experience among manufacturers/suppliers and other relevant agencies to realize a better execution and broader effect of the planned EE Motors Financing and Incentives Program. Correspondingly, success stories and lessons learned which are exchanged in meetings will be summarized and further disseminated.

GEF support is for the technical assistance required in the review of policies, the development of the detailed plan of EE Motors Financing and Incentives Program, the organization of experience exchanging meetings and the assessment on operational performance of the EE Motors Financing and Incentives Program.

Output 3.3: Developed and implemented suitable business models for local financial institutions to support EE motor production and application

110. *Activity 3.3: Development and implementation of suitable business models to support EE motor production and application.* The activity will focus on the development[14] and implementation of new business models derived from the approved detailed plans in Activity 3.2 that can yield sustainable profits for investors to support EE motor manufacturing and application, the effectiveness of business models will be tested through operating demonstration projects before they can be duplicated and promoted in other provinces/cities.

111. This activity will involve work in incorporating in the business models the financial incentives developed and recommend a promotion strategy and plan in parallel with the information and awareness activities of the project EE motor manufacturers that will be carried out in Component 4. Based on the results of the Techno-Economic Feasibility Study on the EE production side and the continuing consultation with the electric motor industry players, business models that will be used by financial institutions in making financial assistance available and accessible will be developed. These models are for EE motor manufacturers for the implementation of their manufacturing plant conversions to EE motor technology. Such schemes will be designed to aid the manufacturers in making their operation viable while the EE motor sales volume is still starting to pick up. A qualification scheme for selecting EE motor manufacturers to this program will be part of the activity.

112. In accordance with the implementation plan, a total of 4 demonstration projects will be launched in 2-3 provinces/cities during the 2nd and 3rd year of the GEF-supported project. Then assessment on the performance of the demonstration projects will be conducted, which will be applied to a) the promotion of business models of best practices in future; and b) the further understanding of the market mechanism of EE motor promotion.

113. Moreover, based upon the activities mentioned above, policy proposals for the improvement of the market mechanism of EE motor promotion will be completed and submitted to the related national administrative department.

[14] The business model development shall make use of the findings of the survey and analysis on China electric motor industry about existing business models, especially on their ways of making profits, in the field of EE motor manufacturing and application. The possible business models to make EE motor manufacturing and application viable will be introduced or developed, of which the most viable ones will be selected for the subsequent piloting after carrying on further comparative analysis. As part of the outputs of the activity, an implementation plan of running demonstration projects for verifying the selected business models will be drafted and approved by responsible agency.

GEF support is for the technical assistance required in the conduct of survey and analysis of the China electric motor industry, design new business models, planning and implementation of the demonstrations, evaluation of the performance of demonstrations and formulation of policies.

Output 3.4: Operational appropriate EE motor incentive mechanism

114. *Activity 3.3: Design and operationalization of an EE motor incentive mechanism such as a rebate program for electric motor users.* This activity will involve the review of existing incentives electric motor users and establish a specific and an updated EE motor rebate program that is meant for the replacement of old, low efficiency electric motors (10 kW and above). The rebate program that MIIT and Shanghai MG plan to implement will be reviewed and updated. This aims to encourage consumers to replace their standard electric motors with EE motors (HEM and REM). The idea under the program is to carry this out through some sort of a rebate scheme that involves exchanging standard electric motors with EE motors. The customers will receive lower price for new EE motor units if they send their old standard electric motors to: (a) EE motor dealers for exchanging with new EE motors; or (b) to REM manufacturers for remanufacturing. It is estimated that at least tens of millions of dollars will be provided by the Government as required for the implementation of a pilot project of the rebate program. This could also be the provisions for the co-financing expected for the Component (around 1.5 million US dollars). Through the implementation of EE motor rebate program EE motors will obtain more market share attributed to the phase-out acceleration of low efficient electric motors.

115. The activity will focus on exploring a more practical rebate program i.e. old-for-new subsidy scheme to formulate related policy proposals for its wider implementation, on the basis of study on existing rebate programs and industrial chain of electric motors recycling and remanufacturing, and evaluation on existing local EE motor pilot rebate programs.

116. A survey and investigation on the industrial supply chain of electric motors recycling and remanufacturing will be carried out by on-site visit of electric recycling and manufacturing producers, consultation with experts in the electric motor industry, review of related research reports and so on, which is also essential and useful for the subsequent policy proposals. Furthermore, survey on the existing EE motor pilot rebate programs such as that launched by Shanghai municipality, and assessment on their operational performance will be carried out, for which special focus will be put on findings. Based upon the above survey and assessment, policy proposals on a rebate program for wider application will be put forward, which will then be submitted to the related national administrative department afterwards.

117. The activity aims to have the proposals on EE motor rebate program adopted and implemented starting with pilot demonstration of the rebate scheme and funding support in selected key cities by the responsible administrative department. A monitoring and evaluation system will also be developed and implemented to keep track of the progress as well as documentation of the results and lessons learned of the rebate program. Based on the overall evaluation of the effectiveness of the rebate scheme in promoting EE motors to end-users, a recommendation for its wider application to other cities will be submitted to the government before the end of the project.

    GEF support is for the technical assistance required in the design and operationalization of a suitable/applicable EE motor incentive mechanism.

COMPONENT 4: ENERGY EFFICIENT ELECTRIC MOTOR PROMOTION

118. Component 4 will focus on addressing the low level of awareness about, and lack of accessible information on technologies and techniques in the design and production of EE motors (HEMs and REMs). Few Chinese HEM and REM manufacturers are aware of, or adequately know, the latest technologies and techniques for the design and production of EE motors, and improving the efficiency of old and potentially recyclable electric motors. This is further aggravated by the difficulties in accessing the rather limited information about such technologies/techniques particularly on REMs. In the case of REMs, such EE motors are not easily identifiable and recognizable to most electric motor users as these are difficult to distinguish them from the standard electric motors. Consequently the users lack confidence and interest in buying such products. There is also a dearth of information about REMs, their quality and performance. The expected outcome from the various deliverables under this component is **increased market share of energy efficient electric motors.**

119. To achieve Outcome 4, the following are the Activities to be carried out under Component 4 to deliver each of the Expected Outputs listed below:

Outcome	Output	Activities
Increased market share of energy efficient electric motors	4.1: Established and operational electric motor market monitoring system	4.1: Establishment and operationalization of electric motor market monitoring system
	4.2. Regularly disseminated publication of local EE motors market and product performance information.	4.2.1: Development and production of PREMCI achievement promotional videos and brochures
		4.2.2: Dissemination of publication of local EE motors market and product performance information
	4.3. Established guidelines on government procurement for EE motor (HEM &REM)	4.3: Development and issuance of guidelines for EE motor (HEM &REM) government procurement system.
	4.4. Operational EE motor (HEM and REM) manufacturer incentive program	4.4: Promotion of PREMCI achievements and access to EE motor (HEM and REM) manufacturer financial models and incentive program
	4.5. Completed industrial consumer education campaigns on EE motor (HEM and REM) applications	4.5: Industrial consumer education campaigns on EE motor (HEM and REM) applications
	4.6. Sustainable follow-up plan for the replication of the project interventions in collaboration with electric motor manufacturers in other Chinese cities	4.6: Development and implementation of a sustainability and follow-up plan for the replication of the successful project interventions in collaboration with electric motor manufacturers in other Chinese cities

Output 4.1: Established and operational electric motor market monitoring system

120. *Activity 4.1: Establishment and operationalization of electric motor market monitoring system.* This activity focuses on making available and reliable data provided by the market tracking system which can be updated at least on a quarterly basis[15]. It will involve dynamic market model design, input data collection, system trial operation, and yearly published

[15] Nationally, very limited accessible market information on HEMs and REMs is available in terms of their prices, market share, performance, etc. To promote HEMs and REMs in China, the establishment and operationalization of such a market monitoring system is essential to obtain basic data and information derived from them.

electric motor market information. It will address the problem of lack of motor market information and data in China, and will provide the basis for other market pull activities in this component.

GEF support is for the technical and logistical assistance required in the design, establishment and operationalization of the EM market monitoring system.

Output 4.2: Regularly disseminated publication of local EE motors market and product performance information.

121. *Activity 4.2.1: Development and production of PREMCI achievement promotional videos and brochures.* The activity aims to document comprehensively the PREMCI achievements and progress towards achieving the desired outcomes and to disseminate them to garner more support for the HEM program. It will highlight the achievements of the project; encourage the research, design, and manufacture of the HEM products through the project achievements; and promote the further improvement of HEM market in China, in line with the ultimate goal of the project.

122. It will involve the preparation of a PREMCI Promotional and Communication Plan to determine its overall strategy, key messages to be communicated with target audiences and elements to present the project goals and objectives and updates on the achievements of the project. The plan will determine the activity timetable for producing the promotional videos and brochures from the collection of video footages, pictures, write-ups and other materials about the project. These information materials will be the basis for drafting the key messages to be incorporated in the visual promotion videos and informative brochures. To obtain a wider effect, the promotion videos and brochures should be used in combination with the above-mentioned two activities and other relevant project milestone achievements.

GEF support is for the technical and financial assistance in the design of the Promotional and Communication Plan and production of the promotional videos and brochures.

123. *Activity 4.2.2: Dissemination of publication of local EE motors market and product performance information.* This activity will focus on the dissemination of knowledge products produced by the project to various target audiences, including electric motor manufacturers/assemblers and end-users. It will involve the preparation and dissemination of relevant published data and information. It will see to it that the needs of the various stakeholders and beneficiaries will be provided the pertinent information needed on a timely basis.

GEF support is for the financial/logistical assistance in the dissemination and delivery of information packages.

Output 4.3: Established guidelines on government procurement for EE motor (HEM &REM)

124. *Activity 4.3: Development and issuance of guidelines for EE motor (HEM &REM) government procurement system.* This activity will involve the development of an active government procurement system that mandates the budgeting for and purchase of high efficiency electric motors manufactured locally and rated and certified as HEMs and REMs. It will involve the drafting, development, deliberation, approval and publication of the procurement guideline for EE motors. From the point of view of electric motor manufacturers and industrial supplier groups, this program is a welcome practice and if made operational, the procurement guidelines issued by reliable agencies will guide them

to produce and supply the government's requirements as a ready market while also developing the bigger market in the industrial user groups.

125. Currently, there is no such procurement guideline for EE motors. A review of existing government procurement programs for other products will be part of this activity. The experiences and lessons learned from some existing guidelines[16] could be used in formulating a similar system for EE motors that could be added on to the overall government procurement program for other products. Currently in China, government gets used to issue mandatory technical standards/specifications rather than procurement guidelines. However, according to international experience, procurement guidelines are more appropriate for market-based development, and it is also a trend of China's development in the next 20 years. Therefore, a procurement guideline produced by this project will be meaningful.

126. Based on yearly updated motor market data and information in **Activity 4.1**, as well as response and feedback from disseminated information packages in **Activity 4.2**, the EE motors (for HEMs and REMs) procurement guidelines can be formulated. It is the intention to make such guidelines adopted and published by responsible government agency.

GEF support is for the required technical assistance in the development and implementation of the proposed government procurement schemes for EE motors, and in the development of templates for mass purchasing agreements.

Output 4.4: Operational EE motor (HEM and REM) manufacturer incentive program

127. *Activity 4.4: Promotion of PREMCI achievements and access to EE motor (HEM and REM) manufacturer financial models and incentive program.* The activity will start with the identification of promotion strategy, the key messages to be communicated with target audiences and the project goal, objective and the updates on the achievements of the project. The plan will determine the activity timetable for producing the promotional videos and brochures from the collection of video footages, pictures, write-ups and other materials about the project. These information materials will be the basis for drafting the key messages to be incorporated in the visual promotion videos and informative brochures. To obtain a wider effect, the promotion videos and brochures should be used in combination with the above-mentioned two activities and other relevant project milestone achievements.

128. The PREMCI achievements and progress towards achieving the desired outcomes will be comprehensively documented under this activity. The documents produced will be disseminated to garner more support for the HEM and REM program. It will highlight the achievements of the project; encourage the research, design, and manufacture of the HEM products through the project achievements; promote easy access to financial windows and incentive programs and promote the further improvement of HEM market in China, in line with the ultimate goals of energy saving and GHG reduction the project.

129. This activity will focus on the strategic and expanded information and promotion assistance in providing and accessing incentives to the EE manufacturers who need strategic information to base their investment decisions on the experiences in the financing models and incentive schemes developed and piloted in Component 3. It also differs from the training activities described above in Component 2 because it will involve promotional strategies and working linkages with the financial and banking sector, the government

[16] Some examples of procurement guidelines issued by the government include: 1) Green Procurement Guideline by Shanghai Bao Steel Group (state-owned); 2) Drinking Water Pipeline System Procurement Guideline by government.

particularly the MIIT and the Ministry of Finance, the manufacturers through the EE Motor Industry Association and industrial user groups in expanding the market for EE motors. Currently, only limited number of HEM and REM manufacturers has the opportunity to share these vital information and advice in the industry. This activity and its expected outputs will attract manufacturers to fully exchange idea and information on alternative EE motor technologies, business opportunities, success stories and best practice in the industry through business forums. Linked with Activities 3.2, 3.3, 3.4, and other relevant activities of the project including those that will be done by the government in connection with existing similar incentive programs, this activity will be active in pursuing the objectives, technical quality and business opportunities in a greatly expanded EE motor production and application in China.

GEF support is for the technical assistance required in the strategy and plan for promoting access to EE motor (HEM and REM) manufacturer financial models and incentive program.

