

# OFFICE MEMORANDUM

DATE: October 1, 2001

TO: Mr. Ken King, Assistant CEO, GEF Secretariat  
Attention: GEF PROGRAM COORDINATION

FROM: Lars Vidaeus, GEF Executive Coordinator



EXTENSION: 3-4188

SUBJECT: **China: GEF Energy Conservation Project, Phase II  
Submission for Work Program Inclusion**

Please find enclosed the electronic attachment of the above mentioned project brief for work program inclusion. We would appreciate receiving any comments by October 9, 2001.

The proposal is consistent with the *Criteria for Review of GEF Projects* as presented in the following sections of the project brief:

- **Country Driven-ness:** The proposed Phase II project has been designed by the State Economic and Trade Commission's (SETC) Project Management Office (PMO) and its advisors, together with the Bank project team, to help overcome identified barriers to rapid development of China's EMC industry as efficiently as possible (Section B3). The project is a central element of the Government's plan to increasingly rely upon market-based initiatives to improve energy efficiency. SETC will be responsible for coordination of project implementation, working together with the Ministry of Finance and other agencies and research units. Its PMO, established in 1997, has been effectively conducting project coordination activities for the first phase of the China Energy Conservation Project, and will continue its work during this second phase (Section C4).
- **Endorsement:** The project is strongly supported by the Chinese Government. The GEF Operational Focal Point endorsement is anticipated in the next few days (the October 1-7 national holiday has caused an unexpected delay in receipt of the formal endorsement).
- **Program Designation & Conformity:** The project is consistent with the objectives of GEF Operational Program #5: removal of barriers to energy efficiency and energy conservation. The EMC concept has been successfully demonstrated under Chinese conditions by three large pilot EMCs established in 1997 and developed under the ongoing EC/GEF/IBRD China Energy Conservation Project. Other EMCs are now

- endeavoring to emerge, and interest in developing this type of business in China is running high. Fostering the broad development of an EMC industry in China quickly requires: (a) the introduction and growing participation of China's domestic banks in the business, as the primary source of credit, and (b) massive dissemination of the concept and experiences achieved, supported also with practical technical assistance and operationally-focused training for emerging new EMCs. This project seeks to meet these requirements (Section A1 and B1).
- **Project Design:** The rationale for and strategic choices made in the project's design are explained in Section B3 and its design is summarized in Section C1. The proposed project includes two components: (a) an EMC Service Component, designed primarily to provide in-depth, practical technical assistance to new and emerging EMCs on the setting up and development of their businesses, and (b) an EMC Loan Guarantee Program, designed to provide new and emerging EMCs with enhanced opportunities to receive loans from domestic banks, and to engage the banks in the development of a sustainable EMC industry (Section C1). Experience in other Bank/GEF projects, and in a variety of countries, in promoting EMCs/ESCOs has been fully incorporated in the project design, particularly through active involvement of the task team in the Bank's Energy Efficiency and Environment Thematic Group. Contingent finance arrangements developed in IFC's Hungary Energy Efficiency Guarantee Project and the proposed GEF Romania Energy Efficiency Project were closely reviewed, and elements from these projects have been incorporated in the project design (Section D3).
  - **Sustainability:** The development of a self-sustaining (and growing) EMC industry in China is the objective of this project. The project has been designed specifically to achieve this objective, by aiming to involve domestic banks as the financiers of the industry, thus completing the full necessary market framework, and by developing a service-oriented EMC Group/Association for mutual EMC assistance (Section F1).
  - **Replicability:** This project seeks to replicate the EMC business model successfully implemented by the three demonstration EMCs in the first phase of the project, and to further adapt and adjust this model to meet different corporate and project conditions through a number of associated, but slightly different models. The project aims to replicate the existing and new and emerging EMC models on a broad scale across China (Section F2).
  - **Stakeholder Involvement:** Project design has included consultations with a wide range of stakeholders, in the central and local government, research, NGO, industrial, commercial and financial sectors (Section E6).
  - **Monitoring & Evaluation:** Financial management monitoring for this project will be especially stringent (Section E4). The project includes a major subcomponent to monitor and evaluate its performance and results, especially in terms of energy savings and carbon reduction actually achieved (Annexes 3 and 4).
  - **Financing Plan:** GEF co-financing of \$26 million is proposed for this project. Most of its costs will be funded from private sources (Section C1).

- Cost-effectiveness: The project will achieve large and very cost-effective reductions in energy use, GHG emissions and other pollutants. Because: (a) the project builds upon the investments made in the first phase of the GEF China Energy Conservation Project; (b) GEF contingent financing is employed; and (c) the Chinese energy efficiency market is so large, the cost effectiveness of the GEF's projected net investment in the project is extremely high, at some 12-24 US cents/ton of carbon avoided (Section C3, Annex 4).
- Core Commitments and Linkages: This project conforms fully with the CAS goals to adjust the balance between energy development and conservation and improve the environmental sustainability of infrastructure (Section B1).
- Consultation, Coordination and Collaboration between IAs: The China Energy Conservation Project is well known in the international donor community, and several bilateral donors have provided associated assistance. The overall project, and the Phase II design concept, have been discussed a number of times with UNDP staff, especially in the UNDP country office.
- Response to Reviews: At pipeline entry GEFSEC reminded the team to include reference to events or information requested by the GEF Council when the first phase was approved (Section D3, with information provided in Annexes 2 and 6). GEFSEC also encouraged the Bank and Chinese teams to maintain flexibility in the project design, in order to best accommodate events as they evolved during project implementation, which has also been done. The Bank team's response to the STAP Reviewer's comments are provided in Annex 5.

Please let me know if you require any additional information to complete your review prior to inclusion in the work program. Many thanks.

**Distribution:**

**Messrs.:** E Torres, UNDP  
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cc: Messrs./Mmes. Farhandi, Taylor, Ogawa, Velilla (EASEG); Broadfield (EASES); Khanna, Johnson, Aryal (ENV); ENVGC ISC; Regional Files.

## PROJECT BRIEF

### 1. IDENTIFIERS:

<b>PROJECT NUMBER</b>	P067337
<b>PROJECT Name</b>	<b>China: Energy Conservation Project, Phase II</b>
<b>DURATION</b>	7 years
<b>IMPLEMENTING AGENCY</b>	World Bank
<b>EXECUTING AGENCY</b>	Ministry of Finance, State Economic and Trade Commission
<b>REQUESTING COUNTRY OR COUNTRIES</b>	China
<b>ELIGIBILITY</b>	China ratified FCCC on January 5, 1993
<b>GEF FOCAL AREA</b>	Climate Change
<b>GEF PROGRAMMING FRAMEWORK</b>	OP 5

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### 2. SUMMARY:

The objective of this proposed Phase II of the China Energy Conservation Project is to expand domestic investment in energy efficiency projects through the aggressive development of China's nascent Energy Management Company (EMC) industry, thereby achieving large-scale energy efficiency improvements and associated reduction in the growth of carbon dioxide emissions. Patterned in many ways after ESCOs operating abroad, three large EMCs were successfully developed in China during the first phase of the China Energy Conservation Project. As of May 2001, the first three EMCs had successfully undertaken 173 energy performance contracting projects, with an aggregate investment of about US\$34 million, and they are continuing to grow profitably. The proposed Phase II seeks to build upon this past success, to expand China's EMC industry into a major energy efficiency investment modality, operating under purely market conditions with loan finance from domestic banks.

The project includes two components: (a) an EMC Service Component, designed primarily to provide in-depth, practical technical assistance to new and emerging EMCs on the establishment and development of their businesses; and (b) an EMC Loan Guarantee Program, designed to provide new and emerging EMCs with enhanced opportunities to receive loans from domestic banks, and to engage the banks in the development of a sustainable EMC industry. This project will provide no direct grants to EMCs end-user. Instead, the bulk of the GEF financing will be used in a contingent grant financing mode for a self-sustaining capital reserve to back-stop the Guarantee Program. Accordingly, the GEF funds will achieve an exceptionally high leveraging of commercial investment capital. As a second phase operation designed to reap the benefits of the initial demonstration operation, and a project designed for maximum leveraging of GEF resources through contingent financing, the project may achieve cost-effectiveness ratios of just 12-24 US cents of net GEF grant financing per ton of carbon emission reduction.

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### 3. COSTS AND FINANCING (MILLION US\$):

<b>Global Environment Facility</b>	26.0
Guarantee Company Shareholders	3.7
Commercial Banks and EMCs	250.0
EMC Association Members	1.5
<b>Total Phase II Cost &amp; Financing</b>	<b>281.2</b>

Associated Costs & Financing:

United Kingdom DfID (2001)	2.5
European Commission (1996)	4.5
China Energy Conservation Project (1998):	
GEF	22.0
IBRD	63.0
SETC	7.0
Domestic Loans	30.9
EMC Internal Sources	23.4

**Total Associated Financing   153.3**

**4. OPERATIONAL FOCAL POINT ENDORSEMENT:**

**Name:** Zhang Wencai                      **Title:** Director, Division II, International Department

**Organization:** Ministry of Finance      **Date:** October 15, 2001

**5. IA CONTACTS:**

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## **A: PROJECT DEVELOPMENT OBJECTIVE**

### **1. Project development objective**

(see Annex 1)

The objective of the proposed project is to expand domestic investment in energy efficiency projects through the aggressive development of China's nascent Energy Management Company (EMC) industry, thereby achieving large-scale energy efficiency improvements and associated reductions in the growth of carbon dioxide emissions and other pollutants. The EMC concept has been successfully demonstrated under Chinese conditions by three large pilot EMCs established in 1997 and developed under the ongoing EC/GEF/IBRD China Energy Conservation Project. Other EMCs are now endeavoring to emerge, and interest in developing this type of business in China is running high. To foster the broad development of an EMC industry in China quickly will require (a) the introduction and growing participation of China's domestic banks in the business, as the primary source of credit, and (b) massive dissemination of the concept and experiences achieved, supported also with practical technical assistance and operationally-focused training for emerging new EMCs. This project seeks to meet these requirements.

EMCs in the Chinese context are similar to energy service companies (ESCOs) operating abroad. The EMCs undertake energy conservation investment project in other "host" enterprises, based on a contract between the EMCs and hosts (e.g., an "energy performance contract"). As developed in the three pilot EMCs, the EMCs are responsible for project design, procurement, installation, financing and energy conservation performance. Host enterprises are obligated to pay the EMC a portion of the energy savings realized (typically about 80%) over the tenor of the contract (typically 1-3 years), as payment for the project package. At the end of the contract, title to the relevant equipment, and all future energy savings arising there from revert to the host enterprise. The emerging Chinese EMCs need not strictly adhere to the model developed by the first three pilot companies. Variations in terms of EMC corporate structure, business lines, contractual arrangements, and role of the EMC in project financing are expected, and healthy. To be defined as an EMC in the Chinese context, the two critical points are: (a) over 50% of the benefits of EMC projects should arise from energy savings, in order to be classified as energy conservation projects, and (ii) the revenue paid to EMCs by host enterprises should be derived from and be proportional to actual reductions in energy costs, allowing the host enterprise to maintain positive cash flow on the project throughout the project life.

### **2. Key Performance Indicators**

(see Annex 1)

The key performance indicators for this project will include (i) total energy saved, and abatement of associated carbon dioxide emissions, resulting from increased energy efficiency investments by China's emerging EMC industry, and (ii) various indicators of the breadth, depth and rate of the development of China's EMC industry. Draft performance indicators will be prepared and discussed at Project Appraisal, and formally agreed at Project Negotiations.

## **B: STRATEGIC CONTEXT**

### **1a. Sector-related Country Assistance Strategy (CAS) goal supported by the project**

(see Annex 1):

Document number: R98-107

Date of latest CAS discussion: 05/28/98

The 1998 CAS goals were to reduce infrastructure bottlenecks by adjusting the investment pattern in favor of water management, energy, transportation, and telecommunications, to adjust the balance between energy development and conservation, and to develop alternative energy sources. The CAS is currently under revision and major themes emerging are assistance to China in its transitions from a command economy to a market economy; and from a rural, agricultural economy to an urban society, focusing on development of the institutional frameworks, development of environmentally sustainable infrastructure; and addressing the needs of disadvantaged peoples and regions.

This project conforms fully with the program's goals to adjust the balance between energy development and conservation and improve the environmental sustainability of infrastructure.

### **1b. Global Operational Strategy/Program Objective addressed by the Project**

The project is consistent with the objectives of GEF Operational Program 5: Removal of Barriers to Energy Efficiency and Energy Conservation. Section 5.7 of OP5 includes support for activities that lead to sustainable “win-win” results that demonstrate local, national, and global benefits through removal of these barriers.

## **2. Main sector issues and Government strategy**

**Energy Conservation Efforts in China.** Improving energy efficiency has been a cornerstone in China's energy policy for about 20 years. It has long been recognized that continued, long-term economic growth is not physically, financially or environmentally sustainable without dramatic further improvements in energy efficiency. Initially, the Chinese Government employed a series of monitoring and quota mechanisms through the planned economy to promote energy conservation and curtail at least the most blatant cases of energy waste. More recently, the Government has deployed a variety of tools, better suited to the developing market economy, which are similar to those employed in most market economies with sophisticated energy conservation policies. These include:

**The economic framework.** Reformed for many reasons, the current economic operating framework of most enterprises is far more conducive to improving energy efficiency than previously. Average energy price levels have been basically in line with, or above, production costs for a considerable period, and the financial energy costs faced by enterprises are generally close to economic costs. Although further reforms remain necessary, profit motives among enterprises have greatly increased, including in state-owned enterprises, and will increase further with China's accession to the World Trade Organization.

**Regulation.** Aided by the passage of an Energy Conservation Law in 1998, the Government is endeavoring to develop and implement various efficiency standards and labeling programs for energy-intensive equipment, codes for new buildings, and some unit energy consumption benchmarks for new industrial plant.

**Technology development.** Various programs are in place to foster the research and development and/or technology transfer from abroad of new, more energy-efficient technologies for a wide range of applications.

**Market-based initiatives.** Beginning in the early 1990s, China has increasingly tried to capitalize on market forces and incentives to encourage greater energy efficiency, through development of new investment mechanisms, efforts to increase business awareness, and institution building.

