# Scientific and Technical Advisory Panel

The Scientific and Technical Advisory Panel, administered by UNEP, advises the Global Environment Facility
(Version 5)

## STAP Scientific and Technical screening of the Project Identification Form (PIF)

Date of screening: October 07, 2013 Screener: Nijavalli H. Ravindranath

Panel member validation by: Ralph E. Sims
Consultant(s):

**I. PIF Information** *(Copied from the PIF)*
**FULL SIZE PROJECT GEF TRUST FUND**
**GEF PROJECT ID**: 5360
**PROJECT DURATION** : 4
**COUNTRIES** : China
**PROJECT TITLE**: Promoting Energy Efficient Electric Motors in Chinese Industries
**GEF AGENCIES**: UNDP
**OTHER EXECUTING PARTNERS**: In China: Ministry of Industry and Information Technology (MIIT)
**GEF FOCAL AREA**: Climate Change

**II. STAP Advisory Response** *(see table below for explanation)*

Based on this PIF screening, STAP's advisory response to the GEF Secretariat and GEF Agency(ies): **Minor revision required**

**III. Further guidance from STAP**

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, harmonised, 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.

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.

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.

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.

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.

7. STAP recommends a focussed approach for energy efficiency motors rather than national efforts covering all industries at national level.

8. 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 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 labeling requirements so that motor purchasers worldwide have the ability to easily recognize premium efficiency products.

9. 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.
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Annex -

International Institute for Energy Conservation (IIEC)/International Copper Association (ICA) China Energy Efficiency Program: A project to promote high-efficiency motors in China by encouraging and providing technical assistance to the Chinese government to develop motor minimum efficiency standards, a premium-quality motor brand and a motor efficiency certification program. The program also provides information and training to manufacturers and end-users, identifies and explores financing mechanisms for energy efficiency investments, and facilitates demonstration projects.

Sino-U.S. Motor Systems Team: Developing and implementing pilot training programs and informational materials and tools on motor, pump, fan and compressed air systems in order to lay the groundwork for a nationwide China motor systems program Principal participants include the Chinese State Development Planning Commission (SDPC), U.S. DOE, and the China Energy Conservation Investment Corporation (CECIC).

Technology Cooperation Agreement Pilot Project: A U.S. EPA-funded effort to
demonstrate technology cooperation as called for in the Framework Convention on Climate Change. One of the initial target areas is motor systems, with a particular focus on the introduction and increased awareness of new technologies.

China State Economic and Trade Commission/China Energy Conservation
Association/Energy Foundation: A multi-year effort focused on policies for improving industrial-sector efficiency; the effort will address establishing national energy use guidelines in selected industrial sectors. One of the areas under consideration for meeting these new guidelines is increased efficiency in industrial motor systems.

GTZ/China Electric Power Research Institute motor test laboratory and test procedure project: Funded by the German government, this project is working on establishing revised motor efficiency standards in China and establishing a new motor efficiency test laboratory; this effort is coordinated with the IIEC effort discussed above.

World Bank/Global Environment Facility (GEF) Energy Management Company Project: A multiyear project to help establish multiple energy management companies (EMC's) in China; so far three EMC's have been formed and more are planned. Motor systems are a significant area of focus for these EMC's.

China Energy Conservation Information Dissemination Center: Prepares case studies and good practice manuals on energy-saving measures; some of the case studies are on motor systems. The first manual published is on VSDs.

United Nations Industrial Development Organization: Many program on industrial motors programs.

A. China Motor System Energy Conservation Program
People's Republic of China
The developmental objective of the project was to assist the Chinese Government in controlling the growth of greenhouse gas emissions by establishing a national program to promote motor system improvements in factories throughout the country.

B. China Motor-Systems Energy Conservation Programme
Location: China
Project description: The developmental objective of the project was to assist the Chinese Government in controlling the growth of greenhouse gas emissions by establishing a national programme to promote motor system improvements in factories throughout the country.

C. New PPP on Energy Efficiency Indicators for Motor Systems Efficiency
Publication Date: November 1, 2012

The United Nations Industrial Development Organisation (UNIDO) and The Global Green Growth Institute (GGGI) have launched a new Public-Private Partnership (PPP) on motor-systems efficiency indicators at a 3GF Forum session that took place in Copenhagen on October 9, 2012. The development of such indicators will help decision-makers and industry in rapid deployment of industrial energy efficiency policies and measures. The participants of the PPP session widely acknowledged the considerable opportunities that exist in the industrial sector to achieve up to 30% energy efficiency gains in motor-driven systems.

The China Motor Systems Energy Conservation Program: Establishing the Foundation for Systems Energy Efficiency Aimee McKane, Zou Guijin, Robert Williams, Steven Nadel, Vestal Tutterow A book published by Springer.

| *STAP advisory response* | *Brief explanation of advisory response and action proposed* |
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| **1. Consent** | STAP acknowledges that on scientific or technical grounds the concept has merit. However, STAP may state its views on the concept emphasizing any issues where the project could be improved.<br><br>Follow up: The GEF Agency is invited to approach STAP for advice during the development of the project prior to submission of the final document for CEO endorsement. |
| **2. Minor revision required.** | STAP has identified specific scientific or technical challenges, omissions or opportunities that should be addressed by the project proponents during project development.<br><br>Follow up: One or more options are open to STAP and the GEF Agency:<br>(i) GEF Agency should discuss the issues with STAP to clarify them and possible solutions.<br>(ii) In its request for CEO endorsement, the GEF Agency will report on actions taken in response to STAP's recommended actions. |
| **3. Major revision required** | STAP has identified significant scientific or technical challenges or omissions in the PIF and recommends significant improvements to project design.<br><br>Follow-up:<br>(i) The Agency should request that the project undergo a STAP review prior to CEO endorsement, at a point in time when the particular scientific or technical issue is sufficiently developed to be reviewed, or as agreed between the Agency and STAP.<br>(ii) In its request for CEO endorsement, the Agency will report on actions taken in response to STAP concerns. |