Output 4.5: Completed industrial consumer education campaigns on EE motor (HEM and REM) applications

130. *Activity 4.5: Industrial consumer education campaigns on EE motor (HEM and REM) applications.* This activity will focus on providing the target EE motor users in the various industries in China vital information on how to identify efficient electric motor products and the benefits of purchasing these products. The campaigns will be backed up by the government's consumer protection programs to enhance the users' acceptance of EE motors. Currently, electric motor manufacturers and users have limited access to technical and economic information resulting to their low level of awareness about the technical advantages and economic benefits of HEMs and REMs application. This education campaign activity will be designed to increase the level of awareness and knowledge and to attract the interest of manufacturers, assemblers and users of HEMs and REMs in industrial applications.

131. Moreover, this activity will also involve awarding of certificates of recognition to successful EE motor applications which will be selected through a nomination and rating process vis-à-vis an agreed selection criteria that will be conducted at the regional and national level independently or together with other energy efficiency and conservation awards system of the government.

GEF support is for the required technical assistance in the design and implementation of the awareness enhancement programs and awards system through consumer education schemes.

Output 4.6: Sustainable follow-up plan for the replication of the project interventions in collaboration with electric motor manufacturers in other Chinese cities.

132. *Activity 4.6: Development and implementation of a sustainable follow-up plan for the replication of the successful project interventions in collaboration with electric motor manufacturers in other Chinese cities.* This activity will focus on other cities and areas where the best practices and lessons learned from the pilot demonstration sites can be replicated and promoted. This will involve support from central and local government agencies, private sectors, and other academic institutions for the replication of feasible design and application of EE motor application, design and manufacturing of energy efficient motors, widespread utilization of such equipment/appliances in the industrial sector, enforcement of policies and policy support activities, and implementation of financing schemes for related projects that promote EE motor production and application in other Chinese cities. Replication is an integral component of the project design as the

expected energy savings from the utilization of energy efficient motors (and the corresponding GHG emissions reduction from the reduced electricity demand) rely on the replication of the relevant project activities of PREMCI in many parts of China where there large industrial complexes.

133. A monitoring and evaluation system for the follow-up and replication program will also be designed and adopted by responsible agency of the Chinese government before the end of the project.

GEF support is for the technical assistance required in the development of the sustainable follow-up plan for the replication of the EE motor demos to EM manufacturers and industrial users in other Chinese cities.

2.7 Key Indicators and Risks

134. The following are the key outcome success indicators and targets of PREMCI by the end of this 4-year project or as indicated if earlier:

- Cumulative CO_2 emissions reduction in the application of EE motors by end-of-project (EOP) of 7,986 kilotons (ktons)
- Reduction in the annual growth rate of GHG emissions by EOP compared to that in Year 3 at 14.7 %
- Electricity savings due to project intervention by EOP of 5,559 GWh/yr
- Percent of the local electric motor manufacturers in China producing HEMs and REMs by EOP of at least 40%
- Average annual HEM production output by EOP at 89 million Kw
- Average annual REM production output by EOP at 4 million Kw
- Cumulative capacity of low-efficiency electric motors phased-out at 160 million Kw
- At least 10 people gainfully employed in each newly established EE electric motor production facilities by EOP
- No. of local electric motor manufacturers that produce EE motors by EOP at 800
- No. of electric motor suppliers/retailers that sell EE motors by EOP at 1,000
- % annual growth rate (YOY) of HEM production in the demonstration pilot companies starting Year 3 of at least 10%
- % annual growth rate (YOY) of REM production in demonstration pilot companies starting Year 3 of at least 10%
- No. of EM manufacturers that produce EE motors (HEM/REM) by EOP at 920
- No. of Chinese industries that use locally made EE motors by EOP using HEMs at 90,000
- No. of Chinese industries that use locally made EE motors by EOP using REMs at 10,000 companies
- Percent of market share of EE motors by EOP at 33%
- Average annual volume of EE motor sales by EOP at 93,000 MW

135. The achievement of the envisioned alternative scenario is very dependent in the market development and user response in the use of EE motors. **Annex I** presents the critical (mostly market-related) risks listed below, risk analysis, rating and mitigation action that the project will take in addressing them so that the above outcomes will be realized:

- Individual vested interests and objectives of local electric motor manufacturers as well as other stakeholders in the local and central governments may prevent the effective organization and coordination of their participation and support of the project.

- The level of co-financing amount may not support the project implementation promptly and sufficiently.
- The end-users may not like to buy or use EE motors, particularly REMs.
- HEM manufacturers may not support EMR because REMs can compete with HEMs.
- Recommended policies may not be approved by the relevant authorities, or may be approved but not effectively enforced.

136. It should be noted also that there are potential risks based on the assumptions stated in the PPM. These will be managed as per the Risk Log in Annex 1, including securing the commitment and support of the GoC and its relevant agencies in ensuring that the recommended policy adoption and approval will happen within the GEF project duration.

2.8 Cost Effectiveness

137. While the country has already initiated policies and actions to promote EE motors production and utilization in the country, and there are other ongoing broad energy efficiency programs that have components on EE electric motors and motor systems, these rather limited and general actions are not sufficient to remove the identified barriers, create and sustain enabling environments, and facilitate or at least influence the increased investments in EE motor production and their widespread application in industries. Without GEF support for funding the incremental cost for removing the barriers that this proposed project will address, the expected potential additional global environmental benefits (in terms of avoided CO_2 emissions linked from the electricity that will be saved) would not be realized. Without this project, China would have limited success in promoting the widespread utilization of EE motors, especially for the REMs; in increasing use of the HEMs; and, in the phasing-out of existing energy inefficient electric motors. Such efforts will be at a relative low level, and the potential contribution to the country's GHG emissions reduction targets as well as the country's aim to conserve energy and protect both the global and local environment will not be realized. With the GEF support for the incremental cost needed, the much needed market pull and technology push to remove the barriers will be realized. That in turn will facilitate increased share of HEMs and REMs in the local electric motor market, and realize the expected reduction in GHG emissions.

138. The incremental funding from GEF to realize the envisioned alternative scenario for this project will make a critical difference in the promotion of the widespread application of EE electric motors (HEM/REM) in China, thus implying a high level of cost-effectiveness. The proposed project will facilitate the realization of the expected outcomes through barrier removal and other capacity development and technical assistance activities. The proposed approach of removing barriers builds on the successful experience in the implementation of other GEF-funded equipment-based energy efficiency projects in China. In the case of this project, the barrier removal approach is also considered as more appropriate, holistic and cost effective, considering that: (1) Electric motors are commonly used in small to big industries in the country; (2) China is a major electric motor manufacturing and consuming country; and, (3) Locally manufactured electric motors are relatively lower in efficiencies compared to foreign brands. The option of just relying on individual electric motor users switching to EE electric motors would have only limited success. The impacts would also be limited to those that are directly involved in individual and uncoordinated EE electric motor application initiatives, compared to the proposed approach, which includes a interventions to create enabling environment (policy/regulations, financial/fiscal incentives), as well as for disseminating the results of, and lessons learned from, EE electric motor production techniques and EE electric motor applications

139. The anticipated global environmental benefit through the implementation of this project is the avoided GHG emissions from the utilization of locally manufactured HEMs and REMs. This will result to cumulative electricity savings of 9,982 GWh by 2019 at the end of the

project; and a projected value of 191,220 GWh in 2029 and 427,531 GWh/yr in 2035. These electricity savings will translate into millions of dollars of avoided investments in new power plants and cumulative CO_2 emissions reductions equivalent to 7,986 ktons CO_2 by end of project. Considering the GEF contribution of US$ 3,500,000 and the anticipated direct CO_2 emission reduction of 44.47 ktons CO_2 and 10 years economic life of equipment, the unit abatement cost is about US$ 0.08/t CO_2[17].

140. The anticipated global environmental benefits accruing at the end of the 4-year project through the implementation of this project include the following:

- Expected cumulative amount of GHG emission reduction of 7,986 ktons CO_2 avoided during the project duration from the utilization of locally manufactured EE motors. This is based on the cumulative energy savings of 9,982 GWh that are realized from the use of EE motors
- Direct post project CO_2 emission reduction is 0 since there is no financial mechanism that supports directly the shift to HEM/REM.
- Lifetime direct CO_2 emission reduction of 44.47 ktons CO_2

Table 8: PREMCI Global Environmental Benefits

I – Direct	**Quantity**
Cumulative direct emission reductions during project duration, ktons CO_2	7,986
Lifetime direct CO_2 emission reduction (DER), ktons CO_2	44,470
II - Direct post project	
Direct post project CO_2 emission reductions (DPPER) [if anticipated], ktons CO_2	0*
III – Indirect	
Indirect CO_2 emissions - bottom-up (ktons CO_2)	133,410
Indirect CO_2 emissions - top-down (ktons CO_2)	153,358

*This is supposed to include ERs from HEM/REM application that result from direct assistance from PREMCI (e.g., for HEM/REM manufacturers and users) and the results are realized after PREMCI project completion; which means that the HEMs/REMs are purchased and attributable to PREMCI or purchased through financing that the project established. Either one of these is not the case, hence the DPPER is 0.

141. This projection describes how the electric motors market trend will be most probable in line with steady economic development in the country and its growth for past few years and is expected to continue for the next 10-20 years. Cost-effective efficiency improvements require investments over the short-term, but these investments will return over more than twice as much over the same period. Since the project includes only electric motor types for which technical feasibility and cost-effectiveness can be clearly demonstrated, the benefits determined represent only a subset of the economy-wide potential. In addition, the electric motor technologies to be analyzed for HEMs and REMs represent a small segment of what is currently on the Chinese market. Technological innovations are certain to happen over the coming decades, and the project will trigger further developments and new opportunities for efficiency improvement. As the electric motor market is transformed to cater to more efficient varieties, the increased market share will definitely exert downward effects on unit costs of EE motors. This will also bring down the monthly power bills of the industries that will induce a lowering of prices of all the varied consumer items that will be produced.

[17] This is much lower than the carbon price for the 7 existing China carbon trading schemes which range from €3 to €7/ton: http://www.rtcc.org/2015/01/06/china-carbon-trading-to-almost-double-in-2015/#sthash.roAVZ9TQ.dpuf

142. As a major activity of the project, a market monitoring system will be established and sustained even after the project as the means to keep track on the realization of such benefits and how information (including relevant disaggregated data) will be collected, processed, evaluated and reported during the project implementation in Activity 4.1. This system will be designed in detail after the project inception as well as devise mechanisms for continuous improvement.

3. SUSTAINABILITY AND REPLICABILITY

143. Innovativeness and Sustainability: A clearly innovative aspect of this proposed project is the inclusion of interventions that will focus on the EMR industry in China. Apart from the barriers faced by the local electric motor industry in promoting and expanding its EE motor business, the emerging EMR industry in China also has its current policy, capacity and technology related problems that need to be addressed in an integrated manner to help pave the way for a rather very promising development.

144. PREMCI ensures long-term sustainability of the EE motor program for China. Component 1 of the project will lay the legal, regulatory and policy framework on the production and application of EE motors that will be developed and adopted in close consultation with the private sector (e.g. electric motor manufacturers, suppliers/retailers and electric motor users) with active leadership of the relevant government agencies in China. This will make the EE motor program imperative and institutionalized to have long-term impact and benefits. The capacity building of the institutions and organizations involved to be done in Component 2 will develop competency and ensure that a continuing program will be maintained. Component 3 on investments for necessary facilities and training to realize the energy efficiency enhancement in electric motor technologies will see to it that the modifications in the manufacturing lines will be geared towards the desired improvement in the quality and dependability of EE motors that will be manufactured in the country anchored in a sustained technology development program. The promotional aspect of the project in Component 4 is likewise supportive in the sustainability objectives of the PREMCI. The regulations and the standards developed, adopted officially and disseminated effectively to guide the prototyping and commercialization of EE motor models during and beyond the project. With strong commitment and participation of relevant government agencies and industry players, there is no doubt that the PREMCI alternative strategy will be sustained over the years and will therefore deliver the expected outcomes on increased production and use of EE motors in the country.

145. A sustainable follow-up action plan will be developed that will scale-up and replicate the project interventions in other Chinese cities, particularly where there is a large industrial sector. Since the target electricity savings and GHG emission reductions will come from electric motor users that would be influenced by the results of the project, the private sector (e.g., electric motor manufacturers and electric motor users) will be sufficiently consulted in the design and implementation of such action plan and the support frameworks that the project will establish.

146. Potential for Scaling-up: The potential for a wider application of EE motors is quite high, especially for REMs. Hence, a project such as what is being proposed can be considered innovative since there have been no initiatives yet on the promotion of EMR and the utilization of REMs, especially in the industry sector in China. The activities that will be carried out under this proposed project are barrier removal in nature. To ensure avoidance of the recurrence of the barriers and the continuance of the enabling environments that will be created and/or facilitated by the project, appropriate sustainable follow-up actions will be planned as part of the project activities. Such action plan will be implemented after the project as per the institutional arrangements that will be developed for such purpose. In addition, the removal of barriers and the effective and seamless implementation of the

procedures and regulatory/policy and institutional frameworks that will be established will surely influence the scaling-up of the project, e.g., to cover other local electric motor manufacturers, or to facilitate the trading of locally made EE motors (HEMs and REMs) to other countries.