China has collaborated with a variety of international organizations on each of these initiatives with a number of important and worthwhile projects. For its part, the Bank has supported the technology transfer agenda, through the development of more energy-efficient small coal-fired boiler models under the GEF-supported China Efficient Industrial Boilers Project. The Bank also is considering possible support for the implementation of building energy efficiency regulations, as part of a possible future

Building Energy Efficiency and Heat Reform Project. However, the main focus of the Bank's effort, based on the findings of substantial upstream sector work, and following the strong desire of Government counterparts, has been to help develop means to better take advantage of market forces to implement financially attractive energy saving renovation projects. The effort to obtain results using market forces follows the slogan coined by one Chinese counterpart, "Conserve energy and make money." (See China: Energy Conservation Study, February 4, 1993), and China: Issues and Options in Greenhouse Gas Emissions Control, 1994).

The sector work mentioned directly above, together with other market analyses and many experiences in project implementation, including many case studies undertaken by SETC's Energy Conservation Information Dissemination Center (SECIDC), all have shown that there is very large potential across China for "classic" energy conservation renovation projects which yield sound life-cycle financial returns today. ("Classic" energy conservation projects may be defined as projects where the primary purposes is energy conservation. Major industrial restructuring and modernization projects also may save large amounts of energy, and are important in the national energy conservation program, but investment decision-making must involve more complex issues, such as long-term enterprise viability, market strategies, etc.). Investment scale for the classic energy conservation projects in industrial or commercial establishments typically range from US\$50,000-1,000,000, with financial rates of return of 20-40% p.a. or even more, and payback periods ranging generally between 1 and 4 years. However, a large part of this potential remains untouched. The reasons for this paradox, also found in other countries, include:

**Inadequate information.** Enterprises and individuals generally lack information about energy-saving investments, especially on financial aspects and the implementation experiences of others. Information of new and emerging technologies and project concepts is particularly difficult for many to obtain.

**Real or perceived insignificance of small projects.** Many worthwhile energy conservation investments are relatively small (although the high number of such projects in many enterprises makes aggregate potential rewards large). Although they may yield very attractive internal rates of return as projects, the end result may represent only a percentage point or two savings on total enterprise operating costs, or even less. Particularly if there are some other perceived headaches (lack of detailed information, insufficient financing, possible technical risk or operational disruption, etc.) this often results in unenthusiastic responses from enterprise managers.

**High transaction costs.** If a given enterprise has no experience with a certain type of energy conservation investment, the time required from skilled staff for securing information, analyzing design options, arranging financing, identifying reliable suppliers, etc., may make a small project not worthwhile.

**Risk.** Unless clearly demonstrated otherwise, fears that a new technology may not work, could interrupt production, or may take time to perfect, all inhibit enterprise managers from adopting new energy-saving technologies.

**Technology transfer barriers.** In some cases, it may be difficult for enterprises to gain access to state-of-the-art technologies.

**Difficulties in arranging financing.** High loan transaction costs for such types of small projects make commercial lending for many energy conservation projects unattractive to most banks, unless projects can be bundled together, or other pooling measures are adopted. Additional problems for banks may include lack of knowledge about the main technical areas and associated risk factors, reticence to lend for projects where projected operating cost benefits form the main revenue stream and which cannot readily be isolated, or less-than-average collateral values for the diverse, small-sized equipment generally associated with an energy conservation project. With such problems, most enterprises put other projects at the top of their lists when requesting bank loans.

The China Energy Conservation Project, and this proposed Phase II follow-on effort, are targeted squarely on the development and implementation of solutions to at least partially overcome these barriers to implementation of financially attractive energy conservation investment.

**The EC/GEF/IBRD China Energy Conservation Project.** Approved by the Bank's Board in March, 1998, the objective of the \$151 million China Energy Conservation Project is to achieve large, sustained and growing increases in energy efficiency, and associated reductions in growth of carbon dioxide emissions and other pollutants, by (a) introducing, demonstrating and disseminating new project financing concepts and market-oriented institutions to promote and implement energy efficiency measures in China, and (b) developing a more efficient national energy conservation information dissemination program. The project is designed to assist in the transition of China's energy conservation activities from a system based on planned economy concepts to a more market-oriented system, which can be sustained over time and grow with China's economy. The largest component of the project, including financing of \$15 million from the GEF, \$63 million from IBRD, \$4.5 million from the EC, and \$ 54.3 million from domestic sources, supports the establishment and pilot demonstration of EMCs in China for the first time. The project includes an \$10 million Information Component, which seeks to strengthen China's national efforts to improve access to specific information concerning successful domestic energy efficiency experience, geared in particular to financial decision makers, through the establishment and operation of SETC's new Energy Conservation Information Dissemination Center. The project also includes a \$4 million Project Management and Monitoring Component. (See the Project Appraisal Document, IBRD Report 17030-CHA, February 26, 1998).

Energy performance contracting as practiced by the three EMCs under the project (see section A1 above), can overcome many of the constraints described previously. By providing design, procurement, financing, and installation services, and guaranteeing positive-cash flow performance as a condition for any payment, the EMCs can overcome many of the problems faced by enterprises with energy conservation projects. If projects are successful, host enterprises basically receive new, more efficient equipment at the end of the performance contract, paid for entirely through energy savings. Through specialization, and replication of similar projects across many enterprises, the EMCs are able to reduce transaction costs. Because the internal economics of the projects are strong, there are sufficient financial returns to both attract host enterprises and provide strong financial returns to the EMCs.

Successfully developed in North America and Europe, groups in many developing countries have found the energy performance contracting concept appealing, and made efforts to develop ESCOs. However, it has proven difficult to ramp-up the scale of this approach and attain meaningful levels of investment, as it is a new and relatively sophisticated business, requiring a receptive operating environment and suitable mix of technical, financial risk management, procurement, contracting and marketing skills. In the Chinese case, where it was a totally new concept, it was decided therefore, to put maximum effort initially on the development of corporate working models of meaningful scale, to pioneer the mechanism, and test and adapt it in the Chinese market. If successful, yielding good financial results, the experiment could then be more broadly disseminated.

Project implementation to date has been fully satisfactory, and the three EMCs, founded in Beijing, Liaoning and Shandong, are successfully developing this segment of the market, building human capital and progressively growing their businesses. Formed in 1997 with shareholders' capital of between RMB 20-34 million each (US\$ 2.4-4.1 million), and recipients of a large-scale technical assistance program, the three small companies utilized an EC grant to implement initial sets of pilot subprojects in 1998. In mid-1999, the companies began to develop their portfolios, using GEF, IBRD and other financial resources. As of May 2001, the three EMCs have entered into 173 energy performance contracts with aggregate investment of about US\$ 34 million (including GEF financing of \$7 million). Their businesses are growing rapidly: in the year 2001 alone, the three companies plan to implement 54 new projects, totaling US\$17 million. Average annual financial rates of return to the EMCs of subprojects have been in excess of 20% per year, although these may decline somewhat in the future as their markets mature. Repayment by client enterprises has been very good, and with few exceptions, payments have been made according to

contracts. Profits from earlier investments are beginning to be realized: Liaoning and Shandong EMCs both made profits in 2000, and Beijing EMC is expected to follow suit shortly. Additional information of the experience of the three EMCs is provided in Annex 2.

Following publicity by SETC of the efforts so far, some new EMCs are beginning to form, and more groups and business are becoming interested in exploiting some of the potential for energy performance contracting.

### **3. Sector issues to be addressed by the project and strategic choices**

(see also Annex 2)

Now is the appropriate time to harvest the investments made in the demonstration EMCs and to begin a larger scale program to develop the EMC industry in China, based on these successful working models. All parties recognized during the design and preparation of the China Energy Conservation Project that the initial development of the pilot EMCs would need to be followed by a major dissemination and expansion effort, under a Phase II GEF project, in order for the full benefits and vision of the program to be truly realized. Provisions for this are reflected in the original Project Appraisal Document, legal agreements and Minutes of Project Negotiations. Originally, Phase II activities were included in a large first project package, but at project appraisal it was decided to split components for which GEF financing was sought, so that the detailed design of Phase II could build upon the initial implementation experience of the first three EMCs, and be best catered to evolving needs. It was agreed between the Bank and the Government that the follow-up GEF support would be sought about 18 months after the effectiveness of the first project.

Through the demonstration effort, the main achievements in developing EMCs to date include:

The concept of energy performance contracting has been shown to be viable under Chinese conditions. Promotion of this market mechanism has now become an important part of the Government's overall energy conservation policy.

The three EMCs have successfully pioneered corporate models and business strategies incorporating both the financial and technical sides of the energy performance contracting business.

Contract models, standard financing terms and benefit sharing regimes, energy savings verification methods, host enterprise selection criteria and credit controls, and project negotiation and management methods all have been worked out, tested and revised in over 70 projects, to best meet the practical needs in the Chinese economic system.

Market demand for energy performance contracting services has been demonstrated to be strong and broadly based across a variety of sectors, especially if the EMCs are able to provide project financing.

The three working models have attracted the attention of others. As of July 2001, some 6-8 small new EMCs had been formed, with registered capital of under RMB 5 million each (\$600,000). An additional 10-15 groups have established some types of subsidiaries to operate EMC-type businesses. Over 90 firms have expressed formal interest to SETC in establishing EMC-type businesses. However, most new initiatives remain small, and, while many groups have tried out some small energy performance contracting projects, little investment has actually been made (see also Annex 2).

Following surveys and many discussions with emerging/prospective EMCs and banking institutions, SETC's Project Management Office (PMO) and the Bank project team have concluded that the main barriers constraining rapid new EMC development today include:

*Lack of awareness of the basic concept.* Despite the steady efforts of SETC to publicize the concept of energy performance contracting, the idea remains basically unknown by most groups, except for some of

those specialized solely on energy conservation work. Given the vastness of China, truly massive efforts are required to raise awareness.

*Lack of knowledge and skills to operate EMC businesses.* Energy performance contracting, as operated by the EMCs to date, is both a novel and sophisticated business concept. Key capacities required include (a) excellent and up-to-date knowledge of energy conservation technologies and their practical application, in order to provide value-added to customers and minimize technical risks; (b) ability to assess and minimize host enterprise credit risks, employing various credit appraisal techniques and a variety of options to secure repayment prospects; (c) sophisticated corporate financial management, including project portfolio risk management; and (d) contract, procurement and project implementation management. Mixtures of these skills can in principle be gained through business alliances, well conceived staffing policies and extensive training, but practical knowledge from past experience is critical. There is rich experience in the range of business issues among the three EMCs and ESCOs abroad, but transfer of this knowledge and experience is a daunting task.

*Lack of credit financing for EMC business development.* Although policies may change in the future, all banks in China remain subject to interest rate regulation, which allows only minor variations in rates and hence does not enable loan pricing based on risk. Thus, since returns are largely fixed, Chinese commercial banks focus primarily on loan security issues and are particularly risk adverse. While a number of banks have noted the potential advantage of the EMC businesses in bundling projects together, and minimizing transaction costs, loans for energy performance contracting, either directly to host enterprises or EMCs, are perceived as being very risky. This is due to the lack of widespread experience with the mechanism, lack of established track records within prospective new EMCs, and difficulties in structuring the type of strong collateral and/or guarantee arrangements typically required by Chinese lenders. Liaoning EMC (one of the pilot EMCs) has successfully pioneered a strategic partnership and line-of-credit arrangement with a Chinese commercial bank, but only after demonstrating a track record of successful subprojects, strong management, a viable business plan, and with the benefit of GEF and IBRD financial commitments already in place.

*Difficulties in securing sufficient equity financing.* Equity financing is especially important if EMCs are to provide at least some financing for their projects. Securing equity investment also is often subject to the problems noted above, and is often a chicken-and-egg problem with respect to credit financing: If credit financing can be secured, equity investments are easier to obtain, and visa versa.

The proposed Phase II project has been designed by SETC's PMO and its advisors, together with the Bank project team, to help overcome these barriers to rapid development of China's EMC industry as efficiently as possible. Furthermore, in order to foster development of an EMC industry which is sustainable in the market on commercial terms, two additional objectives were set as requirements for project design: (a) direct grants to new or emerging EMCs should be avoided, and (b) the Chinese banking industry must be engaged as the key source of credit financing, replacing the donor financing in the demonstration phase. Indeed, the active participation of the banking sector is the remaining key piece of the market framework needed for operation of a sustainable EMC industry, as the third necessary player in this triangular business, joining the EMCs and host enterprises.

## **C: PROJECT DESCRIPTION SUMMARY**

### **1. Project Components**

(see Annex 3):

<b>Component</b>	<b>Indicative Costs (US\$M)</b>	<b>% of Total</b>	<b>Bank financing (US\$M)</b>	<b>% of Bank financing</b>	<b>GEF financing (US\$M)</b>	<b>% of GEF financing</b>

EMC Loan Guarantee Program	277.7	98.8	0.00	0.0	24.00	92.3
EMC Services	3.5	1.2	0.00	0.0	2.00	7.7
Total Project Costs	281.2	100.0	0.00	0.0	26.00	100.0
Total Financing Required	281.2	100.0	0.00	0.0	26.00	100.0

The proposed project includes two components: (a) an EMC Service Component, designed primarily to provide in-depth, practical technical assistance to new and emerging EMCs on the setting up and development of their businesses, and (b) an EMC Loan Guarantee Program, designed to provide new and emerging EMCs with enhance opportunities to receive loans from domestic banks, and to engage the banks in the development of a sustainable EMC industry.

**EMC Service Component.** This component will support the development and key initial activities of an EMC Service Group, which will operate as a Western-style trade association to provide a range of services to member EMCs or prospective member EMCs. The objective of the EMC Service Group is to assist in the creation of a sustainable EMC industry in China, by providing technical assistance and training services to emerging EMCs, promoting the EMC business in society at large, and developing a cohesive, mutually supporting network among member EMCs. A core EMC Service Group has already been formed, and begun operations. Financing for this activity includes: (a) a grant of about \$2.5 million from the United Kingdom's Department for International Development (DfID), which has already been approved and is under implementation through the Bank's Asia Alternative Energy Program (ASTAE); (b) proposed \$2.0 million in grant funds from the GEF, to provide continued support for the Group's capacity building efforts; and (c) about \$1.5 million in contributions from EMC members and other supporting groups, to support the operation of the Group/Association.