2. PROJECT RESULTS FRAMEWORK:

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: *Low carbon and other environmentally sustainable strategies and technologies are adapted widely to meet China's commitments and compliance with Multilateral Environmental Agreements*
Country Programme Outcome Indicators: *Cumulative CO_2 emissions reductions from 2011-2015; Baseline: 2011 Zero; Target: 2015 under UNDP supported project at 70 million tons CO_2 reduction*
Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): *Mainstreaming environment and energy*
Applicable GEF Strategic Objective and Program: *Promote market transformation for energy efficiency in industry and the building sector*
Applicable GEF Expected Outcomes: *Reduction of GHG emissions from the generation of electricity consumed by electric motors from thermal power generation plants*
Applicable GEF Outcome Indicators: *Cumulative CO_2 emissions reduction by end-of-project (EOP), ktons*

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
GOAL: Reduction of greenhouse gas (GHG) emissions through the widespread application of energy efficient electric motors in China	• Cumulative CO_2 emissions reduction in the application of EE motors by end-of-project (EOP), *ktons*	• 0	• 7,986	• Documentation of annual data on electric motor energy consumption in Chinese industries from MIIT[18].	• GoC commitment to EE remains firm and private sector fully supports the program • .Continuous support of relevant GoC agencies and private sector even after PREMCI
	• Reduction in the annual growth rate of GHG emissions by EOP compared to that in Year 1, *%*	• 0	• 14.7		
OBJECTIVE: **Increased manufacturing and widespread application of energy efficient**	• Electricity savings due to project intervention by EOP, *GWh/yr* • Percent of the local electric motor manufacturers in China producing HEMs and REMs by EOP, *%*	• 0. • 5% • Limited or negligible[20]	• 5,559 • At least 40% • 102.1 million	• PREMCI M&E system reports. • Electric motor market monitoring report on EE motor manufacturing	

[18] This will be monitored using the M&E system that will be developed under the project

[20] Currently, there is no official statistics in China on the production and sales of HEMs/REMs. The available information are those on the production data from 6 pilot electric motor manufacturing companies that were supported by MIIT to produce energy efficient electric motors, as well as from manufacturers in Shanghai, where the percentage of industrial enterprises using HEMs and REMs is 6.5% and 1.4%, respectively. The project development team considered half of the said percentages for Shanghai as representative for China in Year 1. There are around 350,000 industrial enterprises in China, and that number has been almost constant since 2011. For the rest of project years, the increasing rate of the enterprises using HEM and REM was assumed to follow the increasing rate of the annual production of HEM and REMs within the project period. This applies to all baseline values = "Limited or negligible"

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
electric motors[19] in China	• Average annual HEM production output by EOP, kW • Average annual REM production output by EOP, kW • Cumulative capacity of low-efficiency electric motors phased-out, kW • No. of people gainfully employed in newly established EE electric motor production facilities by EOP	• Limited or negligible • Limited or negligible • 0	• 4 million • 106.1 million • At least 10 per company	• Survey reports and reports from the industries	
COMPONENT 1: POLICY AND REGULATORY FRAMEWORKS ON THE PRODUCTION AND APPLICATION OF ENERGY EFFICIENT ELECTRIC MOTORS (EE MOTORS)					
Outcome 1: Enhanced and clearly defined policy enforcement mechanisms on the production EE motors and their applications in the Chinese industrial sector	• No. of local electric motor manufacturers that produce EE motors by EOP • No. of electric motor suppliers/retailers that sell EE motors by EOP.	• Limited or negligible • Limited or negligible	• 800 • 1,000	• Report on the evaluation of policies and recommendations • Documentation of approved comprehensive program on EE motors and their application in Chinese industrial industries • Documentation and reports on the EE electric motor production and sales by the industry	• The length of time that policy adoption and approval will happen within the project duration
COMPONENT 2: ENERGY EFFICIENT ELECTRIC MOTOR PRODUCTION AND APPLICATIONS					

[19]Energy efficient electric motors (EE Motors) include both high efficiency motors (HEMs) and remanufactured electric motors (REMs). Electric motor remanufacturing (EMR) involves the retrofitting of low-efficiency electric motors through redesign, parts replacement and application of advanced electric motor techniques to produce high-efficiency remanufactured electric motors (REMs). The difference between EMR and electric motor rewinding is that the former results in a product (i.e., REM) that has higher efficiency than the original electric motor, while the latter results in the restoration of the operational functions of the original electric motor but at the expense of, at best, a unit percentage reduction in efficiency. Electric motor rewinding is the traditional way of extending the life of electric motors and is done to burned-out electric motors.

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
Outcome 2: Increased local production of EE motors for applications in Chinese industries	• % annual growth rate (YOY) of HEM production in the demonstration pilot companies starting Year 3 • % annual growth rate (YOY) of REM production in demonstration pilot companies starting Year 3	• Nil • Nil	• At least 10%[21] • At least 10%[22]	• Original production and operation records of HEM and REM manufacture and electric motor recycling support system • Special product survey monitoring reports	• Most EE motor manufacturers are interested to participate in the project demonstration and after the demonstration they will produce EE motors
COMPONENT 3: FINANCIAL SUPPORT & ACCESSIBILITY IMPROVEMENT					
Outcome 3: Increased application of domestically produced EE Motors(HEMs and REMs)in Chinese industries	• No. of EM manufacturers that produce EE motors (HEM/REM) by EOP • No. of Chinese industries that use locally made EE motors by EOP • Using HEMs • Using REMs	• 115[23] • Limited or negligible	• 920 • 90,000 • 10,000	• Monitoring reports on HEM/REM production	• Motor users are happy with their EE motors or that they utilize their EE motors rationally and properly
COMPONENT 4: ENERGY EFFICIENT ELECTRIC MOTOR PROMOTION					
Outcome 4: Increased market share of energy efficient electric motors	• % of market share of EE motors by EOP • Average annual volume of EE motor sales by EOP, MW	• Nil • 1,100	• 33% • 106,100	• PREMCI Project M&E reports • PREMCI Project annual reports • Electric motor market research reports conducted under the PREMCI Project	• Continued support by relevant agencies of the Government of China and all the stakeholders and companies • Cooperation of the EM manufacturers in market research surveys is ensured.

[21] This is equivalent to an overall increase of 30% at EOP compared to the baseline year
[22] This is equivalent to a final increase of more than 60% compared to the baseline year
[23] According to the survey of MIIT, currently there are about 2300 EM manufacturer in China, in which only 5% producing HEM. The target of the proposed project is to increase the ratio of HEM and REM manufacturer to at least 40%.

3. TOTAL BUDGET AND WORK PLAN

Award ID:	00086680	**Project ID:**	00093919
Award Title:	Promoting Energy Efficient Electric Motors in Chinese Industries (PREMCI)		
Business Unit:	CHN10		
Project Title:	Promoting Energy Efficient Electric Motors in Chinese Industries (PREMCI)		
PIMS no.	5121		
Implementing Partner (Executing Agency)	Ministry of Industry and Information Technology (MIIT)		

GEF Outcome / Atlas Activity	Responsible Party / Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	Atlas Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)	See Budget Note:
Outcome 1: Enhanced and clearly defined policy enforcement mechanisms on the production EE motors and their applications in the Chinese industrial sector	MIIT	62000	GEF	71200	International Consultants	5,000	20,000	45,000	60,000	130,000	**1**
	MIIT	62000	GEF	71300	Local Consultants	10,000	24,000	0	0	34,000	2
	MIIT	62000	GEF	71400	Contractual Services - Individual	10,000	20,000	20,000	20,000	70,000	3
	MIIT	62000	GEF	71600	Travel	35,000	20,000	55,000	50,000	160,000	4
	MIIT	62000	GEF	72100	Contractual Services - Companies	65,000	85,000	75,000	0	225,000	5
	MIIT	62000	GEF	72200	Equipment and Furniture	0	0	10,000	10,000	20,000	6
	MIIT	62000	GEF	72500	Supplies	0	1,000	0	0	1,000	7
	MIIT	62000	GEF	74200	Audio Visual & Print Prod Costs	10,000	0	0	0	10,000	8
	MIIT	62000	GEF	74500	Miscellaneous Expenses	0	5,000	0	0	5,000	9
	MIIT	62000	GEF	75700	Training, workshops and conference	55,000	0	40,000	50,000	145,000	10
	Total Outcome 1					**190,000**	**175,000**	**245,000**	**190,000**	**800,000**	
Outcome 2: Increased local production of EE motors for applications in Chinese industries	MIIT	62000	GEF	71200	International Consultants	55,000	75,000	55,000	35,000	220,000	11
	MIIT	62000	GEF	71300	Local Consultants	16,000	28,000	29,000	14,000	87,000	12
	MIIT	62000	GEF	71400	Contractual Services - Individual	311,110	225,000	125,000	10,000	671,110	13
	MIIT	62000	GEF	71600	Travel	53,500	70,110	56,110	41,000	220,720	14
	MIIT	62000	GEF	72100	Contractual Services - Companies	142,500	167,000	136,500	59,500	505,500	15
	MIIT	62000	GEF	72500	Supplies	1,000	2,000	2,000	2,000	7,000	16
	MIIT	62000	GEF	74500	Miscellaneous Expenses	0	4,000	4,000	4,000	12,000	17
	MIIT	62000	GEF	75700	Training, workshops and conference	0	60,000	60,000	60,000	180,000	18
	Total Outcome 2					**579,110**	**631,110**	**467,610**	**225,500**	**1,903,330**	
Outcome 3: Increased	MIIT	62000	GEF	71200	International Consultants	12,000	18,000	17,500	10,500	58,000	19
	MIIT	62000	GEF	71400	Contractual Services - Individual	47,000	23,000	14,500	16,000	100,500	20

GEF Outcome / Atlas Activity	Responsible Party / Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	Atlas Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)	See Budget Note:
application of domestically produced EE Motors(HEMs and REMs)in Chinese industries	MIIT	62000	GEF	71600	Travel	10,500	12,500	10,000	8,500	41,500	21
	MIIT	62000	GEF	72100	Contractual Services - Companies	40,500	15,000	18,000	13,000	86,500	22
	MIIT	62000	GEF	72500	Supplies	2,000	3,500	6,000	6,000	17,500	23
	MIIT	62000	GEF	73100	Rental & Maintenance - Premises	2,000	4,000	6,000	6,000	18,000	24
	MIIT	62000	GEF	74500	Miscellaneous Expenses	2,000	2,000	2,000	2,000	8,000	25
	Total Outcome 3					**116,000**	**78,000**	**74,000**	**62,000**	**330,000**	
Outcome 4: Increased market share of energy efficient electric motors	MIIT	62000	GEF	71200	International Consultants	6,000	15,000	5,000	5,000	31,000	26
	MIIT	62000	GEF	71300	Local Consultants	40,000	27,000	27,000	22,000	116,000	27
	MIIT	62000	GEF	71400	Contractual Services - Individual	1,500	1,500	1,500	1,500	6,000	28
	MIIT	62000	GEF	71600	Travel	3,000	2,000	2,000	2,000	9,000	29
	MIIT	62000	GEF	72100	Contractual Services - Companies	11,000	14,000	11,500	11,500	48,000	30
	MIIT	62000	GEF	72500	Supplies	1,000	0	0	0	1,000	31
	MIIT	62000	GEF	74200	Audio Visual & Print Prod Costs	0	14,000	9,000	9,000	32,000	32
	MIIT	62000	GEF	74200	Audio Visual & Print Prod Costs	5,000	16,000	16,000	16,000	53,000	33
	MIIT	62000	GEF	74500	Miscellaneous Expenses	1,000	1,000	1,000	1,000	4,000	34
	Total Outcome 4					**68,500**	**90,500**	**73,000**	**68,000**	**300,000**	
TOTAL ALL OUTCOMES						**953,610**	**974,610**	**859,610**	**545,500**	**3,333,330**	
Project Management	UNDP	62000	GEF	71200	International Consultants	15,000	15,000	15,000	15,000	60,000	35
	MIIT	62000	GEF	71300	Local Consultants	15,000	15,000	15,000	15,000	60,000	36
	MIIT	62000	GEF	71600	Travel	3,184	3,184	3,183	3,183	12,734	37
	MIIT	62000	GEF	74100	Professional Services	5,000	5,000	5,000	5,000	20,000	38
	MIIT	62000	GEF	74500	UNDP Cost Recovery Charges	1,317	1,317	1,316	1,316	5,266	39
	MIIT	62000	GEF	71400	Contractual Services - Individual	2,180	2,160	2,164	2,166	8,670	40
	Total Project Management Cost					**41,681**	**41,661**	**41,663**	**41,665**	**166,670**	
TOTAL PROJECT COST						**995,291**	**1,016,271**	**901,273**	**587,165**	**3,500,000**	

BUDGET NOTES:

1	International consultants for: (a) policy studies, regulatory framework, strategic planning, M&E, and investment studies for HEM, REM and phase out of IEMs; and (b) survey design and planning about the local electric motor industry vis-à-vis international perspective
2	Local consultant counterparts for local and national data and information requirements for studies and surveys
3	Contractual Services for individual technical assistance for policy studies and surveys
4	Local travel for the various activities and field work for policy formulation
5	Contractual services for survey work, analysis and publication of results
6	Equipment for word processing, internet access and computer software operations, office communications, and duplicating machines and the necessary furniture to mount them in connection with policy studies and related information storage and retrieval systems
7	Supplies for office materials and consumables for the policy studies and planning services
8	Printing and publication of materials produced for the policy studies and the EE Motor Production and Application Strategic Policy and Plan
9	Miscellaneous expenses for the preparation and adoption of recommended system for EE performance standards, testing protocols
10	Conferences, workshops, seminars and meetings for policy studies and surveys
11	International consultants for EE design standards, design software/tools, certification and design/planning for HEM/REM manufacturing demonstration projects and related capacity development
12	Local consultant counterparts of the international consultants in providing technical assistance to EE Motor manufacturers in EE motor design, production and application, training, design software and modelling
13	Contractual Services for individual technical assistance for design works, standards, certification, training and demonstration
14	Local travel for the various activities, technical working group and field work for related works
15	Contractual services for (a) institutional development and implementation for the National EE Motor Research Center and China EE Motor Industry Association; (b) EE standards for integrated HEM application, (c) HEM certification system, (d) various related activities, and (e) identification and implementation HEM/REM demonstration projects
16	Supplies for the start-up and initial year operation and office requirements of National EE Motor Research Center and China EE Motor Industry Association
17	Miscellaneous expenses for the initial year operation and office requirements of National EE Motor Research Center and China EE Motor Industry Association
18	Exhibition, training, workshops and conferences for the dissemination of information and training/workshops on improved EE motor product design and production through holding of national HEM and REM achievement exhibitions annually for Year 2 to 4 .
19	International consultants for techno-economic feasibility studies, action planning, financial mechanisms, business modelling and incentive mechanisms for EE motor production and application