*The ASTAE-DfID EMC Service Activities.* Approved in March 2001, and launched in May 2001, the ASTAE-DfID project is being implemented over about two years. Initial major activities include: (a) development and initial delivery of a massive and sophisticated training program for new EMCs, including an introductory course, and advanced, interactive workshops on EMC corporate development and business strategy, EMC project development and management, EMC financial management, and new and emerging business opportunities; and (b) definition of the optimal long-term institutional arrangement for the EMC Service Group, based in part on the operational experiences of ESCO Associations internationally. Additional activities are planned on raising awareness among banks, and support for partnering of different potential shareholders (including foreign companies) in prospective new EMCs. The ASTAE-DfID project plays a critical role in the overall project, as it provides for a large-scale effort on corporate and business plan development for new EMCs prior to the initiation of the proposed loan guarantee program, which must await GEF Phase II project start-up.

*Proposed GEF-financed aspects.* GEF support over a five-year period is requested to follow-on from the ASTAE-DfID activities, and to build the EMC Service Group/Association into a self-sustaining and permanent association, publicly acknowledged as the central institution representing and servicing the national EMC industry in China. In addition to a further deepening of the Group's massive training programs, major efforts are required to develop the Group's advocacy functions on Government policies to support the EMC industry, international liaison, and development of sophisticated membership coordination, networking, and customized support functions. Also critical, this component will include a subcomponent of about \$600,000 of GEF support for monitoring, surveying, evaluating and reporting on the overall project performance and results.

**EMC Loan Guarantee Program.** A new EMC loan guarantee facility will be established under the project in China and operated on a commercial basis with national coverage, to enhance the ability of EMCs to obtain commercial loan financing from domestic banks. The facility will be operated by a Guarantee Company (either a new or existing company), working in strategic partnership with several major participating domestic banks, who will receive substantial technical assistance under the project. The Guarantee Company will offer partial credit guarantees of up to 80% of loan amounts. Guarantee periods are expected to range between 1-3 years, and amounts are expected to be relatively small. Hence, guarantee commitments will “revolve” fairly quickly. The guarantee facility must be operated on commercial terms, seeking to preserve and grow its capital base by controlling costs, pricing risk correctly, charging appropriate fees, and maintaining prudent treasury management. As the concept of commercially based loan guarantee companies is relatively new in China, the company will need to review and adapt lessons from abroad on its business approach, management structure and operation.

EMCs are expected to develop their own businesses, independently, using service from the EMC Service Group where necessary. For loan financing, they should approach domestic banks. If there is a need for some support to close a loan or line-of-credit, EMCs and the relevant bank may apply to the Guarantee Company for a partial guarantee. Application to participating bank, who will have a business unit familiar with the business and program, may be easiest, but not required. Working with the banks, the Guarantee Company will assess the application, reviewing the strength of existing direct business relationships, clients’ business plans, specific project, and/or collateral values or partial counter-guarantees, etc. Guarantees may be for loans directly to EMCs, EMC host enterprises, or various combinations of these.

The preliminary financing plan for the Guarantee Company includes: (a) shareholder equity investment of RMB 30-50 million (\$3.7-6.1 million); (b) GEF grant funds of \$2.0 million to support the company’s start-up costs, technical assistance requirements and technical assistance support to participating banks; and (c) GEF contingent grant funds of \$22.0 million to form a capital reserve, which, together with shareholder equity, will provide the company’s “economic capital” to support the company’s guarantee exposure. Provided that the Guarantee Company develops and maintains a good reputation, and the banking sector considers the capital reserve to be a suitably liquid and prudently managed, current experience with loan guarantees in China suggest that the company may be able to eventually enter into guarantee commitments of 3-5 times the capital reserves appropriated for this purpose. GEF seeks to maximize guarantee capacity from the capital reserve, aiming at guarantee commitments exceeding the capital reserve level from the first year onwards. Even with very conservative assumptions on the willingness of the market to accept guarantee commitments exceeding the level of the capital reserve, the guarantee facility will be able to support EMC-sponsored energy conservation investments of some \$250 million over the seven-year project period. This equates to a leveraging of about 11 to 1, in terms of investment over the period per dollar of GEF resources.

Use of GEF financing for the guarantee facility conforms with the GEF’s strong desire to develop “contingent financing” modalities for “win-win” energy efficiency projects. The GEF seeks arrangements where its grant funds may be used to compensate for (buy down) the risks considered too high by commercial investors but, in cases where the risks are indeed successfully overcome in project implementation, direct grants for financially successful projects are avoided. This project component will be one of the first major projects in the Bank adopting a contingent financing approach. No direct grants will be provided to EMCs or end-users. GEF financing for the guarantee facility’s capital reserve will be provided through the Government of China, by subsidiary agreement, for the temporary use of the Guarantee Company. Upon project completion, remaining funds can be redeployed for other greenhouse gas abatement projects agreed with the GEF and the Bank following procedures defined in the Grant Agreement. Preservation of the value of the capital reserve will be a key performance criteria for the company’s management, backed by a incentives-based performance management contract.

## **2. Key policy and institutional reforms to be sought**

None—the project is expected to be implemented within the current Chinese environment.

## **3. Benefits and target population**

The project will provide large, cost-effective reductions in energy use, GHG emissions and other pollutants (e.g., total suspended particulates and sulfur dioxide). Preliminary estimates of direct energy savings benefits over a ten year period (to be further analyzed and refined by project appraisal) total about 49 million tons of coal equivalent, equal to about 33 million tons of carbon (see Annex 4). Reduced energy costs in production yield benefits to Chinese consumers, while reduced local and global pollution benefit both local and global populations.

Because this project builds upon the investments made in the first phase of the China Energy Conservation Project, contingent financing is employed, and the Chinese energy efficiency market is so large, the cost effectiveness of GEF's projected net investment in the project is extremely high, at some \$15-20 US cents/ton of carbon avoided. This would be among the lowest cost per ton of carbon avoided in the GEF's entire portfolio.

## **4. Institutional and implementation arrangements**

The SETC will be responsible for coordination of project implementation, working together with the Ministry of Finance and other agencies and research units. The SETC's Project Management Office (PMO), established in 1997, has been effectively conducting project coordination activities for the first phase of the China Energy Conservation Project, and will continue its work during this second phase. The details of project implementation, however, will be the responsibility of the EMC Service Group, and the Guarantee Company in conjunction with its participating bank partners.

The EMC Service Group was formed in March 2001, under the umbrella of SETC's PMO, and employed five full-time staff as of August 2001. It is actively working on the implementation of the ASTAE-DfID project. The Group operates with the additional guidance of the China EMC Development Steering Committee, also formed in March 2001, and also playing an active role. The Steering Committee includes 11 senior staff and experts from the energy, business, finance and regulatory communities, and it plays an important guidance, coordination and advocacy role for the Phase II project as a whole. Although it is already working effectively under the current arrangement, the vision for the EMC Service Group in the future is for it to evolve into an independent and permanent institution, operating as a Western-type trade association for the EMC industry. Principles agreed with all parties include (a) open participation of new EMCs and various EMC industry stakeholders, and (b) primary focus on the provision of services requested and needed by its EMC members. While many "associations" exist in China, they have a different history, and somewhat different objectives and functions. Hence, the best legal entity and governance mechanisms for the Group over the long term require additional investigation. Technical assistance for this is being provided under the ASTAE-DfID project.

Institutional arrangements for the operation of the guarantee facility are under active preparation by SETC and other Chinese stakeholders. Four options have been closely considered: (a) formation of a new guarantee company specifically for the project; (b) creation of an EMC Credit Guarantee Fund managed by an independent fund management company; (c) appointment of an existing Chinese guarantee company to administer the program under Government and Bank supervision; and (d) deposit of funds with one or several participating banks to support/guarantee the extension of credit for EMC projects. Option (b) was rejected as too difficult to arrange in the current Chinese legal/economic environment.

Currently, the leading option identified is a combined approach, involving (a) establishment of a new guarantee company for the project, utilization of an existing guarantee company; and (b) enlistment of several participating banks as strategic partners to jointly implement the program with the guarantee company. Final decisions on the institutional arrangements, reached through broad consensus on the Chinese side, will be made prior to project pre-appraisal. If a new guarantee company is to be formed, it should be registered prior to project appraisal.

## **D: PROJECT RATIONALE**

### **1. Project alternatives considered and reasons for rejection**

Project design has been a gradual process over the last 16 months, involving many consultations with the three demonstration EMCs, new and emerging EMCs, domestic banks, central and local government officials, and international and domestic industry experts. Incorporation of a major investment (guarantee) component was included, as opposed to sole reliance upon information dissemination and capacity building, following surveys and repeated discussions with both new and merging EMCs and domestic banks, who outlined the severe constraints facing EMCs applying for loans with limited track records and assets. Operation of a competitive, small grant program for new and emerging EMCs was considered during the early stages of project design. However, it was decided to rely on the guarantee mechanisms only, and avoid direct grants to the EMCs, both to increase the leverage and potential benefits from the limited funds available, and to conform with the GEF's interests in promotion of "contingent finance" projects.

## 2. Major related projects financed by the Bank and/or other development agencies

Sector Issue	Project	Latest Supervision (PSR) Ratings (Bank-financed projects only)	
		Implementation Progress (IP)	Development Objective (DO)
Bank-financed			
Energy Efficiency	EC/GEF/IBRD China Energy Conservation Project	S	S
Energy Efficiency	China: Efficient Industrial Boilers	S	S
Energy Efficiency	IFC Hungary EE Cofinancing Program		
Energy Efficiency	Romania-GEF Energy Efficiency Project (FY02)		
Other development agencies			

IP/DO Ratings: HS (Highly Satisfactory), S (Satisfactory), U (Unsatisfactory), HU (Highly Unsatisfactory)

## 3. Lessons learned and reflected in proposed project design

Experience in other Bank/GEF projects, and in a variety countries, in promotion of EMCs/ESCOs has been fully reviewed and incorporated in the project design, particularly through active involvement of the task team in the Bank's Energy Efficiency and Environment Thematic Group. Contingent finance arrangements developed in IFC's Hungary Energy Efficiency Guarantee Project and the proposed GEF Romania Energy Efficiency Project were closely reviewed, and elements from these projects have been incorporated in the project design. The task team has also exchanged views with Brazilian experts involved in the GEF/IBRD Brazil Energy Efficiency Project, who also are considering the development of a loan guarantee program for ESCO projects.

As planned prior to submission of this project to the GEF Council, the PMO and Bank team have also completed, particularly through the Mid-Term Project Review, (a) an evaluation of implementation results of the initial pilot project in the EMC Demonstration Component, (b) an assessment of lessons learned, identification of issues requiring resolution, and proposed solutions: (c) conferences and consultations on EMC results with the domestic financial community, and (d) arrangements for suitable counterpart financing (see Annex 2).

## 4. Indications of borrower and recipient commitment and ownership

Borrower commitment and ownership is high. Development and expansion of the EMC industry has become one of the main directions of the Government's program to align its energy conservation strategy with the developing market economy. As mentioned in section D1, development of this project has involved many consultations with various stakeholders, to develop a broad consensus of approach. SETC has already formed the EMC Service Group, and has engaged high-quality consultants and experts from different sectors to undertake project preparation.

## 5. Value added of Bank and Global support in this project

With the active support and involvement of GEF staff, the Bank and Chinese teams have worked exceptionally closely since 1995 to develop energy performance contracting as a new investment mechanism in the Chinese market. The joint team has built new institutions, adapted foreign models to Chinese conditions, and addressed and solved a wide range of issues, some of which had never been encountered before. It is very important to continue the GEF/Bank/Chinese joint effort on past the initial, successfully demonstration phase, through to the most critical, dissemination and expansion phase. This will require additional institutional building challenges and additional innovative arrangements, building upon the relationships already developed.

As with the first phase of the project, GEF support of Phase II fulfills a role which no other entity can. There is no alternative investor willing and able to place sufficient funds in the high-risk position of the proposed new guarantee facility capital reserve, in order to achieve the potential broad global benefit expected.

## E: SUMMARY PROJECT ANALYSIS

### 1. Economic

Summarize issues below                       To be defined                       None

Economic evaluation methodology:

Cost benefit                       Cost effectiveness     incremental Cost     Other (specify)

Analysis of the incremental costs and the global environmental benefits of the project are outlined in Annex 4, including preliminary quantitative estimates.

### 2. Financial

Summarize issues below                       To be defined                       None

Preparation of the business plan, management and governance characteristics, and operating procedures for the EMC Loan Guarantee Program is a core and critical part of project preparation. Preliminary models of the business plan, completed by Chinese consulting advisors with assistance from the project team, show that under fairly conservative assumption, the facility can achieve a major investment leveraging impact and can achieve financial independence and sustainability within a period of five years, provided an initial grant investment is made to cover a portion of the initial start-up costs and operating overheads. Many key assumptions, however, dependent upon, and will be determined by, the financial markets in China (potential EMCs and lending banks). The guarantee fees that can be charged for different guarantee products, prospective default and recovery rates, the level of capital reserves required by the market over time to support any given credit exposure and hence financial leverage available to the company, the extent of risk sharing with banks, etc. all will be determined by the market over time. Preliminary estimates are based on the experience of guarantee companies in China to date, international experience in the guarantee business, and a series of discussions with the prospective market participants. These estimates will be refined through project appraisal. Even so, the reaction of the market will only be truly known during project implementation. It is especially important to establish the new guarantee program with good credibility and a sound reputation, and to ensure that this market reputation is strengthened during the early years of the project.

All market players consulted so far have clearly indicated that GEF funds will need to be disbursed upfront into the capital reserve of the guarantee company, in order to facilitate prior investment by prospective Guarantee Company shareholders, establish credibility in the market, provide the market with evidence of sufficient liquidity to meet unexpected defaults, and achieve meaningful leverage. This will require a waiver of standard World Bank disbursement guidelines (see also section E8 below), as has been done in the case of some GEF biodiversity projects in other countries involving the capitalization of various Funds. In turn, strict financial management, control mechanism, and acceptable audit procedures must be in place to ensure strict compliance with project-defined criteria and procedures for use of funds.