20	Contractual services for individual professionals for support to international consultants in the conduct of techno-economic feasibility studies, planning, business modelling and operationalization of EE motor incentive mechanisms
21	Travel for related activities and conferences and meetings
22	Contractual services for (a) implementation of financing initiatives and incentive mechanisms and (b) business models
23	Supplies for office materials and computer requirements in the financial studies and modelling for EE motor production and application.
24	Rental &maintenance for transportation requirements in the financial studies and modelling for EE motor production and application
25	Miscellaneous expenses for office materials and computer requirements in the financial studies and modelling for EE motor production and application
26	International consultants for (a) designing and implementation of electric motor market monitoring system and (b) sustainability plan for the replication program
27	Local consultants as national counterparts of International consultants for the design, establishment and operationalization of the electric motor market monitoring system
28	Contact services for individual professionals for developing and implementing a government procurement system
29	Travel for related activities and conferences and meetings
30	Contract services for companies in industrial consumer education campaigns and promotion of financial models and incentive systems.
31	Supplies for materials office and information dissemination an promotion of government guidelines for the incentives programs
32	Audio visual productions for related project outputs and promotional activities
33	Printing and publication of related materials and brochures
34	Miscellaneous expenses for sundries and other project management requirements
35	International consultants as Chief Technical Advisor, and as technical assistance consultant for inception meeting, developing and preparing M&E system and reports in coordination with UNDP/GEF
36	Local consultants as counterpart for assisting the international consultants on technical assistance, project management, monitoring and evaluation
37	Travel for related activities and conferences and meetings
38	Professional services for project management, monitoring and related activities (Audit)
39	Direct Project Costs (DPC) for UNDP Services
40	Contractual services for technical assistance in other project management functions

Table 9: PREMCI Cost Sharing Matrix (US$) from Government and Industry

Project Components	GEF Funding (US$)	Co-financing (US$)			Totals
		Industry	Government	Total Co-financing	
Component 1: Policy and Regulatory Frameworks on the Production and Application of EE motors	800,000	370,000	1,530,000	1,900,000	2,700,000
Component 2: EE Motors Production and Applications	1,903,330	10,108,670	1,848,330	11,957,000	13,860,330
Component 3: Financial Support & Accessibility Improvement	330,000	623,600	876,400	1,500,000	1,830,000
Component 4: EE Motors Promotion	300,000	545,000	955,000	1,500,000	1,800,000
Total All Components	3,333,330	11,647,270	5,209,730	16,857,000	20,190,330
Project Management	166,670	143,000	700,000	843,000	1,009,670
Grand Totals	3,500,000	11,790,270	5,909,730	17,700,000	21,200,000
% Share in Total Project Cost, %	*16.5*	*55.6*	*27.9*	*83.5*	*100.0*

Table 10: Summary of Funds (US$)

Sources of Funds	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Totals
GEF	**995,291**	**1,016,271**	**901,273**	**587,165**	**3,500,000**
CO-FINANCING					
Government					
Cash	475,000	532,000	551,000	342,000	1,900,000
In-kind	260,000	270,000	280,000	190,000	1,000,000
Total Government	**735,000**	**802,000**	**831,000**	**532,000**	**2,900,000**
Industry					
Cash	1,400,000	2,600,000	3,600,000	2,400,000	10,000,000
In-kind	1,755,000	900,000	945,000	900,000	4,500,000
Total Industry	**3,155,000**	**3,500,000**	**4,545,000**	**3,300,000**	**14,500,000**
Co-financing Totals	**3,890,000**	**4,302,000**	**5,376,000**	**3,832,000**	**17,400,000**
TOTALS	**4,885,291**	**5,318,271**	**6,277,273**	**4,419,165**	**20,900,000**
UNDP					300,000
GRAND TOTAL					**21,200,000**

Table 11: Summary of Cost of each Project Component

Project Strategy	GEF Budget (US$)	Co-financing (US$)									Totals
		Government			Industry			Total Co-finance			
		in kind	in cash	Total	in kind	in cash	Total	in kind	in cash	Total	
Component 1: Policy and Regulatory Frameworks on the Production and Application of Energy Efficient Electric Motors	800,000	880,000	650,000	1,530,000	280,000	90,000	370,000	1,160,000	740,000	1,900,000	2,700,000
Component 2: Energy Efficient Electric Motor Production and Applications	1,903,330	1,848,330	-	1,848,330	9,996,670	112,000	10,108,670	11,845,000	112,000	11,957,000	13,860,330
Component 3: Financial Support & Accessibility Improvement	330,000	130,200	746,200	876,400	347,450	276,150	623,600	477,650	1,022,350	1,500,000	1,830,000
Component 4: Energy Efficient Electric Motor Promotion	300,000	670,000	285,000	955,000	388,000	157,000	545,000	1,058,000	442,000	1,500,000	1,800,000
Total All Components	**3,333,330**	**3,528,530**	**1,681,200**	**5,209,730**	**11,012,120**	**635,150**	**11,647,270**	**14,540,650**	**2,316,350**	**16,857,000**	**20,190,330**
Project Management Cost	166,670	440,000	260,000	700,000	120,000	23,000	143,000	560,000	283,000	843,000	1,009,670
Grand Totals	**3,500,000**	**3,968,530**	**1,941,200**	**5,909,730**	**11,132,120**	**658,150**	**11,790,270**	**15,100,650**	**2,599,350**	**17,700,000**	**21,200,000**

4. MANAGEMENT ARRANGEMENTS

As practiced in all UNDP/GEF-supported projects, UNDP always endeavors to seek adaptive management approach in the implementation of projects. Based on the partnerships defined and firmed up during the project development, the management arrangements have always been anchored on co-operation and mutual sharing of benefits where accountability and responsibility for implementing the project and achieving the project outputs.

Such arrangement should also be based on collective decision making through a Project Steering Committee (PSC) composed of the project key stakeholders, viz., Ministry of Industry and Information Technology, Ministry of Science and Technology, Standardization Administration of China, Dept. of Energy Conservation in Local Governments and UNDP. The PREMCI Project Organizational Structure is seen in **Figure 5** below:

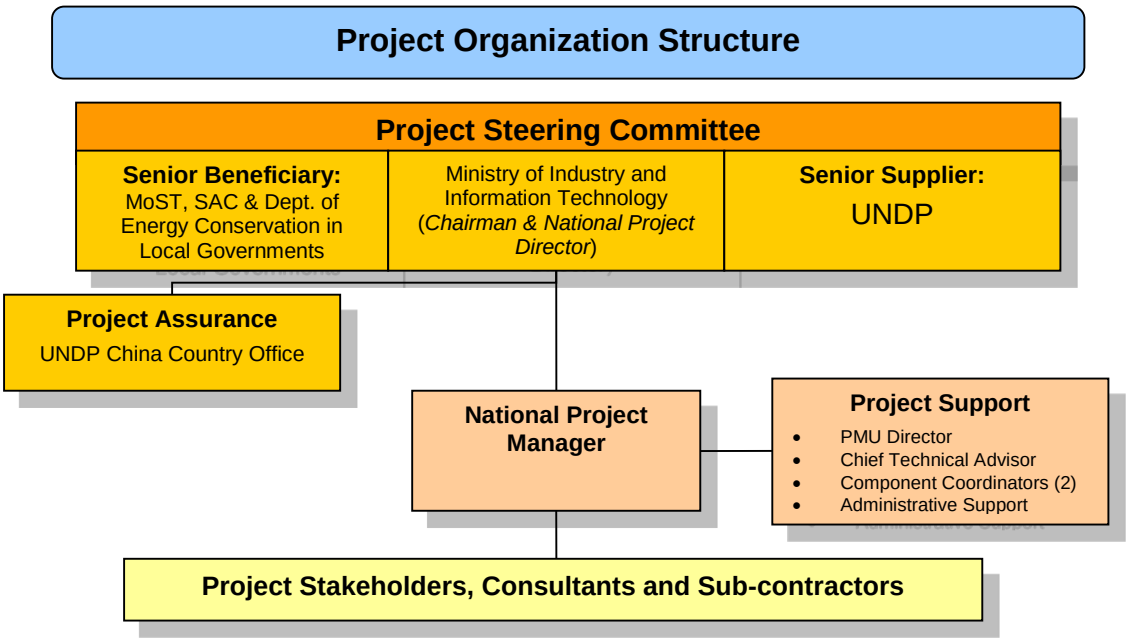

Figure 5: PREMCI Project Organizational Structure

A Project Steering Committee (PSC) will be established and will be composed of the representatives of the UNDP-China, and the participating government agencies: Ministry of Industry and Information Technology (MIIT), Ministry of Science and Technology (MOST), Standardization Administration of China, Department of Energy Conservation in Local Governments and the Director of the Project Management Unit (PMU). The National Project Director (NPD) and the National Project Manager (NPM) will come from the Executing Agency which is the Ministry of Industry and Information Technology and be appointed by the Government of China through the MIIT.

The PSC will play the role of policy and decision making body for the project implementation. The PSC members will also be invited to participate in the annual project review meetings. The Chairperson of the PSC is the designated NPD. The NPM provides the management oversight to the whole project and assists the NPD in the operational and industry sectoral aspects of the project implementation. The PMU will be established to be responsible for day-to-day coordinating and implementing the activities of the project and carrying out the prescribed monitoring system. The PMU Director will serve as the Secretary of the PSC.

PREMCI will be through a National Implementation Modality (NIM) on behalf of the Government of China through MIIT as the UNDP's Implementing Partner. The Implementing Partner will assume

the overall responsibility of ensuring that all activities are executed accordingly and as per the approved Project Document. The NPD will be responsible for the achievement of the project objectives through institutional coordination with the key stakeholder members of the PSC and overall alignment of the PREMCI Project with the relevant national EE programs of China. He/she takes overall responsibility for all projects' timely reporting, including the submission of Annual Work Plans (AWP), Annual Project Report/Project Implementation Review (APR/PIR) 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 NPM shall also see to it that the Executing Agency (MIIT) supports the project in the planning, coordination, secretariat, administration and financial management of the project in coordination with UNDP China Country Office.

The PSC will be responsible for the following: (a). Reviewing of annual progress reports for necessary guidance; (b) Reviewing and approving the annual work plans and budgets; (c) Providing guidance on the effectiveness of PREMCI project implementation, and its linkages to corporate UNDP policy decisions, and other UNDP initiatives; and, (d) Monitoring and evaluating the implementation of PREMCI towards the intended outputs, after two (2) years of project execution. As a minimum, the PSC 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. The first PSC meeting should be held within the first 12 months following the inception workshop.

UNDP-China, in close coordination with the UNDP-GEF Regional Technical Advisor for Climate Change in the Asia-Pacific Region will carry out the GEF oversight and ensure that expected project performance standards are met. It will be also responsible for monitoring and evaluation (M&E), including organizing project reviews, approving annual implementation work plans and budget revisions, monitoring progress, identifying problems, suggesting actions to improve project performance, facilitating timely delivery of project inputs, and provide linkages to other sub-regional, Asia-Pacific regional and global initiatives. All M&E functions will be carried out in line with standard UNDP and UNDP-GEF procedures. UNDP China will also provide country office support for all the activities of the project as coordinated with the Executing Agency.

A Project Management Unit (PMU) will be established and is responsible for the day-to-day management of all the project activities including those on capacity building, demonstration sub-projects and dissemination activities at the national level. The PMU will be managed by a National Project Manager (NPM), who will be supported by the Chief Technical Advisor (CTA), administrative staff and at least two Coordinators with one (1) coordinator to coordinate activities under two (2) Components, e.g. Component 1&2 and Component 3&4. The CTA provides strategic technical support and advice to ensure that the project is implemented according to the agreements in the Project Document and the standards of UNDP and GEF in project implementation.

A Technical Advisory Committee (TAC) will be established with the main responsibility of providing the necessary expert advice in the implementation of technical aspects of the implementation of the various project components.

The PREMCI Project will be implemented for four (4) years. If the GEF funding will be approved in around 4th quarter of 2014, it is anticipated that the project will start early 2015 and will be completed by the end of 2019.

The PREMCI Management Team will prepare its overall country 4-year work plan at the inception stage of the project based on the project activities that are described in this Project Document., specifying the level of activities that will be carried out for the year, the targets to be achieved, and the corresponding inputs (in terms of manpower and budget). During the inception stage, the Executing Agency with assistance of the PMU will prepare its first year work plan and submit this to the UNDP China to be approved for the allocation of funds for the implementation initial year activities. Succeeding annual work plans, based on the results of the previous year and the planned activities for the current year, will be prepared and submitted for approval and budget allocations at the start of each year.

Also during the inception stage, the PREMCI Management Team will prepare its overall 4–year M&E plan based on the overall country work plan, and also based on the PREMCI Project Planning Matrix (Section II, Part II), PREMCI Annual Targets (**Annex IV**) and PREMCI Project Monitoring Plan. The M&E plan will consist of success indicators (output and impact) with realistic targets and time lines, and backed up with clear means of verification, and assumptions. Each activity/task will be carried out and monitored in terms of the appropriate output indicators (for the activity deliverables) and the impact indicators (for the impacts). The targets will be reviewed each year and any necessary revision or adjustment of these, as well as the assumptions will be done on a continuous basis during the life of the project as part of adaptive management.

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 PREMCI Project 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.

5. MONITORING FRAMEWORK AND EVALUATION

The project will be monitored through the following M& E activities. The M& E budget is provided in the table below.

Project Start:

A Project Inception Workshop will be held <u>within the first 2 months</u> of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

The Inception Workshop should address a number of key issues including:

a) Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis-à-vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
b) Based on the project results framework and the relevant GEF Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
c) Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
d) Discuss financial reporting procedures and obligations, and arrangements for annual audit.
e) Plan and schedule Project Board meetings. Roles and responsibilities of all project organization structures should be clarified and meetings planned. The first Project Board meeting should be held <u>within the first 12 months</u> following the inception workshop.

An <u>Inception Workshop</u> report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

- 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.

Annually:

- Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

  The APR/PIR includes, but is 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.

Periodic Monitoring through site visits:

UNDP CO and the UNDP-GEF Asia-Pacific 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 Project Board may also join these visits. A Field Visit Report/BTOR 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 Project Board members.

Mid-term of project cycle:

The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation (insert date). 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 Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC).

The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

End of Project:

An independent Final Evaluation will take place three months prior to the final Project Board 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 Regional Coordinating Unit and UNDP-GEF.

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).

The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.

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.

Learning and knowledge sharing:

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 will be a two-way flow of information between this project and other similar projects.

Communications and visibility requirements:

Full compliance is required with UNDP's Branding Guidelines. These can be accessed at http://intra.undp.org/coa/branding.shtml, and specific guidelines on UNDP logo use can be accessed at: http://intra.undp.org/branding/useOfLogo.html. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects needs to be used. For the avoidance of any doubt, when logo use is required, the UNDP logo needs to be used alongside the GEF logo. The GEF logo can be accessed at: http://www.thegef.org/gef/GEF logo. The UNDP logo can be accessed at http://intra.undp.org/coa/branding.shtml.

Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08 Branding the GEF%20final 0.pdf. Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.

Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

M& E Work Plan and Budget

Table 12: Project M&E Plan and Budget

Type of M&E Activity	Responsible Parties	Budget US$*	Time frame
Inception Workshop (IW)	• Project Manager /Executing Agency • UNDP China & UNDP/GEF RCU	• Included in Project Management	Within first 2 months of project start up
Inception Report (IR)	• Project Team (MIIT) • UNDP China & UNDP/GEF RCU	• Included in IW Budget	a) Draft IR available before IW b) Final IR available immediately following IW
Measurement of Means of Verification	• Project Manager /Executing Agency • Project team members	• Included in Project Management	Start, mid and end of project

Type of M&E Activity	Responsible Parties	Budget US$*	Time frame
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	• Oversight by UNDP-GEF RCU Technical Advisor and PM • Measurements by regional field officers and local IAs	• Included in Project Management	Annually prior to APR/PIR and to the definition of annual work plans
APR and PIR	• Project Team (MIIT) • UNDP China & UNDP-GEF RCU	• Included in Project Management	Annually
TPR and TPR report	• GOI Counterparts • UNDP China & UNDP-GEF RCU • Project Team (MIIT)	• Included in Project Management.	Every year, upon receipt of APR
PAC/Tripartite Review Meetings	• Project Manager /Executing Agency • UNDP China	• Included in IW budget	Following Project IW and subsequently at least once a year
Periodic status reports	• Project Team (MIIT)	• Included in Project Management.	To be determined by Project team and UNDP China
Technical reports	• Project Team (MIIT) • Hired consultants as needed	• Included in Project Management	To be determined by Project Team and UNDP China
Mid-term External Evaluation	• Project Team (MIIT) • UNDP- China & UNDP-GEF RCU • External Consultants (i.e. evaluation team)	• 30,000	At the mid-point of project implementation.
Final External Evaluation	• Project Team (MIIT) • UNDP China & UNDP-GEF RCU • External Consultants	• 30,000	At the end of project implementation
Terminal Report	• Project Team (MIIT) • UNDP China • External Consultant	• Included in Project Mgmt. budget	Two months before project end date.
Lessons learned	• Project Team (MIIT) • UNDP China & UNDP-GEF RCU	• Included in Project Mgmt. budget	Two months before project end date.
Audit	• UNDP China • Project Team (MIIT)	• Included in Project Management	Annually
Visits to field sites (UNDP staff travel costs to be charged to IA fees)	• UNDP China • UNDP-GEF RCU (as appropriate) • UNDP China/PAC representatives	• 5,000	Annually
TOTAL INDICATIVE COST*		US$ 80,000	

UNDP Support Services

MIIT has entered into an agreement with UNDP for direct project support services in the form of procurement of goods and services during the project implementation process (see Annex H). In such a case, appropriate cost recovery will be charged as per UNDP rules and regulations. The support services will be outlined in the form of Letter of Agreement signed between MIIT and UNDP. The table below indicates the cost of UNDP direct project services (DPS) anticipated over the project implementation period of four years.

ESTIMATE OF DIRECT PROJECT SERVICES (DPS) (US$)					
Year	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total (US$)**
ISS (support for recruitments, procurement, selection & awarding of sub-contracts, approvals, etc.)	1,317	1,317	1,316	1,316	5,266
Total (US$)	1,317	1,317	1,316	1,316	5,266

Audit Clause

Audit will be conducted according to UNDP Financial Regulations and Rules and applicable Audit policies. The Government of China will provide the UNDP Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNDP (including GEF) funds expended on the project according to the established procedures set out in the appropriate UNDP programming and finance manuals. The audit will be conducted by the legally recognized auditor of the Government of China, or by a commercial auditor engaged by the Government.

6. LEGAL CONTEXT

This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document. Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the Implementing Partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

The Implementing Partner shall:

a) Put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried; and,
b) Assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.
The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

7. ANNEXES

Annex I: Risk Analysis
Annex II: Agreements
Annex III: GHG Emission Reduction Estimates
Annex IV: Annual Targets
Annex V: Terms of Reference of Key Project Management Personnel
Annex VI: Details of Demonstrations
Annex VII: UNDP-GEF Environmental and Social Screening

Annex I: Risk Analysis

Table I.1: PROJECT OFFLINE RISK LOG

Project Title: Promoting Energy Efficient Electric Motors in Chinese Industries (PREMCI)	Project ID:	Date:

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Management Response	Owner	Submitted, updated by	Last Update	Status (compared with previous evaluation)
1	Individual vested interests and objectives of local electric motor manufacturers as well as other stakeholders in the local and central governments may prevent the effective organization and coordination of their participation and support of the project	2013-03-31	Political	P = 1 I = 4	MIIT, as project executing agency will closely coordinate the project implementation with the project partners utilizing its rich experience implementing energy management projects with government offices such as NDRC, MOF, MOST and MEP. In addition, the MIIT, apart from establishing an effective project team that will comprise of competent local and international experts in the field of electric motor systems and technology, will also make use of its current good working relationship with the Chinese electric motor industry.				
2	The level of co-financing amount may not support the project implementation promptly and sufficiently.	2013-03-31	Financial	P = 3 I = 5	The project team shall secure central government funding prior to project launching. During project implementation, the project team will closely monitor and ensure co-financing is available by project partners and co-financers promptly and at least as per their respective committed amounts.				
3	The end-users may not like to buy or use	2013-03-31	Technical and financial	P = 3 I = 5	The project will include information dissemination and promotion to ensure end-users better understanding about				

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Management Response	Owner	Submitted, updated by	Last Update	Status (compared with previous evaluation)
	EE motors, particularly REMs.				the use and benefits of using EE motors, particularly REMs. The project shall also include product certifications that are expected to encourage and influence end-users to purchase REMs.				
4	HEM manufacturers may not support EMR because REMs can compete with HEMs.	2013-03-31	Social	P = 1 I = 3	The project will work together with HEM manufacturers to come up with arrangements that would ensure that REMs are complementing rather than competing with HEMs in the supporting the government's objective of promoting energy efficiency in Chinese industries.				
5	Recommended policies may not be approved by the relevant authorities, or may be approved but not effectively enforced.		Political	P = 3 I = 4	The project will include the piloting of the application of the support policies for EE motors to gauge the effectiveness of said policies. That will help guide the relevant government authorities in the finalization, approval and effective enforcement of such policies.				

Annex II: Agreements.

United Nations Development Programme
联合国开发计划署

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Resilient nations.

3 February 2015

Dear Dr. Ishii,

Subject: Proposed Co-financing Commitment Letter from UNDP for GEF project "Promoting Energy Efficiency Electric Motors in Chinese Industry" (PREMCI)

Through the use of PPG fund, UNDP China developed a GEF project on "Promoting Energy Efficiency Electric Motors in Chinese Industry" (PREMCI). The project's objective is to enhance the manufacturing and widespread application of energy efficient electric motors in China.

This proposed GEF Project is closely aligned to the current United Nations Development Assistance Framework (UNDAF) 2011-2015, which the Government of China and the UN system, including UNDP, signed in March, 2010. As per the UNDAF, UNDP provides assistance in order that "Government and other stakeholders ensure environmental sustainability, address climate change, and promote a green, low carbon economy." UNDP expects to achieve this important outcome through the following outputs:

- Enhanced Government capacity to promote a low carbon economy through energy efficiency, renewable energy, and technological innovation.
- Government policies, and public and private enterprises, contribute to the creation of a green economy and green jobs.

To contribute to the achievement of these development objectives through the project, we wish to confirm that the UNDP Office in China will contribute USD 300,000 co-financing to the project. We are looking forward to the timely approval of this GEF project and thank you very much for your support.

Yours sincerely

Christophe Bahuet
Country Director

Dr. Naoko Ishii
CEO, Global Environment Facility

Copy to: Ms. Adriana Dinu, UNDP-GEF Executive Coordinator

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By fan.feng at 10:37 am, Feb 06, 2015

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中华人民共和国工业和信息化部

Co-Financing Letter

Dear Mr. Alain Noudehou
Resident Representative of UNDP China

This is to confirm that the China Government is committing co-financing support amounting to US$ 17,400,000 (including company's co-financing) to the implementation of the Promoting Energy Efficient Electric Motors in Chinese Industries in China.

National Government will be committing funds of a combined amounts of US$ 2,900,000, of which US$ 1,900,000 will be an in-cash contribution towards activities related to Energy Efficient motor promotion, motor stands, motor certification system, support for project management office expenses, etc, US$ 1,000,000 will be an in-kind contribution supporting project monitor, evaluation and project coordination, etc.

Local Governments (including companies) are committing funds of a combined amount of US$ 14,500,000, of which US$ 10,000,000 will be an in-cash contribution towards activities related to remanufactured electric motors manufacturing demonstration, remanufactured electric motors product research and development, Energy Efficient motor promotion, remanufactured electric motors research center, remanufactured electric motors testing facility, support for project management office expenses, etc, US$ 4,500,000 will be an in-kind contribution supporting project monitor and evaluation, project coordination, etc.

The Minister of Industry and Information Technology (MIIT) is willing to cooperate with the UNDP and other partners of the Promoting Energy Efficient Electric Motors in Chinese Industries in China over a period of 4 years and to utilize these funds as baseline contributions to Promoting Energy Efficient Electric Motors in Chinese Industries in China.

The support from the Chinese Government to the project is described in detail in the Project Document and associated budget. We assume that all of its direct costs associated with producing outputs described in the Project Document qualify as the project's co-financing.

Sincerely yours,

Mr. Gao Yunhu
Director General of the Department of Energy Conservation and Resources Utilization, MIIT

CC: International Department, MOF
Mr. Manuel Soriano UNDP-GEF Regional Technical Advisor, Asia and the Pacific Region

山东省经济和信息化委员会

Co-Financing Letter

Ministry of Industry and Information Technology (MIIT):

This is to confirm that the Shandong Provincial Government is committing co-financing support amounting to US$ 3,200,000(including company's co-financing) to the implementation of the Promoting Energy Efficient Electric Motors in Chinese Industries in China. The in-cash portion of these co-financing amounts to US$ 1,900,000 will be used for activities of REMs manufacturing demonstration, support for project management office expenses, etc. The in-kind portion amounting to US$ 1,300,000 will be used for activities of project M&E, project coordination, etc. The Shandong Provincial Government is willing to cooperate with the UNDP and other partners of the Promoting Energy Efficient Electric Motors in Chinese Industries in China over a period of 4 years and to utilize these funds as baseline contributions to Promoting Energy Efficient Electric Motors in Chinese Industries in China.

The Shandong Provincial Government's support to the project is described in detail in the Project Document and associated budget. We assume that all of its direct costs associated with producing outputs described in the Project Document qualify as the project's co-financing.

Sincerely yours,

Wang Xin

Mr. Wang Xin

Department of Shandong Economic and Information Technology Committee

Shandong Provincial Government

湖南省经济和信息化委员会

Co-Financing Letter

Ministry of Industry and Information Technology (MIIT):

This is to confirm that the Hunan Provincial Government is committing co-financing support amounting to US$ 3,100,000 (including company's co-financing) to the implementation of the Promoting Energy Efficient Electric Motors in Chinese Industries in China. The in-cash portion of these co-financing amounts to US$ 1,900,000 will be used for state activities of REMs manufacturing demonstration, support for project management office expenses, etc. The in-kind portion amounting to US$ 1,200,000 will be used for state activities of project M&E, project coordination, etc. The Hunan Provincial Government is willing to cooperate with the UNDP and other partners of the Promoting Energy Efficient Electric Motors in Chinese Industries in China over a period of 4 years and to utilize these funds as baseline contributions to Promoting Energy Efficient Electric Motors in Chinese Industries in China.

The Hunan Provincial Government's support to the project is described in detail in the Project Document and associated budget. We assume that all of its direct costs associated with producing outputs described in the Project Document qualify as the project's co-financing.