### **3. Technical**

Summarize issues below                       To be defined                       None

EMCs need to focus on project concepts with minimal technical risk to obtain the best returns, but they also need new ideas to develop market share. While most projects are expected to involve well-proven technology and concepts, the EMC Service Component also includes specific technical assistance to help EMCs develop new project opportunities.

### **4. Institutional**

#### 4.1 Executing agencies:

Under the coordination of SETC's existing PMO, project implementation will be undertaken by two new entities. Although successfully achieved under the first phase of the project, such institution building is always a challenge, and is a major focus of project preparation. Given the recent Government reforms and change in the reduction of the role of government agencies such as SETC in project implementation, however, both the Bank and Chinese teams feel strongly that the effort required for institutional building is necessary and most worthwhile. The Energy Service Group is already formed, under the umbrella of the PMO, as is capable of dispatching project implementation responsibilities (as it is now doing for the ASTAE-DFID EMC Training Project). However, it is the Government and Bank's intention for this Group to evolve into a permanent entity with a separate legal personality. Options are under active investigation under the ASTAE-DFID project. The final design of the guarantee facility is a major focus of the joint team's preparation work. The Facility design should be fixed prior to project pre-appraisal, and the proposed Company should be established by project appraisal. Substantial technical assistance will be provided to both new entities at the outset of and during the project.

#### 4.2 Project management:

Overall project coordination and day-to-day oversight of activities will be conducted by SETC's PMO, which has been in effective operation since 1997. The PMO will assist the EMC Service Group and Guarantee Company in matters relating to international donor/Bank project management.

#### 4.3 Procurement issues:

As the ultimate beneficiaries of the financial intermediary operation of the Guarantee Program, EMC's receiving loan guarantees backed with GEF funds will be required to conduct procurement according to reasonable commercial practices. Procurement for technical assistance aspects of the Guarantee Component, and the EMC Service Component, will be in accordance with IBRD Guidelines.

#### 4.4 Financial management issues:

Given the expected upfront disbursement of GEF funds for the guarantee capital reserve, special financial management, control mechanisms and procedures, and audit requirements should be designed and agreed to, over and above what is usually required for Bank projects. This is expected to include a required annual audit of the guarantee company by an internationally recognized auditing company acceptable to the Bank. Such additional auditing requirements and control procedures also can assist the Guarantee Company to establish and maintain high credibility and trust in the market.

### **5. Environmental**

5.1 This financial intermediation project will result in major positive impacts on the environment, in terms of improved energy efficiency, reduced air pollution, and reduce greenhouse gas emissions. No major adverse environmental issues are associated with the project. The loan guarantee program will indirectly support hundreds of small subprojects, which will be identified during project implementation. Few, if any, will involve any negative environmental or safety issues. To ensure proper management of any potential issues, however, it is proposed to include requirements that loan guarantee packages from participating banks and EMCs include certifications from the EMCs that (i) no projects supported by the guarantee loan will yield any negative environment impacts, or (ii) any projects identified with any potential negative environmental impacts will be implemented according an environmental management plan approved by the local Environmental Protection Bureau. The Guarantee Company will provide the Banks and EMCs with a list of potentially adverse environmental impacts to consider, for use in this certification procedure.

#### 5.2 Environmental category and justification/rationale for category rating:

FI – Financial Intermediation Project

5.3 As environmental benefits are the main objective of this project, the project key performance indicators include systematic monitoring and reporting of energy savings and greenhouse gas emissions reductions resulting from project activities.

### **6. Social**

6.1 No social hardships are anticipated as a result of the project, which will support relatively minor industrial and commercial building energy conservation retrofits and equipment renovation.

6.2 Project design has included consultations with a wide range of stakeholders, in the central and local government, research, NGO, industrial, commercial and financial sectors. Through the efforts of the SETC's PMO, the emerging EMC Service Group, and the marketing staff of the proposed Guarantee Program, major efforts are being initiated to increase awareness about EMCs in general, and opportunities for project support in particular. Access to initial technical assistance will be open to any interested parties. Access to more advanced training and technical assistance also will be open and transparent, but will require a specified level of corporate development.

6.3 NGOs and other civil society organizations involved in energy efficiency in China are a potentially important vehicle for marketing of the EMC concept and assisting groups to form EMC business proposals.

## 7. Safeguard Policies

7.1 Do any of the following safeguard policies apply to the project?

<b>Policy</b>	<b>Applicability</b>
Environmental Assessment (OP 4.01, BP 4.01, GP 4.01)	No
Natural habitats (OP 4.04, BP 4.04, GP 4.04)	No
Forestry (OP 4.36, GP 4.36)	No
Pest Management (OP 4.09)	No
Cultural Property (OPN 11.03)	No
Indigenous Peoples (OD 4.20)	No
Involuntary Resettlement (OD 4.30)	No
Safety of Dams (OP 4.37, BP 4.37)	No
Projects in International Waters (OP 7.50, BP 7.50, GP 7.50)	No
Projects in Disputed Areas (OP 7.60, BP 7.60, GP 7.60)	No

## 8. Business Policies

8.1 Check applicable items:

- Financing of recurrent costs (**OMS 10.02**)
- Cost sharing above country 3-yr average (**OP 6.30, BP 6.30, GP 6.30**)
- Retroactive financing above normal limit (**OP 12.10, BP 12.10, GP 12.10**)
- Financial management (**OP 10.02, BP 10.02**)
- Involvement of NGOs (**GP 14.70**)

8.2 In order to develop a guarantee facility which has credibility in the Chinese domestic market, and maximum potential for leveraging GEF's resources, as is a key GEF objective, GEF funds will need to be disbursed upfront into the Guarantee Facility's capital reserve, through the Ministry of Finance. This "capitalization" of the Guarantee Facility will require a waiver of the requirement under OP14.40 that the Bank follow its normal policies and procedures relating to disbursements for this portion of the proposed GEF grant. (See also sections E2 and E4.4 above).

## F: SUSTAINABILITY AND RISKS

### 1. Sustainability

The development of a self-sustaining (and growing) EMC industry in China is the objective of this project. The project has been designed specifically to achieve this objective, by aiming to involve domestic banks as the financiers of the industry, thus completing the full necessary market framework, and by developing a service-oriented EMC Group/Association for mutual EMC assistance.

A key goal of the EMC Service Component is to develop the EMC Service Group/Association into a permanent institution. The Component and its project implementation plan are being designed to best ensure that the Group/Association is fully self-sustaining by the end of the project, and able to operate effectively without outside revenue enhancement. The primary goal of the EMC Loan Guarantee Program is to assist new EMCs to overcome initial barriers in obtaining loan financing, and to develop domestic bank financing into the principal source of EMC credit. The proposed Guarantee Company will

be designed to achieve self-sustainability, and should be able to operate the EMC loan guarantee program as long as it is necessary.

## **2. Replication Plan**

This project seeks to replicate the EMC business model successfully implemented by the three demonstration EMCs in the first phase of the project, and to further adapt and adjust this model to meet different corporate and project conditions through a number of associated, but slightly different models. The project aims to replicate the existing and new and emerging EMC models on a broad scale across China. The project's objective is to complete the development of China's EMC industry to conform with China's market conditions--especially the market conditions of the banking sector—so that the industry can grow and further evolve in the market, without additional external public support.

The China Energy Conservation Project as a whole, including both phases, also provides a first test case for a variety of innovations in the energy efficiency project arena, which may be further adapted and utilized in other Bank and GEF energy efficiency projects. This project has been the first large project to succeed in achieving large investment levels through ESCOs, and aims to be the first Bank project using GEF financing in a contingent financing modality for loan guarantees.

## **3. Critical Risks**

Two categories of risks identified include institutional development risks and risks associated with the operation of the EMC Loan Guarantee Program.

Institutional development risks are encountered with the development of two new project entities (see Section E 4.1 above). To minimize the risk of ineffective institution building, SETC has maintained a deliberate and open process for institutional design, bringing in many stakeholders for consultations, encouraging development and comparison of different options. For the Guarantee Facility, SETC has organized a series of meetings, involving different agencies, companies and experts, to fully review and compare alternatives, endeavoring to arrive at a consensus view. For the EMC Service Group, a similar process is being followed, beginning with a full review of international experience, and consultations with ESCO Associations abroad. In addition, in seeking staff for the new institutions, Chinese counterparts are making a deliberate effort to seek the best experts available from the open market.

Establishment and operation of the new guarantee facility is by its nature a high risk project. Despite the successful demonstration, the EMC business is basically new to China. Actively employed for less than a decade, the operation of financial guarantees by specific guarantee companies also is relatively new in China, especially as a commercial as opposed to a political/social instrument. Some of the main risks include: (a) slower than expected EMC establishment and growth; (b) difficulties in establishing guarantee company credibility in the market; (c) less-than-expected leveraging and risk sharing; (d) difficulties for the guarantee company to cover its costs through guarantee pricing, due to market constraints; and (e) higher-than-expected defaults, stemming from EMC business difficulties. Measures incorporated in the project design to help minimize these risks include the use of the EMC Service Component to assist new EMCs to form and grow, upfront GEF disbursements to strengthen guarantee company credibility; and inclusion of a grant to the guarantee company for start-up costs to greatly assist in initial capacity building. In addition, the operating details of the guarantee facility will place strong emphasis on two themes: (a) incentives through the management performance contract for both capital preservation and maximizing EMC investment results; and (b) flexibility in operations, in order to allow adjustments to market reactions and unforeseen circumstances. Still, given these risks, initial capitalization of the guarantee facility, without a large presence from the GEF, is not possible. Although

there are enormous global environmental benefits which will be associated with success, the financial upside to potential guarantee fund investors is not at all commiserate with the risk.

**Annex 1: Project Design Summary  
CHINA: GEF Energy Conservation II**

<b>Hierarchy of Objectives</b>	<b>Key Performance Indicators</b>	<b>Monitoring &amp; Evaluation</b>	<b>Critical Assumptions</b>
<b>Sector-related CAS Goal:</b> 1. Alleviate infrastructure constraints 2. Promote enterprise competitiveness and efficiency 3. Safeguard the environment	<b>Sector Indicators:</b> <ul style="list-style-type: none"> <li>Quantified energy savings</li> <li>Operating cost reductions through energy efficiency (EE) investments</li> <li>Quantified CO<sub>2</sub> emission reductions from EE investments</li> </ul>	<b>Sector/ country reports:</b> <ul style="list-style-type: none"> <li>EMC guarantee company and EMC Group reports</li> <li>GOC and Provincial Environmental Reports</li> <li>National Communication to the UNFCCC</li> </ul>	<b>(from Goal to Bank Mission) CAS and GEF Objectives to Bank Mission:</b> Promotion of environmentally sustainable and commercial energy services and development
<b>GEF OPERATIONAL PROGRAM:</b> Removal of barriers to EE (OP 5)			
<b>Global Objective:</b> <b>Development Objective:</b> Achieve cost-effective improvements in EE on a commercially sustainable basis <i>Global Objective:</i> Sustainable removal of commercial barriers to EE investments	<b>Outcome / Impact Indicators:</b> <ul style="list-style-type: none"> <li>Total investments of EMC industry</li> <li>Number of profitable EMCs in operation</li> <li>Energy savings and CO<sub>2</sub> emission reductions from EMC projects</li> </ul>	<b>Project reports:</b> <ul style="list-style-type: none"> <li>EMC Group and project management reports</li> <li>Supervision missions and reports</li> </ul>	<b>(from Objective to Goal) Development and Global Objectives to CAS</b> <ul style="list-style-type: none"> <li>Stable macroeconomic conditions</li> <li>Ongoing reforms in state-owned enterprises</li> </ul>
<b>OUTPUT FROM EACH COMPONENT:</b> 1. Increased commercial investments in EMC projects	<b>Output Indicators:</b> 1.1 Total investment of EMC projects supported by guarantee facility 1.2 Number of EMC projects supported by guarantee facility 1.3 Number of participating banks 1.4 Guarantee facility is profitable	<b>Project reports:</b> <ul style="list-style-type: none"> <li>EMC guarantee company reports</li> <li>EMC Group and project management reports</li> <li>Supervision missions and reports</li> </ul>	<b>(from Outputs to Objective)</b> <ul style="list-style-type: none"> <li>Increasing lending of commercial banks to EMCs</li> <li>Sufficient creditworthy enterprises to sustain EMC industry</li> <li>EMC access to quality EE technologies and know-how</li> </ul>
2. Increased capacity for EMC industry to identify and implement EE projects	2.1 Number of EMCs implementing projects 2.2 Number of EMCs and staff trained		
<b>Project Components / Sub-components:</b>	<b>Inputs: (budget for each component)</b>	<b>Project reports:</b>	<b>(from Components to Outputs)</b>
1. EMC guarantee facility	1. Contingent grant of US\$22 million; final grant of US\$3-5 million expected	<ul style="list-style-type: none"> <li>EMC guarantee company reports</li> <li>EMC Group and project management reports</li> <li>Supervision missions and reports</li> </ul>	<ul style="list-style-type: none"> <li>Commercial banks willing to accept partial guarantees for EMC projects</li> <li>Investors willing to establish new EMCs</li> <li>Ability of new EMCs to operate successfully</li> </ul>
2. EMC Development and Service Group	2. US\$2 million grant		

## **Annex 2: China's EMC Industry**

### **CHINA: GEF Energy Conservation II**

This annex provides further details on the results of various evaluation of the implementation results of the EMC Demonstration Component of the first phase of the China Energy Conservation Project, an assessment of lessons learned and issues and their solutions resulting from these evaluations, the results of consultations with the Chinese financial community, and the results of market soundings on new and emerging EMCs.

#### **EXPERIENCE OF THE THREE DEMONSTRATION EMCs**

The results of the demonstration EMCs in Beijing, Liaoning and Shandong supported under the first phase China Energy Conservation Project have been very closely monitored from the beginning. The Bank and SETC have conducted in-depth, formal reviews together with the three EMCs at least twice per year since the EMCs were founded in 1997, as part of the project supervision process. The reviews include evaluation of each EMC's project portfolio, financial results, energy savings and carbon reduction results, management and institutional building efforts, project procurement, business plans for the future, and outstanding issues and options for their resolution. Findings are reported in PMO and EMC biannual reports, and the biannual Bank project supervision mission aide memoire reports. A major Project Mid-term Review was conducted by the Bank, SETC and MOF in November 2000, in accordance with original plans, and the mid-term review aide memoire report is available in the project file. The PMO commissioned an outside, independent review of the status and work of the three EMC in 2000, which was completed by the China Energy Conservation Investment Corporation's consulting department, and used as an input for the project mid-term review. GEF Secretariat staff also conducted independent site investigations of this project in 2000, and this and other information was utilized by the Secretariat's consultants in their preparation of a 2000/2001 review of the results of GEF-supported projects involving ESCOs.