Sincerely yours,

Deng Guangliang

Mr. Deng Guangliang
Hunan Economic and Information Technology Commission

上海电器科学研究所（集团）有限公司

上研电机[2015]02 号

Co-Financing Letter

Ministry of Industry and Information Technology (MIIT):

This is to confirm that the Shanghai Electrical Apparatus Research Institute(SEARI) is committing co-financing support amounting to US$ 3,800,000 to the implementation of the Promoting Energy Efficient Electric Motors in Chinese Industries in China. The in-cash portion of these co-financing amounts to US$ 2,800,000 will be used for activities of REMs product R&D, EE motor rebate scheme, REMs testing center, REMs testing facility and support for project management office expenses, etc. The in-kind portion amounting to US$ 1,000,000 will be used for activities of support for project M&E, Project coordination, etc.SEARI is willing to cooperate with the UNDP and other partners of the Promoting Energy Efficient Electric Motors in Chinese Industries in China over a period of 4 years and to utilize these funds as baseline contributions to Promoting Energy Efficient Electric Motors in Chinese Industries in China.

SEARI's support to the project is described in detail in the Project Document and associated budget. We assume that all of its direct costs associated with producing outputs described in the Project Document qualify as the project's co-financing.

Sincerely yours,

Mr. Wu yehua

President of

Shanghai Electrical Apparatus Research Institute(Group) Co.,Ltd.

主题词： 配套资金 承诺函

上海电器科学研究所（集团）有限公司 2015 年 2 月 5 日印发

（共印 3 份）

安徽省经济和信息化委员会

Co-Financing Letter

Ministry of Industry and Information Technology (MIIT):

This is to confirm that the Anhui Provincial Government is committing co-financing support amounting to US$ 4,400,000 (including related companies' co-financing) to the implementation of the Promoting Energy Efficient Electric Motors in Chinese Industries in China. The in-cash portion of these co-financing amounts to US$ 3,400,000 will be used for activities of REMs product R&D, REMs manufacturing demonstration, REMs testing facility and support for project management office expenses, etc. The in-kind portion amounting to US$ 1,000,000 will be used for activities of support for project M&E, project coordination, etc. The Anhui Provincial Government is willing to cooperate with the MIIT and other partners of the Promoting Energy Efficient Electric Motors in Chinese Industries in China over a period of 4 years and to utilize these funds as baseline contributions to Promoting Energy Efficient Electric Motors in Chinese Industries in China.

The Anhui Provincial Government's support to the project is described in detail in the Project Document and associated budget. We assume that all of its direct costs associated with producing outputs described in the Project Document qualify as the project's co-financing.

Sincerely yours,

Mr. WenBin Ke
Anhui Province Economic and Information Commission
Anhui Provincial Government

STANDARD LETTER OF AGREEMENT BETWEEN UNDP AND THE GOVERNMENT FOR THE PROVISION OF SUPPORT SERVICES

Dear Mr. Gao Yunhu,
Director General of the Department of Energy Conservation and Resources Utilization, Ministry of Industry and Information Technology.

1. Reference is made to consultations between officials of the Ministry of Industry and Information Technology (hereinafter referred to as "the MIIT") and officials of UNDP with respect to the provision of support services by the UNDP country office for nationally managed programmes and projects. UNDP and MIIT hereby agree that the UNDP country office may provide such support services at the request of MIIT through its institution designated in the relevant programme support document or project document, as described below.

2. The UNDP country office may provide support services for assistance with reporting requirements and direct payment. In providing such support services, the UNDP country office shall ensure that the capacity of the MIIT-designated institution is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services shall be recovered from the administrative budget of the office.

3. The UNDP country office may provide, at the request of the designated institution, the following support services for the activities of the programme/project:
   a) Identification and/or recruitment of project and programme personnel;
   b) Identification and facilitation of training activities;
   c) Procurement of goods and services;

4. The procurement of goods and services and the recruitment of project and programme personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the programme support document or project document, in the form provided in the Attachment hereto. If the requirements for support services by the country office change during the life of a programme or project, the annex to the programme support document or project document is revised with the mutual agreement of the UNDP resident representative and the designated institution.

5. The relevant provisions of the Standard Basic Assistance Agreement between the Government of China and the United Nations Development Programme in China signed on January 29 1979 (the "SBAA"), including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The Government shall retain overall responsibility for the nationally managed programme or project through its designated institution. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the annex to the programme support document or project document.

6. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the SBAA.

7. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to the programme support document or project document.

8. The UNDP country office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.

9. Any modification of the present arrangements shall be effected by mutual written agreement of the parties hereto.

10. If you are in agreement with the provisions set forth above, please sign and return to this office two signed copies of this letter. Upon your signature, this letter shall constitute an agreement between your Government and UNDP on the terms and conditions for the provision of support services by the UNDP country office for nationally managed programmes and projects.

Yours sincerely,

_____
Signed on behalf of UNDP
Mr. Patrick Haverman
Deputy Country Director

Date: _____

_____
For the Government
Mr. Gao Yunhu
Director General of the Department of Energy Conservation and Resources Utilization, Ministry of Industry and Information Technology

Date: _____

Attachment

DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

1. Reference is made to consultations between MIIT, the institution designated by the Government of China and officials of UNDP with respect to the provision of support services by the UNDP country office for the nationally managed programme: Promoting Energy Efficient Electric Motors in Chinese Industries Between the Government of the People's Republic of China and United Nations Development Programme To Enable China to enhance the manufacturing and widespread application of energy efficient electric motors in China.

2. In accordance with the provisions of the letter of agreement and the programme project document, the UNDP country office shall provide support services for the Programme as described below.

3. Support services to be provided:

Support Services *(insert description)*	Schedule for the provision of the support services	Cost to UNDP of providing such support services *(where appropriate)*	Amount and method of reimbursement of UNDP *(where appropriate)*
1. Recruiting 4 specialists	As per AWPs	As Per UPL	Estimated amount: US$ 5,265.60
2.			
3.			

4. Description of functions and responsibilities of the parties involved is as per the project document. UNDP country office will provide the services as stated above upon the request of the Ministry of Industry and Information Technology. The reimbursement of the UNDP support cost will be recorded as per transactions based on the established UNDP financial regulations and rules.

Annex III: GHG Emission Reduction Estimates

1. Basic Assumptions

The basic assumptions in the calculation of the impacts on energy saving and emission reductions of the PREMCI are the following:

1) Assumed annual growth rate of sales volume of EE motor products is 6% for low-voltage electric motor and 10% for high-voltage electric motor, based on the related statistics of actual sales volumes from 2005-2012;
2) Assumed number of operational hours for EE motors 4,000 hrs with an average load factor of 65% based on available data on average industry experience;
3) Assumed average efficiency level of electric motors in 2013 of 86% for low-voltage electric motor and 92% for high-voltage electric motor based on available industry data;
4) Assumed efficiency improvements are 0.25% and 0.15% for low-voltage electric motor and high-voltage electric motor, respectively, in the BAU scenario. In the alternative scenario these are 0.45% and 0.25% for low-voltage electric motor and high-voltage electric motor, respectively.
5) Assumed CO_2 emission factor of 0.8 tCO_2/MWh. The estimated EF for the whole of China was calculated based on the 6 regional grids using the estimation methodology in Reference: http://cdm.ccchina.gov.cn/zyDetail.aspx?newsId=46143&TId=161
6) Using HEM or REM will result in the following:
   # Annual Electricity Savings = 158 kWh/kW
   # Annual GHG ER = 167 kg CO_2/kW
   # Annual GHG ER = 1.054 kg CO_2/kWh savings

CO_2 Emissions Reduction Estimates

Direct CO_2 Emission Reductions

Within the project intervention period, the project will be involved with demonstration and replication applications of HEM and REM.

Demonstration and Replication Plan on HEM/REM Production

	Baseline	Year 1	Year 2	Year 3	Year 4
A. Demonstration and replication of improved EE motor product design and manufacturing					
Pilot Demonstration		3 electric motor manufacturing enterprises applying 3 selected HEM prototype designs			
Replication Projects (directly assisted by PREMCI)[24]			Demonstration in selected enterprises in 2 -3 provinces	Demonstration in selected enterprises in 2 -3 provinces	Commercialization & plan for demonstration in other provinces and cities

[24] During the course of the PREMCI project implementation, there will be direct assistance provided to a number of HEM/REM manufacturers and users. These beneficiaries will implement their improved HEM/REM manufacturing initiatives. On the assumption that the EE electric motors (HEM/REM) that will be produced will be sold to and used by electric motor users, there will be energy savings (and CO2 emission reductions) that will be realized from such EE electric motor applications. If these HEM/REM manufacturers and users implement their HEM/REM initiatives during the PREMCI project period, the energy savings and corresponding CO2 emission reductions from these initiatives are considered part of the direct energy savings (and direct CO2 emission reduction) of the PREMCI project.

			(Shandong, Anhui,	(Shandong, Anhui,	
Target HEM Production, *MW*		10,000	30,000	60,000	102,100
B. Demonstration and replication projects of electric motor remanufacturing					
Pilot demonstration		3 electric motor manufacturing enterprises applying 3 selected REM prototype designs			
Replication Projects (directly assisted by PREMCI)[25]			Demonstration in selected enterprises in 2 -3 provinces (Shandong, Anhui, Hunan)	Demonstration in selected enterprises in 2 -3 provinces (Shandong, Anhui, Hunan)	Commercialization& plan for demonstration in other provinces and cities
Target REM Production, *MW*		1,000	2,000	3,000	4,000
TOTAL HEM/REM Production, *MW*		11,000	32,000	63,000	106,100
Annual Efficiency Improvement Low-voltage electric motor BAU at 0.25% / year PREMCI at 0.45% / year	86%	86.25% 86.45%	86.50% 86.90%	86.75% 87.35%	87.00% 87.80%
high-voltage electric motor BAU at 0.15% / year PREMCI at 0.25% / year	92%	92.15% 92.25%	92.30% 92.50%	92.45% 92.75%	93.60% 93.00%

Direct CO_2 Emission Reductions (DER)

The collective annual electricity consumption of the HEMs and REMs that will be sold is calculated as follows:

Electricity Consumption = (Total MW_{sold} X Operating Hours) / [Ave. Efficiency X (1+ Efficiency Improvement)$^{\text{No. of years from base year}}$] / Load Factor

Baseline Scenario (No PREMCI)
- Projected Demo and replication HEMs Electricity Consumption, GWH/yr = 493,665
- Projected Demo and replication REMs Electricity Consumption, GWH/yr = 19,340
- Total Electricity Consumption of Demo and replication HEMs & REMs by end of project = 513,005

Alternative Scenario (PREMCI)
- Projected Demo and replication HEMs Electricity Consumption, GWH/yr = 488,316
- Projected Demo and replication REMs Electricity Consumption, GWH/yr = 19,131
- Total Electricity Consumption of Demo and replication HEMs & REMs by end of project = 507,447

- Electricity savings due to PREMCI project intervention, GWh/yr = 5,559
- CO_2 emission reductions due to PREMCI project intervention, kt CO_2/yr = 4,447

[25] Same as Footnote 1.

- Cumulative electricity savings due to PREMCI intervention, GWh = 9,982
- Cumulative CO_2 emission reductions due to PREMCI project intervention, kt CO_2 = 7,986

- Average lifetime of HEMs/REMs = 10 years
- Overall Lifetime Direct CO_2 ERs (all demos) = 4,447 X 10 = 44,470 kt CO_2

Direct Post-Project CO_2 Emission Reductions (DPPER)

During the course of the PREMCI project implementation, there will be direct assistance provided to HEM/REM manufacturers and users. These beneficiaries will implement their HEM/REM initiatives and realize energy savings (and GHG emission reductions). However, not all of them are expected to implement their HEM/REM initiatives during the life span of the PREMCI project. Some may only do their HEM/REM applications and realize GHG emission reductions (from the electric motor energy savings) after the PREMCI project completion. Such GHG emission reductions can still be attributed to PREMCI as Direct Post Project Emission Reductions (DPPER). However, to be conservative in the estimates, the Lifetime DPPERs will be taken as zero.

Indirect CO_2 Emission Reductions

Bottom-up Approach (BUA)

In estimating the indirect emission reductions (IER) using the bottom-up approach, the sum of the lifetime DERs and lifetime DPPERs is multiplied by a replication factor. As a market transformation and demonstration project, the GEF prescribed value is 3. In this case, the IER (BUA) is: 44,470 x 3 = 133,410 kt CO2

Top-Down Approach

The 10-year influence period is taken to be 2021 to 2030.

- Forecast total LV EMs sold from 2021 to 2030 (MW) = 2,440,206
- Forecast total HV Ems sold from 2021 to 2030 (MW) = 3,105,203
- Forecast total Ems sold from 2021 to 2030 (MW) = 5,545,409
- Forecast total HEMs & REMs sold from 2021 to 2030 (MW) = 2,046,063
- Estimated Forecast Total Electricity Savings from using HEMs & REMs from 2012 to 2030 (GWh) = 323,278
- Estimated Forecast Total GHG ERs from using HEMs & REMs from 2012 to 2030 (tons CO2) = 306,715,253

Applying a Causality Factor of 0.50 (considering the enabling environment that the PREMCI project will create for the electric motor industry) to the total market potential equivalent to the lifetime direct emissions reduction of 306,715 ktons CO_2, the top-down approach lifetime indirect CO_2 emission reductions is about 153,358 ktons CO_2.

Summary of CO_2 Emission Reductions

- Direct CO_2 Emission Reduction (@ end-of-project) = 7,986 ktons CO_2
- Lifetime Direct CO2 Emission Reduction = 44,470 ktons CO_2
- Lifetime Direct Post Project CO_2 Emission Reduction = 0 ktons CO_2
- Lifetime Indirect CO_2 Emission Reduction (BU Approach) = 133,410 ktons CO_2
- Lifetime Indirect CO_2 Emission Reduction (TD Approach) = 153,358 ktons CO_2

Range of Indirect CO_2 Emission Reduction: 133.4 – 153.4 million tons CO_2

Annex IV: Annual Targets

Table IV.1: PREMCI Outcome Indicators and Annual Targets

Project Strategy	Indicator	Baseline	Targets			
			Year 1	Year 2	Year 3	Year 4 (EOP)
GOAL: Reduction of greenhouse gas (GHG) emissions through the widespread application of energy efficient electric motors in China	• Cumulative CO_2 emissions reduction in the application of EE motors by end-of-project (EOP), *ktons*	•	• 306	• 1,269	• 3,539	• 7,986
	• Reduction in the annual growth rate of GHG emissions by EOP compared to that in Year 1, *%*			• 14.3	• 14.6	• 14.7
OBJECTIVE: **Increased manufacturing and widespread application of energy efficient electric motors[26] in China**	• Cumulative electricity savings due to project intervention by EOP, *GWh*	• 0.	• 382	• 1,586	• 4,424	• 9,982
	• Percent of the local electric motor manufacturers in China producing HEMs and REMs by EOP, *%*	• 5%	• At least 5%	• 10%	• 20%	• at least 40%
	• Average annual HEM production output by EOP, *Kw*	• No estimate	• 10 million	• 30 million	• 60 million	• 102.1 million
	• Average annual REM production output by EOP, *Kw*	• No estimate	• 1 million	• 2 million	• 3 million	• 4 million
	• Cumulative capacity of low-efficiency electric motors phased-out, *Kw*	• No estimate	• 1 million	• 50 million	• 100 million	• 160 million
	• No. of people gainfully employed in newly established EE electric motor production facilities by EOP	• 0	• At least 2 per company	• At least 5 per company	• At least 7 per company	• At least 10 per company
Outcome 1: Enhanced and clearly defined policy enforcement mechanisms on the production EE motors and their applications in the Chinese industrial sector	• No. of local electric motor manufacturers that produce EE motors by EOP	• No estimate	• 200	• 400	• 600	• 800
	• No. of electric motor suppliers/retailers that sell EE motors by EOP.	• No estimate	• 100	• 300	• 600	• 1,000

[26]Energy efficient electric motors (EE Motors) include both high efficiency motors (HEMs) and remanufactured electric motors (REMs). Electric motor remanufacturing (EMR) involves the retrofitting of low-efficiency electric motors through redesign, parts replacement and application of advanced electric motor techniques to produce high-efficiency remanufactured electric motors (REMs). The difference between EMR and electric motor rewinding is that the former results in a product (i.e., REM) that has higher efficiency than the original electric motor, while the latter results in the restoration of the operational functions of the original electric motor but at the expense of, at best, a unit percentage reduction in efficiency. Electric motor rewinding is the traditional way of extending the life of electric motors and is done to burned-out electric motors.

Project Strategy	Indicator	Baseline	Targets			
			Year 1	Year 2	Year 3	Year 4 (EOP)
Outcome 2: Increased local production of EE motors for applications in Chinese industries	• % annual growth rate (YOY) of HEM production in the demonstration pilot companies starting Year 3	• Nil			• At least 7%	• At least 10%
	• % annual growth rate (YOY) of REM production in demonstration pilot companies starting Year 3	• Nil			• At least 7%	• At least 10%
Outcome 3: Increased application of domestically produced EE Motors (HEMs and REMs) in Chinese industries	• No. of EM manufacturers that produce EE motors (HEM/REM) by EOP	• 115[27]	• 335	• 500	• 710	• 920
	• No. of Chinese industries that use locally made EE motors by EOP • Using HEMs • Using REMs	• No estimate[28]	• 10,000 • 2,500	• 30,000 • 5,000	• 60,000 • 7,500	• 90,000 • 10,000
Outcome 4: Increased market share of energy efficient electric motors	• % of market share of EE motors by EOP	• Nil	• 4%	• 11%	• 21%	• 29%
	• Average annual volume of EE motor sales by EOP, MW	• 1,100	• 11,000	• 32,000	• 63,000	• 93,000

[27] According to the survey of MIIT, currently there are about 2,300 EM manufacturer in China, in which only 5% producing HEM. The target of the proposed project is to increase the ration of HEM and REM manufacturer to at least 40%.

[28] Currently, there is no such statistic in China. Hence, the following assumption and methodology were used. According to the incomplete statistics, currently in Shanghai, the percentage of industry enterprises using HEMs and REMs is 6.5% and 1.4%, respectively. Considering that Shanghai is more industrially advanced than most places in China, half of the said percentages for Shanghai was used for the Year 1 throughout China based on the number of China's industry enterprises of around 350,000. This figure has been almost stable since 2011. For the rest of project years, the increasing percentage of the enterprises using HEM and REM was assumed to follow the increasing percentage of the annual production of HEM and REMs within the project period.

Annex V: Terms of Reference of Key Project Management Personnel

Project Director, Project Management Unit (PMU)

Level of Effort: 30 person-months over 4 years

Scope of Work:

The PREMCI Project is a 4-year project designed to i**ncrease manufacturing and widespread application of energy efficient electric motors in China**. The day-to-day operational management of the Project will be the responsibility of the PMU based within the designated Executing Agency of MIIT for the project. A Project Steering Committee (PSC) will be established to act as a Project Board for overall guidance and approval of key project activities including fund commitments and co-financing arrangements. It shall be the role of the PMU to undertake the following activities under the PMU Director's direct responsibility:

- Coordination with the PMUs of other related on-going projects for the purpose of facilitating the implementation of top management's decision on delineation of project thrusts and direction
- Preparation of work plans, budget, and TORs of consultants, trainers, and subcontractors;
- Assist MIIT in the selection and hiring of other national professionals, administrative staff and subcontractors needed in the Project;
- Monitoring and evaluation of progress of project activities;
- Arranging of regular review meetings and ensuring effective coordination of project activities;
- Preparation and dissemination of project reports and other information materials. The primary goal of this activity will be to enhance the transparency of project implementation.
- Oversee the financial record-keeping and internal control management of the PMU and the Project as a whole;
- Submission of timely and accurate financial reports and progress reports to UNDP
- Provide technical and administrative support for the initial operation of the PSC.

The Director of the PMU will take responsibility for the management and administration of the PREMCI Project. He/she will report directly to the MIIT and UNDP in the overall operation and management of the Project with the following functions:

- Be ultimately responsible for the fiscal management of the project
- Manage the PMU staff and be responsible for ensuring high staff performance and motivation
- Directly and indirectly manage and coordinate multi-faceted local and international consultant contracts to ensure their timely completion and high quality
- Manage the monitoring and evaluation of both the overall project and its components
- Be responsible for ensuring that project objectives are being met in terms of budget and project outputs and must be prepared to recommend changes to the PSC to ensure that all outputs are realized over the project life
- Be the primary project advocate and representative and meet regularly with stakeholders from the public, the electric motor industry, relevant agencies of Government of China and international donors to further project objectives.

Specific responsibilities will include:

- Regular reporting to MIIT and PSC on the status of the project activities;
- Synthesis of the works and outputs of consultants and subcontractors to identify potential issues and problems
- Chairing of the quarterly Project Monitoring Committee meetings;
- Preparation of quarterly financial and project progress reports;
- Preparation of annual work plans (AWP), annual project reports (APR), Project Implementation Review (PIR) and others as required by the UNDP.

Qualifications and Experience:

- A university graduate of business, science or engineering course
- At least 10 years of proven track record of project management experience preferably in the area of energy;
- Senior management reporting skills;
- Excellent English communication skills, both written and verbal. Skilled presenter of ideas in one-on-one situations, conferences and meetings;
- Proven track record of experience in successful contract management;
- A self-motivated individual with good leadership skills capable of planning, initiating and managing multi-disciplinary activities within the context of a multi-donor international project;
- An understanding of and links with the Chinese electric motor industry.

Position: Chief Technical Advisor

Level of Effort: 10 person-months over 4 years
Scope of Work:

To provide technical oversight and assistance to the Project Management Unit (PMU) through the PMU Director. The CTA will:

- Advise the PMU on the implementation of the project so as to ensure that it satisfies its objectives and targets and meets the requirement of the MIIT as Executing Agency and UNDP and GEF;
- Provide advice and technical inputs in the review of outputs by consultants hired under the component activities;
- Actively participate in Technical Working Groups (TWGs), various teams and other ad-hoc task forces for the conduct of specific activities and tasks under the Project;
- Provide technical inputs in the preparation of annual work plan (AWP), annual project reports (APR), project implementation review (PIR), and others as required by the UNDP and PMU Director;
- Provide technical inputs to the conduct of the project Mid-Term Review and Terminal Evaluation and drafting and implementation of the Action Plan to address the Terminal Evaluation Recommendations;
- Act as PMU deputy in various meetings, workshops and other activities, as may be instructed by PMU Director;
- Provide suggestions for resolving problems and barriers as they emerge in the process of implementation, especially in external communications, and in meeting various aspects of UNDP working processes and practice;
- Provide other support services as may be required by PMU Director.
- Conduct synthesis of the works, reports and other outputs of consultants and subcontractors involved in the Project;
- Assist PMU to organize and arrange international workshops, conferences and surveys.

Required Deliverables:

- An inception report identifying key issues, tasks and schedules for the project;
- In-country trip reports at the completion of each visit to China;
- Annual reports complete with strategies to address key issues to be addressed.

Qualifications and Proven Experience:

- Having a Master or Doctorate degree in engineering, economics or other scientific/technical field with relevance to energy efficiency;
- More than 5 years working experience in energy efficiency area, particularly in electric motor production and application;
- Having extensive experience in energy efficiency program development and implementation;
- Demonstrated experience in capacity development initiatives in developing countries, notably at the systemic, institutional and technical levels;
- Having technical knowledge on energy efficiency of typical products;
- Understanding well the project participating countries' economic, energy and environment situation;
- Strong existing relationships with energy efficiency institutions as well as a ready-network of international experts;
- Strong coordinative capability with international and domestic experts; and,
- Excellent spoken and written English capability.

Position: Component Coordinators

Duration: 4 years

Responsibilities:

There will be two (2) Component Coordinators: one (1) for Component 1 & 2 and another for Components 3 & 4 under the PMU. He/She will report directly to the PMU Director and be responsible for:

- Providing support in the smooth operation of the PREMCI Project by being directly responsible for the oversight management of various aspects of the Project Components assigned to him/her as required and for the regular monitoring and reporting of progress to the PMU Director
- The promotion of Component activities and services amongst existing and potential energy-efficient electric motor manufacturer and user;
- The production and dissemination of educational and information materials relevant to overcoming the main barriers to EE motor production and application;
- The planning and programming of events under the project;
- The promotion of the PREMCI mechanisms, capacity building and technical support to EE motor manufacturers and users;
- Other responsibilities that may be assigned by the PMU Director towards the effective delivery of outputs under the Component.

Qualifications and Experience:

- A relevant degree in business, engineering or economics;
- With working knowledge in computer-aided management;
- Proven experience and background in energy efficiency project development and EE motor production, application and marketing and promotion issues;
- Proven experience with the planning and development of promotional materials
- Ability to understand and communicate technical and financial issues to an audience and project management.

Annex VI: Details of Plans for Demonstrations and Replications

The successful implementation of the demonstration projects of HEM production is very essential to the achievement of PREMCI objectives.

In particular, the technical capacity development for local electric motor manufacturers (or enterprises) and the pilot REM producers that are currently being supported by the MIIT program on EMR will be coordinated to make use of the potential synergies. One of the major capacity development activities will be on the demonstration of the application of improved EE motor product design and manufacturing. This will involve the provision of technical assistance to selected electric motor manufacturers and pilot REM producers on the design and manufacturing of REMs, the prototype production of selected EE motor designs, including EE motor product testing. The results of the capacity development activities and demonstrations of the application of energy efficient EE motor designs and production will be published and disseminated to other local electric motor manufacturers.

The HEM/REM demonstration program will be guided by the business model development under the project which be based on the findings of the survey and analysis on China electric motor industry. The studies will include review and comparative analysis of existing business models on the profitability of EE motor manufacturing and application. A suitable business model on EE motor manufacturing and application will be identified and developed for subsequent piloting. A plan for implementing the demonstration projects for verifying the selected business models will be drafted and approved by responsible agency. The selected enterprises will introduce and host the demonstration of the application of the latest HEM and REM research results in collaboration with the research institutes and/or own R&D group of the enterprise. The effectiveness of business models will be tested through operating demonstration projects before they can be replicated and promoted in other provinces/cities to ensure sustainable profits for investors to support EE motor manufacturing and application. For the REM development, the project will showcase cost effectiveness of REM products based on a series of energy efficiency testing following the standard testing protocols that are likewise applied in HEMs. The development process looks forward to full commercialization of the HEM/REM production leading to the realization of the targeted HEM/REM production as shown below.

Demonstration and Replication Plan

	Year 1	Year 2	Year 3	Year 4
Demonstration and replication of improved EE motor product design and manufacturing				
Pilot Demonstration	3 electric motor manufacturing enterprises applying 3 selected HEM prototype designs			
Replication Projects		Demonstration in selected enterprises in 2 -3 provinces (Shandong, Anhui,	Demonstration in selected enterprises in 2 -3 provinces (Shandong, Anhui,	Commercialization
Target HEM Production/Sales, *MW*	10,000	30,000	60,000	102,100
Demonstration and replication projects of electric motor remanufacturing				
Pilot demonstration	3 electric motor manufacturing enterprises applying 3 selected REM prototype designs			

Replication Projects		Demonstration in selected enterprises in 2 -3 provinces (Shandong, Anhui, Hunan)	Demonstration in selected enterprises in 2 -3 provinces (Shandong, Anhui, Hunan)	Commercialization
Target REM Production/Sales, *MW*	1,000	2,000	3,000	4,000
Total Target HEM/REM Production/Sales, MW	11,000	32,000	63,000	106,100

Support Activities

1. Technical support and assistance in the identification and design of demonstrations for the promotion of the production and application of EE motors (HEMs and REMs) – Ministry of Science and Technology
2. Technical support and administrative assistance in capacity development and demonstration activities of the project in its pilot sites in cooperation with local governments - Dept. of Energy Conservation in Local Governments (MIIT EMR pilot sites)
3. Direct technical and administrative assistance for pilot demonstration and the capacity development activities of the staff involved under the project - Pilot Enterprises on the production of REMs
4. Active participation in stakeholder meetings and consultations in policy making, regulatory framework and various activities of the project and provision of information regarding research and demonstration work on EE motor manufacturing, particularly on HEMs and REMs - Electric motor industry association
5. REMs manufacturing demonstration and testing facility – Anhui, Shandong and Hunan Provincial Governments

The results and recommendations of the studies that will be available within the first year of implementation should guide the technical considerations, assumptions, baseline and target values for energy savings and GHG emission reduction, market impact, parties involved and other relevant information necessary for decision making. A detailed plan and timetable should be agreed on during the project inception.