Overall progress has been quite satisfactory, with each of the three pilot EMCs developing their respective businesses. Given that their business is entirely new in the Chinese market, the progress of the three EMCs has been exceptionally good by international standards. As of May 2001, the three EMCs had entered into 173 energy performance contracts with aggregate investment of US\$33.7 million (RMB 279 million). Of this total, \$3.3 million was supported by the European Commission (EC) grant, \$7.0 million from the GEF grant, \$12.0 million from the IBRD loan and \$11.4 million from internal and other financing. An additional \$4.9 million projects had been approved and contracts were under negotiation. Average annual financial rates of return of the subprojects have exceeded 20% per year. Repayments from EMC customers (referred to as host enterprises) has been exceptionally good—with very few exceptions, payments have been made according to contract. As of May 2001, EMC investments were delivering an aggregate energy savings of about 500 thousand tons of coalequivalent (tce) and associated carbon dioxide emission reductions of about 330 thousand tons of carbon (t-c). In 2001, the three EMCs plan to continue their corporate growth and development of their project portfolios, entering into 74 performance contracts with an aggregate investment of RMB 197 million (\$23.7 million). Based on progress with their 2001 plans to date, this would result in 54 new projects with additional investments of RMB 137 million (\$16.6 million) by the end of 2001.

#### **Special Characteristics of the Chinese EMCs**

While EMCs in China are, in many respects, similar to ESCOs in the West, there have been a number of unique features about business strategies and operations that have developed over the past five years, including:

The EMCs have provided all of the financing for their projects (although host enterprises may finance and complete additional related renovation works themselves.) The EMCs' in turn, borrow funds for their operations based on the strength of their balance sheet. Host enterprises are not a party to loan obligations from the lender to the EMCs.

The projects of EMCs typically include project design, equipment financing, equipment procurement, equipment installation, commissioning and testing, and limited maintenance. The core ingredients of all projects include financing, procurement, installation and testing/commissioning. Design work usually also involves host enterprise staff.

Projects do not follow detailed facility audits, but rather are designed to focus on one technology or system ("project lines"). Thus the constraint of audit costs or project development costs are not as critical an issue with Chinese EMCs as with Western ESCOs.

Projects are truly energy conservation projects—cash flows resulting from energy savings are the main benefits. Projects typically are in the \$200,000-400,000 range and the contract terms are generally about 2-3 years. Coal-saving projects are at least as common as electricity-saving projects.

Technology and equipment is primarily domestic—for the fairly common types of equipment involved, foreign companies generally cannot compete on price with Chinese manufacturers. Also, many of the projects are too small to attract serious interest from international suppliers.

Energy performance contracts between EMCs and clients have been significantly simpler than typical ESCO contracts in the West. Project design and energy savings estimates are reviewed and agreed by both parties. Payment schedules are negotiated and fixed in the contracts, based on a percentage share of the estimated energy cost savings of the project which will accrue to the EMC (generally 60-100%). Energy savings guarantee clauses are included, stipulating how payments would change if actual savings per unit of output or time period are determined through testing to be substantially (e.g. 5-10%) higher or lower than estimated. Testing is simple, and much of the energy savings are, in fact, stipulated after commissioning. There have been virtually no disagreements about savings and payment levels—as long as the equipment performs as planned, the payment schedules established in the contracts are retained. There has been no demand from host enterprises for in-depth or complex energy savings monitoring and verification.

For the EMCs, the most important single criterion for project selection is the financial assessment of the host enterprise, and the EMC's evaluation of the enterprises' willingness and ability to make payments. Some form of financial guarantee/definition of collateral is often included in the energy performance contracts.

Financial management of their project portfolio and associated risks is a major part of the EMC business.

### **EMC Markets and Project Lines**

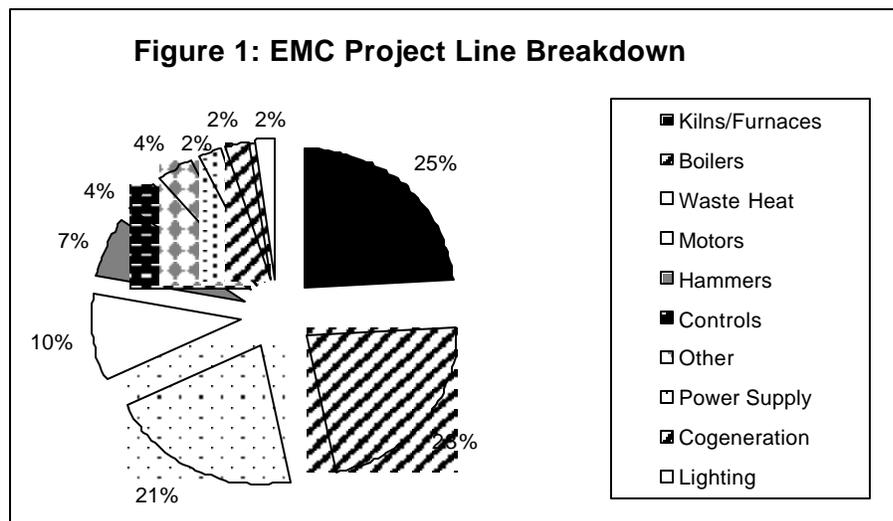
The potential for financially attractive energy efficiency projects in China remains substantial. Given the enormous size of China, the sheer number of industrial and commercial energy users, the age of equipment and technologies employed and relative energy intensities, it is clear that new and existing EMCs will have a robust pipeline of energy efficiency projects to pursue over the foreseeable future. The resounding success of the three pilot EMCs have clearly demonstrated that the EMC model can work in China and represents an attractive service option and alternative project financing source for domestic enterprises. The experiences of the three pilot EMCs to date, while not an exact representation of the full Chinese EMC market, offers valuable data about the market for EMC project investments in China.

Initial business experiences among the three EMCs, with critical EC and GEF support, allowed each EMC to test a range of technologies and applications and identify markets to replicate successful project lines. While all three EMCs continue to offer a number of similar project lines, their project portfolios and markets have begun to develop along distinctive paths based on differences among each of the EMCs' service territories and company expertise: Beijing, which has a lighter industrial base, has focused more on heating and cooling systems in hotels and office and residential buildings (electric heaters, heat pumps); Liaoning has a high concentration of industry, particularly iron/steel and chemical plants, and has found boiler and kiln/furnace renovations to offer high marketability; Shandong has been

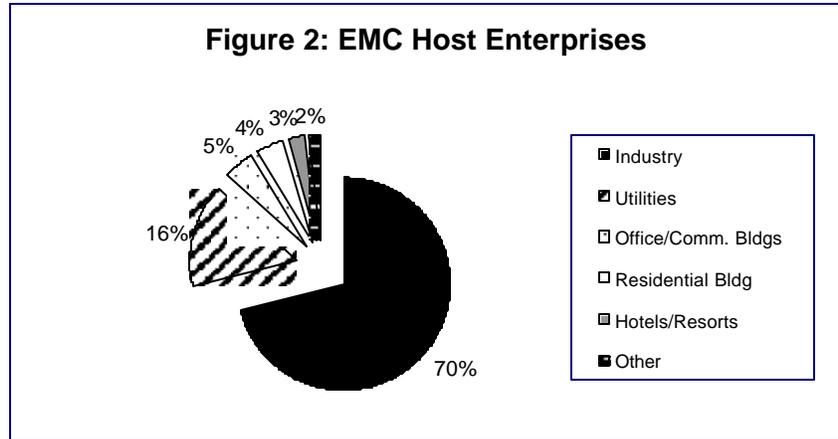
able to replicate motor system improvements in a diverse range of host enterprises and found a few large, creditworthy enterprises in which to develop a pipeline of different technical renovations. While these individual EMC markets have shown their differences, the collective market of these three EMCs can be viewed to be more representative of the larger Chinese market.

Since the companies began, the three EMCs have received Bank/PMO approval for about 193 performance contracts in about 14 different project lines, for a total investment of over US\$40 million. Key product lines supported have included boiler renovations (layered combustion systems, boiler replacements, FBC), kilns/furnaces (cement and ceramic kilns, electric arc furnaces, glass furnaces), waste heat (waste heat recovery, ground source heat pumps, condensed water recovery, fuel switching), cogeneration, steam hammer renovations, motor drive systems, power supply (electrical distribution systems, transformers), automatic control systems and lighting systems (CFLs, ballasts). A breakdown of the total EMC investments by technical project line is shown in Figure 1.

In terms of host enterprises, industrial projects clearly have been the largest market for the three EMCs and will likely continue to be a major market for new EMC projects. Within the industrial sector, major subsectors have included iron and steel, chemical, rubber, and textile, although many of the technical renovations (e.g., kilns, boilers, motors) are not industry specific. The three EMCs have also found a strong market for energy efficiency projects with utilities (power, heat and water) and, given their much stronger financial positions, have developed project lines for their operations. Each of the pilot EMCs has also sought to balance their portfolios with some non-industrial projects, such as heating and cooling renovations in government/commercial buildings, lighting projects in hotels/tourist resorts, and projects in shopping centers, hospitals, and farms. Figure 2 contains a full breakdown of EMC customers.



While project lines have not changed vastly from initial plans, each EMC has found elements of competition from equipment suppliers as project lines are developed and actively marketed. Once newer technologies have been demonstrated and simpler renovations implemented, the ability for the EMCs to market these project lines while requiring high returns has steadily diminished over time. Thus a key aspect of the EMC business has been to maintain a step ahead of the market and build upon simpler renovations to improve a project line's business life. As the larger EMC industry develops in the future, it is certain that the market will continue to evolve and, as competition increases, EMC projects will grow in their levels of sophistication and diversity.



### Issues and their Resolution

The main issues identified and discussed during the November 2000 Mid-Term Project Review on the Demonstration EMC Component included: (a) urgent needs to clarify the nature, legal standing and tax treatment of the EMC's energy performance contracts, as these instruments are new and are being interpreted in different ways by different entities; (b) difficulties experienced by some EMCs in developing markets for a high volume of business without excessive risks, and needs to continually develop new product lines and expand the service content of projects; and (c) the need to consider adjusting the procurement plans under the project.

As the business of the three EMCs grew over late 1999 and 2000, confusion mounted among authorities at various government levels as to how to classify the EMC business for purposes of economic regulation, taxation and financial auditing. Some local authorities even stated beliefs that the business did not conform with existing regulations. As practiced by the three EMCs, the EMC business defies easy classification into traditional categories, as it combines elements of technical service, equipment sale with deferred payments, construction and installation contracting, and project management and equipment maintenance into one contract package. Although it was not known initially what specific problems would be encountered, the surfacing of these types of problems was expected at the outset of the project—indeed a key goal of the demonstration project was to adapt the ESCO model to Chinese conditions, solving various implementation issues as they arose. During 2000, the issue of classification of the EMC business was debated many times at different levels. Finally, in a comprehensive meeting with various relevant authorities on April 26-27, 2001, organized and chaired by SETC, it was concluded and officially documented that "...the business operation of energy performance contracting conforms to Chinese existing laws, and legal status problem for EMCs referred to by some persons does not exist." Financial auditing and economic regulation issues have thus been satisfactorily resolved. Tax treatment of EMCs, however, remains under investigation. SETC's PMO and the EMC Industry Development Steering Committee are completing their research of this issue, after which the central government's Bureau of Taxation is expected to make a ruling on taxation of energy performance contracts.

With respect to market development, the three EMC managers will be the first to admit, despite their success, that the EMC business is not simple and easy. The business requires striking a difficult balance between financial risk and returns, between investment and service, between technical value-added and minimal technical risk, and between new business models and traditional methods of doing business. EMCs must maintain a balance between high quality technical staff with constantly evolving project lines and markets, seek out new technologies and practices to maintain a competitive edge, achieve corporate growth without sacrificing quality and customer service, replicate and expand promising project lines

while maintaining high financial returns and repayments, and develop innovative ways to isolate project cash flows in less creditworthy enterprises.

The three pilot EMCs in particular are already seeking ways to address many of these issues by establishing strategic partnerships with technical institutes and local banks, improving their financial appraisal and management systems, conducting market and technology reviews, etc. and will continue to explore alternatives as their businesses and markets evolve. Greater EMC value-added for clients (preserving comparative advantage and resulting in strong project financial returns) can be achieved through new technical concepts, or use of technologies still relatively new in the Chinese market. In addition, greater value-added can also be achieved through better integration of service aspects in project packages—this has been the key to ESCO business successes abroad. While service aspects may be of less interest to some clients in the Chinese market, the EMCs may find significant opportunities by placing additional emphasis on marketing “full service” packages, whereby the EMCs would offer to review industrial facilities and processes and design customized projects which could optimize energy use using a series of improvements/projects.

With respect to procurement, difficulties have been experienced in project implementation to adapt EMC procurement to World Bank guidelines. Means to allow increased flexibility are under discussion. For the Phase II project, however, similar issues are not anticipated, as the Bank will not be directly involved in the financing of any EMC subprojects.

## **EMERGING EMC INDUSTRY MARKET**

### **New EMCs**

Based on the successful business development of the three pilot EMCs, there has been substantial interest by potential EMCs and investors in creating new EMCs in China. There are about 6-8 newly formed EMCs, with registered capital of under 5 million yuan (about US\$600,000) and 20-30 staff. However, given the complex nature of the business and general unfamiliarity of energy performance contracting in China, investments made by these companies have been limited to date. An additional 10-15 groups have established EMC subsidiaries but have suffered from very limited equity, business know-how and EMC operational experience. Aside from these newly formed EMCs and potential EMCs, there are about 180 provincial energy conservation centers, which were established in the 1980s to provide technical support to industries in areas of energy conservation. With the transition from a central-planned to a market-based economy, these centers will need to find opportunities to market their services on more commercial terms in order to remain in operation – the EMC business model represents an attractive option for their sustainability. However, not all of these centers will be able to successfully make the transition to the market economy.

In July 2000, the PMO organized a seminar for groups interested in developing EMCs on the EMC business potential in China. Over 90 firms attended the seminar and/or formally expressed their interest to the PMO in the EMC business. The candidates included 32 energy conservation centers, 35 equipment suppliers, 20 service providers and 3 potential equity investors. Ten of these candidates claimed to be in the EMC business already, 20 were actively exploring the EMC business and 60 were interested in more information about the EMC business. Some of the interested EMCs had parent companies with significant access to project financing (e.g., power utilities) but lacked the knowledge and know-how to develop a reasonable business strategy and marketing plans. Others had some technical knowledge but lacked the equity and/or financing to increase their business volume. All parties fully expect that additional notifications and seminars on the EMC concept, as planned by the EMC Service Group, will also yield many additional expressions of interest.

Many more EMCs are being formed and will continue to be formed in the future, and business models are likely to vary based on prevailing market conditions. Future EMCs may develop as subsidiaries or joint

investments of many types of corporations, including companies strong on energy efficiency services; electricity, heat and gas utilities; financial enterprises; equipment suppliers, etc. Many of the characteristics described above for the initial three firms, however, are likely to continue as industry trends—and certainly, the EMC industry in China will continue to develop along some different paths than those in the West.

As noted previously, a major aspect of the EMC business in China to date has been their ability to provide project financing as an integral part of their overall service. This model has allowed EMCs to package the entire project together and thus offer complete project service to their customers. It has also proven very attractive to host enterprises, offering a clear alternative to on-balance sheet debt since payments to the EMCs can be accounted for as operating costs. In addition, prevailing banking regulations, which include fixed interest rates, have prevented domestic banks from being able to charge financing fees commensurate with credit risks and they have thus shied away from new areas of business like EMC project financing. Until banking reforms deepen, the interest of domestic banks in providing loans directly for small energy conservation projects may continue to be weak, unless EMCs are involved in project packaging. Many Chinese government and enterprise officials also believe that EMCs that do not offer financing as part of their overall service package, but simply arrange project financing, will not attract sufficient business to survive in today's Chinese market. Thus this model, where the EMC provides financing as part of their overall packaging service, appears to best meet the market demand and has the greatest business potential. However, as the EMC industry and market develops and banking reforms progress, it is expected that the EMC industry will become more diversified in its financial modalities and levels of sophistication. While it is expected that EMCs will continue to provide project financing over the near to medium-term, a wider range of EMC business models are likely to develop and the project will seek to encourage these new models. Where EMCs have established relationships with local banking partners, it is expected that banks may provide financing directly to the host enterprises, with payments then directed to the EMC based on project performance. In cases where international technologies and/or processes are not widely available in China but well-suited to local applications, international-local joint-venture partnerships will be encouraged. Where EMCs cannot or do not wish to provide financing, options for performance-based service fees, leasing arrangements, equipment sales, technical audits and consultations, etc. can all be supported provided a majority of the cash flow is derived from energy savings. And as competition increases in the supply of equipment, service and financing, EMCs may find the need to specialize in specific aspects of project development/implementation in order to maintain their relative market shares and comparative advantages.

### **Consultations with Financial Institutions**

The success of the three EMCs so far has generated intense interest among many other Chinese parties in developing EMC businesses of various types. Over the past 1-2 year, the Bank, PMO and existing/new EMCs have participated in over three workshops and numerous individual meetings with Chinese financial institutions to discuss the potential for energy performance contracting in China and gauge interest in EMC project financing. The Bank team and PMO also met with guarantee companies, potential EMC equity investors, and potential GC equity investors to discuss interest and participation in the Phase II program. (A full list of seminars and meetings with Chinese banks and a list of participating banks is included in the Project file.)

Many domestic banks expressed interest in the EMC concept, especially as this may provide a useful tool for them to enter into the energy efficiency investment business. The ability of EMCs to bundle projects together, and shoulder the technical and performance risks of projects, are attractive to bank officials. However, concerns were raised about the newness of the concept, the lack of sufficient track records in most EMCs, and guarantee or loan collateral issues. These comments and concerns, raised on a number

of occasions, in different settings and with different banks, have been a key input for the design of the proposed project.

### **Annex 3: Description of the Project CHINA: GEF Energy Conservation II**

As described in the main text, the proposed project includes two components: (a) an EMC Service Component, designed primarily to provide in-depth, practical technical assistance to new and emerging EMCs on development of their businesses, and (b) an EMC Loan Guarantee Program, designed to provide new and emerging EMCs with enhance opportunities to receive loans from domestic banks, and to engage the banks in the development of a sustainable EMC industry.

#### **EMC SERVICE COMPONENT**

This component consists of a large capacity building and technical assistance program to raise broad awareness of the EMC mechanism, assist new EMC to develop into established businesses, and help develop policy support. The component will be supported with \$4.5 million from the project, including about \$2.5 million from U.K.'s DfID. Although some international technical assistance will also be involved, the primary focus will be to rely on Chinese experts and business people who are well versed in the development of Chinese EMCs and their potential to assist new, emerging companies. The component includes the development of the EMC Service Group into a permanent, self-sustaining institution, acting as a Western-type service oriented trade association, to implement this function over the short and long term.

#### **The EMC Service Group and Steering Committee**

The SETC formed the EMC Development and Service Group (EMC Service Group), currently under the umbrella of the Project Management Office (PMO) of the World Bank/GEF China Energy Conservation Project. As of August 2001, the EMC Service Group included 6 full time employees. The function of the Group is to provide service to new and emerging EMCs, including:

Development and implementation of a massive and detailed training program for new and developing EMCs, in line with needs expressed by them, including assistance in EMC establishment, corporate structuring and identification of types of corporate partners, assistance in project identification and development, assistance in overcoming operational problems, etc.;

Acting as an advocate of the EMC industry in China, and recommending policy and support activities to the Government, international institutions, and other key groups, which will foster healthy industry growth;

Preparing and disseminating basic information concerning the EMC business throughout China;

Recruiting new Group EMC Members, and developing feedback mechanisms for improving member services and developing new services; and

Meeting and coordinating with financial institutions to introduce the EMC business, to explain performance contracting, and to discuss potential roles and benefits of financial institution participation.

Measures of the Group's effectiveness will include the number of commercial EMCs operating, and the volume of energy efficiency investments implemented through EMC activities.

In addition to SETC, the EMC Service Group operates with the advisory assistance of the EMC Development Steering Committee, also formed in March 2001. The Steering Committee is a high-level group, established to guide the overall development of China's EMC industry. The group includes highly-respected retired senior officials concerned with energy policy and energy conservation, bank managers, authorities from the electricity utility industry, officials involved in taxation and auditing, a legal representative, and business people from the energy conservation industry. The Steering Committee meets at least four times a year, and its Vice-Chairman is working about half-time on Steering Committee tasks. The Steering Committee's work program includes a number of site visits every year, and a

research of specific operational topics confronting the EMC industry from time to time. The responsibilities of the Steering Committee include:

To direct the operation of the EMC Service group.

To guide the accomplishment of a strategic development plan for EMCs industry.

To scrutinize, monitor, and assess the business operation of the three demonstration EMCs, and to summarize and comment on their accumulated experience.

To evaluate the training course plan and its implementation by the EMC Service Group, and assess actual results achieved.

To coordinate with relative government policy-makers, with the objective to create a harmonious environment for EMCs development.

To boost and attract potential EMCs, and to seek potential EMCs partnership, in part through support of individual Committee members.

### **Near-term Work Program**

The EMC Service Group's work program during July 2001-June 2003 focuses particularly on the establishment of its large-scale training program and some other services, and definition of its institutional future. About \$2.5 million of grant financing from the U.K.'s Department for International Development (DfID), through the Bank's Asia Alternative Energy Program (ASTAE) provides partial support for this work. The work program includes:

***EMC Service Group development.*** An international workshop is being held in Beijing in September 2001 to review the experience of national ESCO Associations in other countries, and lessons learned relevant to the Chinese situation. International and domestic experts will then work with the SETC's PMO, the EMC Steering Committee and the EMC Service Group to develop the best institutional model for the EMC Service Group as a permanent institution.

***EMC training program.*** With over 100 Chinese firms registering interest in training, and more expected, training of prospective EMC staff is an urgent and massive task. The first task underway is to complete the full design of the training package. Customized training materials and courses are being developed from scratch, drawing especially on experience in China to date, and geared solely for the Chinese EMC industry. Using international advisors, especially on modern business-school type course preparation and delivery, the materials will be prepared and courses delivered primarily by Chinese experts. Preliminary plans include the development of 5 courses, including one Introductory Training Course, and four advanced courses/seminars. Groups registering an interest in EMC training, in response to broadly disseminated notifications issued by SETC, will be entitled to seats in a series of relatively large Introductory Training Courses. Firms meeting specific criteria (including a certain level of progress in EMC corporate development) will then be entitled to participate in the advanced courses, provisionally including courses on (a) EMC corporate structuring and business operations in the Chinese market (for company management), (b) energy performance contract project development and management under Chinese conditions (for project and operations managers), (c) EMC financial management according to Chinese laws and practices (for company and financial managers), and (d) clinics/workshops on pressing issues, emerging opportunities. About 12 courses are planned for delivery in the first 12 months, including, possibly, 5 introductory courses, 4 courses on EMC corporate structuring and business operations, 2 courses on EMC project management, and 1 clinic/workshop.

***Raising awareness of the banking sector.*** The EMC Service Group will sponsor a series of workshops, prepare necessary dissemination materials, and conduct consultations with Bank officials to improve local commercial bank understanding about the nature of the EMC business and its potential in China. This work will be coordinated with more intensive technical assistance efforts for several specific banks to be conducted by the proposed Guarantee Company.

**Review of EMC business opportunities.** International and domestic experts are assisting the EMC Service Group to complete a review of state-of-the-art-technologies abroad which offer good potential for EMC applications in China, and to disseminate these ideas to EMC members. Case studies of several new, integrated and full-service EMC project concepts also will be prepared.

**Partnership development.** The EMC Service Group will organize workshops and other “match-making” mechanisms to facilitate foreign-local ESCO joint ventures, bank-EMC partnerships, and EMC-equipment supplier alliances which can capitalize on the comparative advantages in developing new EMCs.

**EMC business marketing.** An important function of the EMC Service Group is to market EMC services to all sectors in China, to further sensitize potential customers and to increase awareness among local government entities. This will involve a series of presentations and preparation and dissemination of marketing materials to various business associations, etc.

### **Medium-term Work Program**

The medium-term work program for the EMC Service Group/Association primarily involves a continuation and further deepening of the work begun during its first two years. Operation of the EMC training program will remain a very large task, as will continued efforts to raise awareness in different economic sectors, and identification and dissemination of new EMC project concepts. In addition, the Group is expected to play an increasingly large role in public policy development with the relevant Government agencies, in the interests of the growing EMC industry. Membership coordination, database development for member use, and development of sophisticated member service request and response functions also will be increasingly important as the Group’s work develops. Information exchange and mutual cooperation with ESCO Associations in other countries also will be important.

GEF grant financing of \$2.0 million is needed to partially support the medium-term work program (see Table 1 below). This includes about \$1.0 million to support the provision of services to EMC members, about \$ 0.4 for the institutional development of the EMC Association itself, and about \$0.6 million for comprehensive EMC development monitoring, evaluation and reporting. The subcomponent for an estimated \$1.0 million of GEF financing would provide partial support for (a) and include delivery of EMC training programs, technical assistance and advisory services to new and potential EMCs, publications (member surveys, newsletters, manuals), policy advocacy, EMC business promotion and marketing, assessments of new EMC business opportunities, etc. As the EMC Association will be a new institution, about \$0.4 million in GEF funds will be required to support the development of revolving business plans, exploration of various options for revenue sources in addition to membership fees, training of EMC Group staff, and periodic exchanges with ESCO associations from other countries (particularly within the region). \$0.6 million will also be required from the GEF to support monitoring and reporting to the World Bank and GEF on aggregate investment figures, number of EMCs and EMC projects supported, total energy saved, and total carbon emissions reduced from EMC projects through EMC and customer surveys, project inspections, and reporting. The EMC Service Group will be charged with the responsibilities for conducting market surveys, maintaining databases, and compiling information from members and the Guarantee Association on the progress of the development of the EMC industry in China as a whole, including the numbers and types of firms, subproject investment types and quantities, total energy savings and associated carbon dioxide emissions reductions, prevailing problems and obstacles and recommendations on solutions. This reporting will be a key input for the Bank’s project supervision work.

**Table 1: Preliminary EMC Service Group/Association GEF Budget**

<b>Component</b>	<b>Subtotal (USD million)</b>	<b>Cost (USD million)</b>
EMC Services		
EMC Training Courses	0.40	
TA and Advisory Services/Publications	0.20	
Policy Advocacy	0.10	
EMC Business Development and Marketing	0.30	
<b>Sub-total</b>		<b>1.0</b>
Institutional Development		
Business Plan Development	0.20	
Staff Training	0.10	
Regional ESCO Association Twinning	0.10	
<b>Sub-total</b>		<b>0.4</b>
Monitoring and Reporting		
EMC and EMC Customer Surveys	0.25	
Periodic Project Inspections	0.25	
Publications and Reporting	0.10	
<b>Sub-total</b>		<b>0.6</b>
<b>TOTAL</b>		<b>2.0</b>

Increasingly over the project implementation period, the Group/Association will gradually develop revenues, from its membership and other sources, to sustain its costs, including the costs of engaging outside expertise. By the end of the five-year period, the Group Association must be fully self-sustaining from these revenue sources. Revenue development, however, must be gradual—particularly in the Chinese environment, where many “associations” provide little if any real service to membership, the Group must demonstrate that it can provide service and value added to members which are well worth paying for. The Group’s advanced training courses, for example, must first gain a high reputation before many participants will be willing to pay substantial fees for the privilege of attending.

The EMC Service Group will complete a full Project Implementation Plan (PIP) for review during project pre-appraisal, detailing implementation plans for its medium-term work program, including all subcomponents to be financed by the GEF, and its business plan to achieve financial sustainability. The PIP will be finalized at project appraisal.