In this activity, the initial 3 HEM manufacturers are to be selected as pilot enterprises based on qualification criteria that include for instance the willingness of the enterprises, experience in R&D and commercialization, technological level of their staff, types of electric motors produced in relation to the HEM prototypes selected. The outputs of this activity shall be monitored and evaluated. The results and experiences in the pilot demonstrations will be documented and shared in the project activities under Activity 2.1.3 involving dissemination information on improved EE motor product design and production to promote and encourage enterprises to go into of HEM production and increase HEMs in the market.

Depending on the duration of the research, development and demonstration (RD & D) process, successful demonstrations will be subsequently introduced in the market for commercialization. Because of the great market potential for HEMs, this process can be accelerated by the enterprises involved considering their business interest and preparedness. The enterprises will subsequently acquire production rights in the HEM prototypes and showcase the development process in finding ways to be a model to other enterprises in going into and expanding HEM production and ultimately increase the HEM market share and thereby lower the cost of each unit as the volume of HEMs produced and sold increase.

Annex VII: UNDP-GEF Environmental and Social Screening

Project Information

Project Information	
1. Project Title	**Promoting Energy Efficient Electric Motors in Chinese Industries (PREMCI)**
2. Project Number	00093919
3. Location (Global/Region/Country)	China

Part A. Integrating Overarching Principles to Strengthen Social and Environmental Sustainability

QUESTION 1: How Does the Project Integrate the Overarching Principles in order to Strengthen Social and Environmental Sustainability?
Briefly describe in the space below how the Project mainstreams the human-rights based approach
PREMCI is aligned to human-rights based approach because its goal of reducing greenhouse gases will ultimately enhance quality of life for all. The project will go through a rigid HEM/REM R&D and commercialization process that will involve relevant agencies to ensure that the best and appropriate business models of production and sustainable development will redound to social and environmental benefits to human beings.
Briefly describe in the space below how the Project is likely to improve gender equality and women's empowerment
PREMCI may not directly improve gender equality and women's empowerment but with the use of energy efficient motors widely in the homes, manufacturing industries and public places, women benefit from the project by the much reduced drudgery and monetary savings in performing tasks and chores. The project will benefit women or promote gender equity by allowing progress to be made in terms of health, education and poverty, giving women more chance of having opportunities traditionally reserved for men in the manufacturing industries. In this way, it contributes to improvements of living conditions of women.
Briefly describe in the space below how the Project mainstreams environmental sustainability
With the advocacy to develop the market in the use of energy efficient motors, the PREMCI Project will continue to save energy and reduce CO_2 for environmental sustainability. The project will mainstream the results of its HEM/REM R&D and commercialization by initially piloting HEM/REM production using energy efficient designs that will surely save energy and reduce GHG starting with 3 provinces in Shandong, Hunan and Anhui. Resulting from extensive studies done, this will serve as basis for more elaborate replication plans in other provinces and cities as they adopt the HEM/REM program in their local electric motor production and application in industries.

Part B. Identifying and Managing Social and Environmental Risks

QUESTION 2: What are the Potential Social and Environmental Risks? Note: Describe briefly potential social and environmental risks identified in Attachment 1 – Risk Screening Checklist (based on any "Yes" responses). If no risks have been identified in Attachment 1 then note "No Risks Identified" and skip to Question 4 and Select "Low Risk". Questions 5 and 6 not required for Low Risk Projects.	**QUESTION 3: What is the level of significance of the potential social and environmental risks?** *Note: Respond to Questions 4 and 5 below before proceeding to Question 6*			**QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?**
Risk Description	***Impact and Probability (1-5)***	***Significance (Low, Moderate, High)***	***Comments***	***Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.***
Very minimal risk identified. The current manufacturing process could have potential pollution from oven emissions and resin wastages but this will be addressed & managed by the project through cleaner production processes.	I = 2 P = 1	**Low**		The project will consider the application of new and advanced technologies for example for stator/wire binding such as the dip & spin, trickle and bondable wire methods, which reduce oven emissions and resin wastages compared to the most conventional method for bonding stators which is the resin dip tank.

	QUESTION 4: What is the overall Project risk categorization?		
	Select one (see SESP for guidance)		**Comments**
	Low Risk	☒	
	Moderate Risk	☐	
	High Risk	☐	

	QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are relevant?		
	Check all that apply		**Comments**
	Principle 1: Human Rights	☐	
	Principle 2: Gender Equality and Women's Empowerment	☐	
	1. Biodiversity Conservation and Natural Resource Management	☐	

	2. Climate Change Mitigation and Adaptation	☐	
	3. Community Health, Safety and Working Conditions	☐	
	4. Cultural Heritage	☐	
	5. Displacement and Resettlement	☐	
	6. Indigenous Peoples	☐	
	7. Pollution Prevention and Resource Efficiency	☑	The project will consider the application of new and advanced technologies for example for stator/wire binding such as the dip & spin, trickle and bondable wire methods, which reduce oven emissions and resin wastages compared to the most conventional method for bonding stators which is the resin dip tank. The demonstration component of the proposed project will be designed taking into consideration the need to prevent a potential for the release, in the environment, of hazardous materials resulting from their handling, storage and use for the demonstrations and replications that will be carried out under the project.

Final Sign Off

Signature	***Date***	***Description***
QA Assessor		UNDP staff member responsible for the Project, typically a UNDP Programme Officer. Final signature confirms they have "checked" to ensure that the SESP is adequately conducted.
QA Approver		UNDP senior manager, typically the UNDP Deputy Country Director (DCD), Country Director (CD), Deputy Resident Representative (DRR), or Resident Representative (RR). The QA Approver cannot also be the QA Assessor. Final signature confirms they have "cleared" the SESP prior to submittal to the PAC.
PAC Chair		UNDP chair of the PAC. In some cases PAC Chair may also be the QA Approver. Final signature confirms that the SESP was considered as part of the project appraisal and considered in recommendations of the PAC.

SESP Attachment 1. Social and Environmental Risk Screening Checklist

Checklist Potential Social and Environmental Risks		
Principles 1: Human Rights		**Answer (Yes/No)**
1.	Could the Project lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalized groups?	No
2.	Is there a likelihood that the Project would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups? [29]	No
3.	Could the Project potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups?	No
4.	Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalized groups, from fully participating in decisions that may affect them?	No
5.	Is there a risk that duty-bearers do not have the capacity to meet their obligations in the Project?	No
6.	Is there a risk that rights-holders do not have the capacity to claim their rights?	No
7.	Have local communities or individuals, given the opportunity, raised human rights concerns regarding the Project during the stakeholder engagement process?	No
8.	Is there a risk that the Project would exacerbate conflicts among and/or the risk of violence to project-affected communities and individuals?	No
Principle 2: Gender Equality and Women's Empowerment		
1.	Is there a likelihood that the proposed Project would have adverse impacts on gender equality and/or the situation of women and girls?	No
2.	Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	No
3.	Have women's groups/leaders raised gender equality concerns regarding the Project during the stakeholder engagement process and has this been included in the overall Project proposal and in the risk assessment?	No
4.	Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services? *For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well being*	No
Principle 3: Environmental Sustainability: Screening questions regarding environmental risks are encompassed by the specific Standard-related questions below		
Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management		
1.1	Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services? *For example, through habitat loss, conversion or degradation, fragmentation, hydrological changes*	No
1.2	Are any Project activities proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities?	No
1.3	Does the Project involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods? (Note: if restrictions and/or limitations of access to lands would apply, refer to Standard 5)	No
1.4	Would Project activities pose risks to endangered species?	No
1.5	Would the Project pose a risk of introducing invasive alien species?	No
1.6	Does the Project involve harvesting of natural forests, plantation development, or reforestation?	No
1.7	Does the Project involve the production and/or harvesting of fish populations or other aquatic species?	No
1.8	Does the Project involve significant extraction, diversion or containment of surface or ground water? E.g., *construction of dams, reservoirs, river basin developments, groundwater extraction*	No

[29] Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to "women and men" or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

1.9	Does the Project involve utilization of genetic resources? (e.g. collection and/or harvesting, commercial development)	No
1.10	Would the Project generate potential adverse trans-boundary or global environmental concerns?	No
1.11	Would the Project result in secondary or consequential development activities which could lead to adverse social and environmental effects, or would it generate cumulative impacts with other known existing or planned activities in the area? *For example, a new road through forested lands will generate direct environmental and social impacts (e.g. felling of trees, earthworks, potential relocation of inhabitants). The new road may also facilitate encroachment on lands by illegal settlers or generate unplanned commercial development along the route, potentially in sensitive areas. These are indirect, secondary, or induced impacts that need to be considered. Also, if similar developments in the same forested area are planned, then cumulative impacts of multiple activities (even if not part of the same Project) need to be considered.*	No
Standard 2: Climate Change Mitigation and Adaptation		
2.1	Will the proposed Project result in significant[30] greenhouse gas emissions or may exacerbate climate change?	No
2.2	Would the potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change?	No
2.3	Is the proposed Project likely to directly or indirectly increase social and environmental vulnerability to climate change now or in the future (also known as maladaptive practices)? *For example, changes to land use planning may encourage further development of floodplains, potentially increasing the population's vulnerability to climate change, specifically flooding*	No
Standard 3: Community Health, Safety and Working Conditions		
3.1	Would elements of Project construction, operation, or decommissioning pose potential safety risks to local communities?	No
3.2	Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?	No
3.3	Does the Project involve large-scale infrastructure development (e.g. dams, roads, buildings)?	No
3.4	Would failure of structural elements of the Project pose risks to communities? (e.g. collapse of buildings or infrastructure)	No
3.5	Would the proposed Project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, and erosion, flooding or extreme climatic conditions?	No
3.6	Would the Project result in potential increased health risks (e.g. from water-borne or other vector-borne diseases or communicable infections such as HIV/AIDS)?	No
3.7	Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning?	No
3.8	Does the Project involve support for employment or livelihoods that may fail to comply with national and international labor standards (i.e. principles and standards of ILO fundamental conventions)?	No
3.9	Does the Project engage security personnel that may pose a potential risk to health and safety of communities and/or individuals (e.g. due to a lack of adequate training or accountability)?	No
Standard 4: Cultural Heritage		
4.1	Will the proposed Project result in interventions that would potentially adversely impact sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: Projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	No
4.2	Does the Project propose utilizing tangible and/or intangible forms of cultural heritage for commercial or other purposes?	No
Standard 5: Displacement and Resettlement		
5.1	Would the Project potentially involve temporary or permanent and full or partial physical displacement?	No
5.2	Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	No
5.3	Is there a risk that the Project would lead to forced evictions?[31]	No

[30] In regards to CO_2, 'significant emissions' corresponds generally to more than 25,000 tons per year (from both direct and indirect sources). [The Guidance Note on Climate Change Mitigation and Adaptation provides additional information on GHG emissions.]

[31] Forced evictions include acts and/or omissions involving the coerced or involuntary displacement of individuals, groups, or communities from homes and/or lands and common property resources that were occupied or depended upon, thus eliminating the ability of an individual, group, or community to reside or work in a particular dwelling, residence, or location without the provision of, and access to, appropriate forms of legal or other protections.

5.4	Would the proposed Project possibly affect land tenure arrangements and/or community based property rights/customary rights to land, territories and/or resources?	No
Standard 6: Indigenous Peoples		
6.1	Are indigenous peoples present in the Project area (including Project area of influence)?	No
6.2	Is it likely that the Project or portions of the Project will be located on lands and territories claimed by indigenous peoples?	No
6.3	Would the proposed Project potentially affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples (regardless of whether indigenous peoples possess the legal titles to such areas, whether the Project is located within or outside of the lands and territories inhabited by the affected peoples, or whether the indigenous peoples are recognized as indigenous peoples by the country in question)? *If the answer to the screening question 6.3 is "yes" the potential risk impacts are considered potentially severe and/or critical and the Project would be categorized as either Moderate or High Risk.*	No
6.4	Has there been an absence of culturally appropriate consultations carried out with the objective of achieving FPIC on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned?	No
6.5	Does the proposed Project involve the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	No
6.6	Is there a potential for forced eviction or the whole or partial physical or economic displacement of indigenous peoples, including through access restrictions to lands, territories, and resources?	No
6.7	Would the Project adversely affect the development priorities of indigenous peoples as defined by them?	No
6.8	Would the Project potentially affect the physical and cultural survival of indigenous peoples?	No
6.9	Would the Project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	No
Standard 7: Pollution Prevention and Resource Efficiency		
7.1	Would the Project potentially result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or trans-boundary impacts?	Yes, but will be addressed in project
7.2	Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)?	Yes, but will be addressed in project
7.3	Will the proposed Project potentially involve the manufacture, trade, release, and/or use of hazardous chemicals and/or materials? Does the Project propose use of chemicals or materials subject to international bans or phase-outs? *For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Conventions on Persistent Organic Pollutants or the Montreal Protocol*	No
7.4	Will the proposed Project involve the application of pesticides that may have a negative effect on the environment or human health?	No
7.5	Does the Project include activities that require significant consumption of raw materials, energy, and/or water?	No