## **EMC LOAN GUARANTEE PROGRAM**

### **Loan Guarantee Facility Structure**

The Chinese and Bank teams regard a new financial guarantee facility as the most appropriate means in the Chinese context for dealing with the current financing barriers facing EMCs. The rationale for using a guarantee mechanism is founded on a combination of financial market conditions, principally (i) the existence of credit risk barriers; (ii) conservative credit and lending practices; and (iii) available funds in the capital market that are not being deployed. The guarantee mechanism is intended to induce banks to enter this market and deploy their own resources to finance EMC projects, and, generally, to overcome the credit risk barriers and demonstrate the viability of these types of projects. Guarantees are appropriate to use when financial resources are available in the market, but need an incentive to be deployed. Energy efficiency markets are often plagued by a mismatch between what constitutes a technically and financially sound energy efficiency project versus what constitutes a creditworthy bankable project. Further, in developing financial markets, gaps often exist between perceived credit risks, as reflected in

credit underwriting practices, and actual credit risks. These may arise due to financial conditions within the banking system and/or within the universe of prospective borrowers. Commercially oriented guarantees can help bridge these gaps.

Suitable loan guarantee facilities for EMC projects are not available in China. China's loan guarantee industry is relatively new, underdeveloped, regionally focused and largely directed towards promoting other specific public policy objectives. The largest guarantee company, the China National Investment and Guaranty Company, Ltd. (ING), was founded in 1994 with the support of SETC and MOF. This company has developed a loan guarantee program for small and medium enterprises, but its actual guarantee undertakings have only developed on a large scale during the last few years. Most other companies were formed in the latter part of the 1990s and are generally of three broad types: i) institutions that are financed and managed by regional government such as Shenzhen Hi-tech Industry Investment Company, Sichuan Economics and Technology Guarantee Co. and Fujian Investment Guarantee Company; ii) companies founded by groups of enterprises such as Beijing Xinbao Investment Management Company and Dalian Credit Guarantee Company; and iii) companies financed by the government but owned by and for the benefit of a specific group of enterprises like Wuhan Hi-tech Industry Investment Guarantee Company, Shenyang Tech Institution Loan Guarantee Fund. The paid in capital of these companies varies widely ranging between US\$ 1.5 million to US\$ 65 million. Many of these companies guarantee 100% of loan amounts, removing any real risk from the banks involved. Guarantee fees charged to date are often quite low (often 1% of the guarantee exposure per year), but counter-guarantee requirements (collateral and/or third party suretyships) are often very stringent, and similar to those of the commercial banks (perhaps undermining the rationale for the guarantee programs in the first place).

The proposed loan guarantee program aims to develop the EMC market while earning a market return (as opposed to making purely development-oriented investments.) Additional requirements include national coverage, and a mechanism which increasingly involves the domestic banking industry as the primary source of credit for the EMC industry. Four options have been developed and reviewed:

- formation of a new guarantee company;
- creation of an EMC Credit Guarantee Fund that is managed by an independent fund manage company;
- appointment of an existing guarantee company to administer the guarantee program with the GEF funds under supervision of the government and the Bank; and
- deposit of the funds with one or several participating banks to support/guarantee the extension of credit to EMC project.

None of these options address adequately all of the objectives of the fund in respect of national coverage, management control, institutional capacity or leverage and, after considerable analysis of the pros and cons of each, an arrangement was constructed drawing on the relative strengths of each. The overall institutional structure under consideration is depicted in Figure 1. Under this scheme a new guarantee Fund (the GF) will be formed to support the business of underwriting the credit risks of loans made by a select group of participating banks to EMCs or host enterprises for energy efficiency projects. It will be supported by a the shareholders of a new guarantee company with specific experience in assurance, banking and energy efficiency investments, or the management of an existing guarantee company such as ING. Equity investments from these shareholders or co-financing by an existing company are expected to total RMB 30-50 million, and will be used to form part of the guarantee funds. In the event that it is necessary to form a new company there will be no controlling shareholder, and the company will be open to new investors to progressively expand its level business. The guarantee program will also be supported by strategic partnerships with participating commercial banks to provide national coverage, deal origination, risk screening and processing capacity.

**GEF Contingent Grant.** GEF “contingent grant” funds of \$ 22 million will be provided to the GF as a capital reserve. The funds will be provided by the Ministry of Finance (MOF) to the GF through a subsidiary, “contingent grant” agreement, specifying the objectives to be achieved with the funds, use of proceeds, reporting requirements, fiduciary responsibilities, financial control mechanisms, etc. The funds will remain the property of the Government, allocated for the use of the GF in support of its guarantee portfolio. The capital reserve should be created in such a way that the participating banks regard these funds as a credible liquid reserve supporting a guarantee portfolio eventually 3-5 times as large. The contingent grant agreement should provide for the return of funds to the Government when no longer required (e.g., in the event that the GF achieves a sustainable level of business and other investors can be substituted). Additional design principles underlying the structure include:

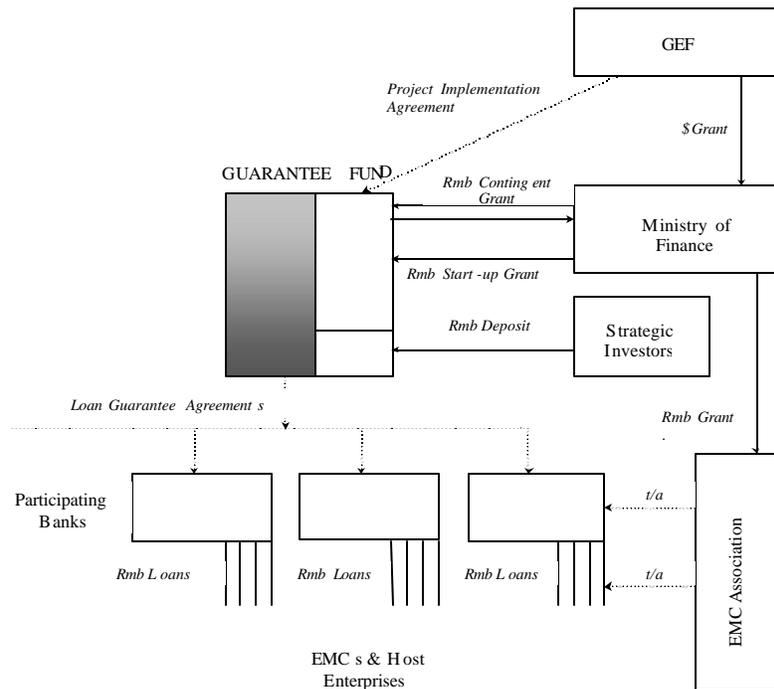
GEF contingent funds need to be disbursed by the World Bank upfront, to create the GF’s initial capital base. The need for a lump-sum capitalization of this Fund is predicated on i) establishing sufficient financial credibility to attract skilled professional management, ensure sufficient interest by the domestic banking sector and to enable the Fund to commence underwriting the risk of commercial credits, ii) providing sufficient liquidity to meet unexpected defaults, working capital to support treasury operations and generate income to cover operating losses as the company develops its business, iii) improve the rating of the Fund and facilitate co-financing by the Fund managers and/or strategic shareholders, iv) psychological impact of meaningful and visible support by the World Bank and GEF on investors, lenders, EMCs and host enterprises.

The objective of the GF is to maximize EMC project investments, through operation of its guarantee business, while generating sufficiently attractive rates of return on capital employed. The GF must be run on commercial terms, and should seek to i) preserve and grow its capital base by strictly controlling its cost structure, pricing risk correctly, charging appropriate fees and prudent treasury management, ii) adopt and adapt best international guarantee procedures and techniques to the extent permitted by China’s regulations, practices and evolving business conditions, iii) provide partial guarantees of up to 80 percent to encourage commercial credits at market related rates by its strategic banking alliances. The credits to EMCs and/or host enterprises will be made on the basis of independent application to the banks and on the strength of existing direct business relationships, clients’ business plans, specific projects, and/or collateral values.

Participating banks are being identified to work as strategic partners with the GF. The participating banks should assign specialized staff to work on the EMC support program, actively develop EMC relationships, generate deal flow, assess the quality of EMC business plans, management and collateral value, and, with the support of the EMC support group and targeted TA funds, extend their understanding of this new asset class and collect and disseminate market statistics relating to credit worthiness, default and recovery rates, guarantee fees etc. The GF will provide the banks with technical support, certified training programs, and promotional opportunity through working with the World Bank and GEF. The GF also will provide the participating Banks with priority referrals of new EMC clients and their corporate partners.

**GEF Technical Assistance Grant for the Guarantee Facility.** GEF grant resources of about \$2 million are necessary to support institutional capacity building, specialized training and initial set-up expenses of the GC and its partners. It is expected that this component will provide grant funds to the GF to specifically finance technical assistance to a) provide extensive GC staff training (US\$300,000); b) support the training needs, capacity building and monitoring/collections capacity of the participating banks (US\$500,000); c) provide initial operational support of GF administration, and access to and use of international advisors on the commercial operation of guarantee facilities (US\$450,000), d) research and prepare appropriate trust deeds, legal documentation, standard contracts and operational manual/procedures (US\$400,000); and e) provide for start-up costs of a new company or unit within an existing company (US\$350,000). A detailed Project Implementation Plan for this component is being prepared by Chinese counterparts, and will be appraised by the Bank, and suitably included in the final Project Appraisal Document (PAD).

**Figure 1. Structural Overview of Energy Efficiency Investment Program**



**Governance and structure of formal Agreements.** As the GF would be an independent entity, it will have its own supervisory board that will be responsible for setting policy, determining strategy, establishing operating procedures, remuneration and fees, and supervising the management company and holding it accountable for achieving the agreed annual plan. At the same time, however, the GF will be required to utilize the capital reserve created with GEF funds in strict accordance with a series of operational objectives, criteria and procedures established in the Contingent Grant Agreement with MOF and a Project Agreement with the World Bank. Construction of arrangements for the proper balance of control by the supervisory board and by the Government, through the different instruments, to both create incentives to meet the public and environmental objectives of the project, and to enable the GF to operate properly on commercial terms, will be one of the challenges of the final stages of project processing.

The Contingent Grant Agreement between the Government and the GF should govern the roles and responsibilities of GF in managing the contingent funds entrusted to it by the MoF and the specific conditions under which they are returned in whole or in part. In general, the agreement would cover the range of financial products (with provision for flexibility); credit and financial structuring criteria; a clear set of underwriting standards including limits on the size of individual exposures, maturity of exposure, default risk bands and borrower/industry concentrations; portfolio allocation, guarantee fees and return on investment targets; administrative policies and procedures, including risk management practices and reporting requirements; incentive compensation; and, boilerplate items such as representations and warranties, events of default, termination, indemnification, etc.

GF's senior managers will be subject to a management contract, which should specify the terms and conditions of employment; the mandate and responsibilities of the general manager; and the management remuneration structure, which should have financial incentives that reward managers should growth targets, budgets and return on investment targets be met or exceeded and penalize managers should these not be achieved.

Agreements with participating banks also will developed and implemented, establishing the terms of these long-term relationships, and the roles and responsibilities of both sides. For specific transactions, the GF and participating banks would typically complete "Guarantee Facility Agreements". Issues addressed would typically include structure of the guarantee, e.g., on parity; guarantee facility liability limit, and maximum principal amount of transactions which can be covered under the guarantee facility; the guarantee percentage, which may be expressed as a range with actual percentages to be determined case-by-case; guarantee fee pricing; timing of guarantee claim payment; parameters of the loans the bank makes which can be made subject to the guarantee, including loan amount (minimum/maximum), term, use of proceeds (including definition of EE); guarantee application and issuance process, i.e., defining the due diligence; that the guarantor will perform on each loan to be included under the guarantee; event of loss, which gives rise to the guarantee claims payment (which definition is typically tied to the definition of default in the underlying loan agreement between the bank and its borrower); and collections responsibilities and actions in event of default.

### Financial Products and Business Plan

**Financial products.** It is expected that the GF would provide parity guarantees to participating banks to cover up to 80% of the credit risk of eligible bank loans with tenors of up to three years and within strict underwriting guidelines defining the GF's exposure with respect to tenor, default exposure, loan size and concentration. This high rate of cover is driven by the bank's present risk aversion and regarded as necessary to induce a reasonable level lending whilst addressing the issues of moral hazard inherent in this kind type of operation. Currently, commercial Chinese banks are not accepting lower guarantee coverage. Although data supporting these limits are not readily available and will need to be verified at appraisal, initial assumptions for a preliminary base case model of the GF's operations over a ten year period are laid out in Table I. Once banks become accustomed to this type of lending, it is expected the GF will be able to reduce to the amount of cover offered and thereby increase the leverage of GEF funds and further reduce moral hazard inherent in underwriting bank credits.

**Table 2: Key Financial Model Assumptions for Financial Products**

Base Case <sup>1</sup>		Short-term	Medium-term	Long-term
Loan Tenor (yrs)		1	2	3
Average Loan size (\$)		500,000	750,000	1,500,000
Proportion of new guarantees written		10%	60%	30%
Proportion of Guarantees	– Baa <sup>2</sup>	40%	40%	40%
	– Ba	30%	30%	30%
	– B	30%	30%	30%
Guarantee Fee <sup>3</sup>	– Baa	2.1%	2.2%	2.2%
	– Ba	3.0%	3.5%	3.5%
	– B	6.6%	5.9%	5.6%
Default Rate	– Baa	0.16%	0.35%	0.40%
	– Ba	1.79%	2.64%	2.66%
	– B	8.31%	7.13%	6.50%
Recovery Rate <sup>4</sup>		48%	48%	48%
Recovery Expenses		3%	3%	3%

- Other key assumptions for the base case which are independent of the tenor of the loan are: initial GEF seed capital equals US\$24 million; the facility can implement a maximum of 40 loans per year; Technical Assistance and initial set-up costs of US\$2 million over the first three years, an evaluation/due diligence fee of 1.5% of amounts guaranteed and annual general and administration expenses of 2.7% of the initial fund size.
- Moody's equivalent risk level.

3. Includes 0.5% service fee on expected net losses.
4. Recovery rate refers to the expected recovery of claims made against the GC by the participating in respect of defaults on covered bank loans and will vary depending on the amounts of collateral and/or counter guarantees that are available to the EMCs

**Business Plan.** The Chinese and Bank project teams have conducted preliminary modeling of the guarantee program's possible operations, in order to assess the potential scale of the operations, key operational issues, and test assumptions on the main parameters of the business. As project preparation proceeds through per-appraisal, the key assumptions and business plan will be further refined. With the establishment of the GF before appraisal, more definitive business plans prepared by the new GF with its banking partners will form the basis for final project appraisal. Key assumptions and preliminary leveraging analysis are briefly described below.

*Guarantee reserves.* To commence the program, contributions to GF's reserves would include \$ 22 million in contingent grant funds from the GEF, and \$3.7-6.1 million in co-financing from the GF's managers or founding shareholders. With the GEF funds placed in a first loss position, it also may be possible to attract additional investors as the program matures. These reserves will be expanded through appropriate provisioning and be prudently managed and invested to enhance the credibility of the fund and its ability to meet all claims when they fall due.

*Guarantee pricing.* The principle for guarantee pricing should be aim to cover both operating costs and expected defaults, thereby allowing growth in income and capital preservation. Initially, however, guarantee pricing will be constrained by market conditions and existing practices and may need to start below appropriate levels, and increase as the business develops and the financial markets evolve. Guarantee prices in China now range from 0.8% per year to 3-6% per year, depending upon the company, its implicit credit rating and collateral value. In the base case analysis, it is assumed that guarantee fees will start at 1% pa of the outstanding credit exposure per year, and then rise quickly over the next five years to around 4-5% per year.

*Guarantee Capacity.* Guarantee capacity is the company's ability to deploy its reserves in terms of the magnitude of credit risk it is able to underwrite on behalf of the EMC sector. This Guarantee capacity is a key leveraging assumption and will depend upon it's the GC's financial structure, management structure, track record, credibility and investment policy. GEF seeks to maximize guarantee capacity from the capital reserve, aiming at guarantee commitments exceeding the capital reserve level from the first year onwards. Maximization of guarantee capacity is a key objective of the Bank, Government and GC, and will be aggressively pursued, in an attempt to attain levels of 3-5:1, if possible. However, guarantee leverage will be determined by the market, and hence cannot be assured or, at this point, accurately predicted. The base case analysis used for the estimates of project benefits and carbon dioxide savings is quite conservative, assuming a steady increase in the guarantee capacity to a ratio of \$2 of guarantee commitments per \$1 of capital reserve within the first five years of the project's operations. Even with this conservative assumption, the cost-effectiveness of the operation in terms of GEF net financing per unit of carbon abatement is still very high. Under more favorable conditions, sustained marketing and reasonable market acceptance, successful achievement of a level of 3 times the capital reserve within the first five years would result in an increase in the level of energy efficiency investments during the project implementation period from US\$251 million under the base case scenario to a total of US\$ 367 million or 17 times the size of the GET contingent grant.

*Additional leveraging factors.* Further leverage can be expected to result from the GFs strategy of addressing the moral hazard inherent in underwriting the risks of bank credit, and excessive leverage in the capital structure of industrial borrowers. The base case projections assume that i) the guarantees issued to the banking sector are limited initially to 80% coverage, declining to 65% as the market matures over the next 10 years as the banks become progressively less risk averse, familiar with this asset

class and more profit oriented, and ii) and loans granted by the participating banks under this program will be limited to 80% of the investment in energy efficiency investments.

*Default levels.* The expected rates of defaults and recovery of resulting losses can only be derived from extensive market statistics which are not available as yet in China. These key assumptions however have been estimated on the basis Moody's data derived in other markets. Preliminary analysis is based on default rates ranging from 0.2% to 6.5% per annum depending on tenor and estimated credit rating of borrowers. The aggregate default rate will be carefully managed and based on predetermined exposure limits with respect to tenor, credit rating, concentration and size of individual coverage.

Preliminary financial projections based on these and other assumptions, which will be developed further and verified during appraisal, indicate that significant resources could be mobilized by this program to develop the EMC sector in China. It is estimated that capacity to underwrite of around 70 % of the credit risk of an average of about US\$35million per annum of new bank credits could be established over a relatively short period of time. This in turn would generate cumulative commercial loans to the sector by the participating banks of US\$200 million over the project period of 7 years. Total direct investment of some 11 times the initial GEF contingent grant of US\$ 22 million could be achieved as a direct consequence of this program resulting in US\$ 251 million in new energy efficiency investments over this period.

**Table 3. Preliminary Leveraging Analysis**

<b>Year</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
Guarantee Issued in Favor of the Banks (\$ mil)	12.7	21.1	21.0	23.6	22.3	26.6	21.6	26.2	23.7	25.0
% of Bank Loans Guaranteed by GF	80	80	77	75	73	70	70	70	67	65
Loans Issued by Banks to EMCs (\$ mil)	16.0	26.3	27.2	31.5	30.5	38.1	30.8	37.4	35.3	38.4
Cumulative Loans	16.0	42.3	69.5	101.1	131.6	169.7	200.5	237.9	273.2	311.6
% Projects Financed by Bank Loans	80	80	80	80	80	80	80	80	80	80
Projects Financed (\$ mil)	20.0	32.9	34.1	39.4	38.2	47.6	38.5	46.8	44.1	48.1
Cum Projects Financed	20.0	52.9	86.9	126.3	164.5	212.1	250.6	297.3	341.5	389.5
GEF Leverage Ratio	0.9	2.4	4.0	5.7	7.5	9.6	11.4	13.5	15.5	17.7

## **Annex 4: Incremental Cost Analysis CHINA: GEF Energy Conservation II**

### **CONCEPT AND BARRIER REMOVAL STRATEGY**

Energy conservation in China over the coming decades remains critical for the country's development and for the global environment. Conservation efforts continue to be necessary to limit the otherwise huge increase in primary energy supply required to sustain the growth of China's economy and to mitigate the serious environmental consequences of expanded energy consumption. The Government has been particularly keen to develop the mechanism of energy performance contracting, which it considers to be a financing and technology dissemination instrument of great potential for China's evolving market economy. Efforts under the ongoing Phase I Energy Conservation Project have been successful so far in introducing and adapting energy performance contracting to Chinese conditions, developing a viable model in the three pilot EMCs, and establishing an initial market among client enterprises. However, despite the success of these three EMCs, parallel market activity has been slow to develop. Efforts are thus required to expand the three pilot EMCs to a national industry and seek participation of the third key player needed for a sustainable EMC market: banks and other financing institutions.

As described in the main text, Section B3, the main barriers constraining rapid new EMC development today include:

- Lack of sufficient awareness of the energy performance contracting and EMC concepts;
- Lack of knowledge and skills to operate EMC businesses;
- Lack of credit financing for EMC business development; and
- Difficulties in securing sufficient equity financing.

The proposed Phase II project is designed to help overcome these barriers to rapid development of China's EMC industry as efficiently as possible. Further more, in order to foster development of an EMC industry which is sustainable in the market on commercial terms, two additional objectives were set as requirement for project design: (a) direct grants to new or emerging EMCs should be avoided, and (b) the Chinese banking industry must be engaged as the key source of credit financing, replacing the donor financing in the demonstration phase.

As described in the main text, Section C1 and Annex 3, the project seeks to remove the main barriers to further EMC industry development outlined above by:

- Increasing nationwide awareness of the concepts, and provision of customized, intensive training and technical assistance for new and emerging EMCs on how to set up and develop their businesses, through the implementation of an EMC Service Component; and
- Establishment and implementation of an EMC Loan Guarantee Program, designed to provide new and emerging EMCs with enhanced opportunities to receive loans from domestic banks, and to engage the banks in the development of a sustainable EMC industry.

### **CONTINGENT FINANCE MODALITY**

About 85% of the proposed GEF financing will be used in a contingent finance modality. GEF financing proposed for this project includes (a) \$4.0 million in grant funds, including \$2.0 million in support of the EMC Service Group/Association's activities, and \$2.0 million to provide training and technical assistance to participating banks, and to partially defray the high start-up and initial transaction costs of the EMC

Loan Guarantee Program, and (b) \$22.0 million as a “contingent grant” to be used as a capital reserve for the EMC Loan Guarantee Program.

The concept of contingent grant financing is employed in this project to use GEF funds to backstop commercial bank loans to EMCs through provision of partial credit guarantees, rather than to provide direct grants to EMCs in need of financial support. In the first phase of the project, direct grants were provided to the demonstration EMCs to help support their first demonstration projects, as there was absolutely no experience with the investment mechanism in China, and no entities were willing to either form EMCs or accept commercial loan financing without some additional incentive, given the very high risks of trying this new mechanism out for the first time. As the concept has been successfully demonstrated in the three EMCs now, however, the Bank and SETC teams believe, based on market soundings, that the combination of customized technical assistance and credit enhancement through the guarantee program will provide sufficient support for the strong development of the EMC industry in the next few years, and additional direct grants to end users can be avoided. GEF involvement in the establishment of the guarantee facility is necessary, however, as no commercial investor is willing to undertake the perceived risks of financing the facility alone. This is because the EMC industry is still very new, with such a limited track record, and also because of the limited experience of guarantee funds in China to date. However, use of a contingent grant mechanism for GEF’s involvement is appropriate in this case, as there are excellent chances that the perceived risks in running the guarantee fund can be overcome over time.

The contingent financing modality for this project introduces several concepts, also used in the case of the Bank’s GEF Romania Energy Efficiency Project:

- *Concept of Gross Contingent Grant.* The initial GEF grant to support the capital reserve of the proposed EMC loan guarantee program is a gross grant (\$22 million proposed). The distinction between a conventional grant and this contingent grant is that the latter will be partially or fully returned to the initial beneficiary (e.g., MOF), or otherwise redeployed (e.g. perhaps for other types of guarantees), at the end of the project, for other uses in greenhouse gas reduction agreed with the Bank and GEF.
- *Final or Net Grant.* At the end of the project, as much of the contingent grant as possible will be redeployed for use in other agreed GHG mitigation projects. If the return is lower than expected because of factors directly linked to the performance of the Guarantee Company, it will be partially or fully converted into a conventional grant. (Sufficient incentives for maximum capital preservation by the Guarantee Company management will be a key part of the agreement establishing the capital reserve fund.) The amount which is not returned will be regarded as the Final Grant. While estimates have been prepared on the basis of reasonable assumptions and expected performance of the facility, the size of the Final Grant cannot be known with any precision until the project closes.
- *Incremental cost.* The incremental cost associated with the provision of the contingent grant for the capital reserve is equal to the difference between the future value of the Gross Grant and the money that is returned at the end of the project. Since the Final Grant will not be known until project closure, the incremental cost also will not be known until the project closing date.

The advantage of the contingent finance approach is its inherent capacity to match the net GEF grant with the actual incremental costs stemming from project risk. The incremental cost payments of the Final Grant will be limited to the amount required to actually overcome the barriers to sustainable commercial financing of the EMC sector and energy efficiency investments, as borne out during actual market conditions and project implementation. Overpayment of grant resources are thereby avoided for uncertain activities that are and initially considered to be risky, but ultimately able to yield commercial returns.

## **THE GEF ALTERNATIVE: GRANT AMOUNTS AND INCREMENTAL COSTS**

### **Baseline Scenario**

As described in Annex 2, some 68 new EMCs have been formed in China, in addition to the three demonstration EMCs. Based on the market reviews completed by the PMO to date (which will be further continued and expanded through project appraisal), the project team estimates that some \$53 million of investments might be undertaken by these and other new EMCs over the seven year proposed project implementation period, if no additional support measures are provided. These initial estimates are based on the current investment patterns of these companies, and assume that each EMC is able to complete about RMB 10 million of new business each year, with no growth over the first three years and 3 percent growth thereafter.

Although not insignificant, these estimates of possible new EMC investment levels under a without project scenario would be a very disappointing result given the market potential. Without a large-scale effort to provide additional financial security and industry know-how, local banks will continue to ignore the EMC business potential and, thus, starve prospective EMCs of required project financing to grow their businesses. There are few reasons for the local banks to undertake the major risks involved in lending to this largely unique business alone, unless good track records are first demonstrated. As can be seen today, despite the initial successes with the three pilot EMCs, new EMCs are extremely few in number and remain unable to access meaningful financing for large-scale operations. Thus, the baseline scenario would include very limited EMC market entrants and activity and participation by commercial lending institutions in this market would remain extremely low over the near- to medium-term. With the exception of a few financially strong investors, the EMC market would suffer from poor expertise and access to financing and thus the vast Chinese EMC market would remain largely untapped and unserved.

In addition, in the absence of a dedicated Association to market the EMC concept, help address ongoing policy issues (e.g., legal, taxation, verification), and train new EMC managers and staff, new EMCs are likely to run into considerable business development hurdles, which would further constrain their growth. Also, should new and inexperienced EMCs develop projects that fail or are poorly designed, it could have significant negative repercussions on the ability for the EMC industry as a whole to further develop.

### **Technical Assistance Components**

**EMC Service Component.** GEF grant resources of \$2.0 million are proposed to support about one-third of the costs of the EMC Service Group/Association's activities. This includes about \$600,000 to support EMC development and project monitoring and reporting. This support will enable the EMC Service Group to continue its customized support of the EMC industry begun with UK DfID support, and enable the Group to develop into a permanent EMC Association. By the end of the project period, the EMC Association will be self-supporting from its own revenue sources, gradually built up over time, such as member dues, service fees, and public support for special programs. This component is a necessary companion to the EMC Loan Guarantee Program, as it builds and strengthens the market for EMC loans. In some cases, however, some EMCs may have access to sufficient project financing (e.g., some power utilities or equipment suppliers), but require assistance to develop their EMC businesses. In many cases as well, the involvement in a major national program, supported by SETC, MOF the World Bank and GEF, provides a source of business legitimacy which is critical for gaining market credibility.

**Support for EMC Loan Guarantee Start-up.** GEF grant resources of \$2.0 million are proposed to help to defray the high initial start-up costs associated with the EMC loan guarantee program. These costs include development of initial products and in-depth marketing, staff training, use of international expertise on commercially oriented guarantee facilities, and the development and processing of the

program's first few transactions, which will be particularly labor-intensive. These costs also include a major program of technical assistance and training for the participating banks, to provide training and international expertise for the small specialized units which the participating banks are expected to develop for the program, and to sensitize the many branch officers who will be involved.

### **EMC Loan Program Contingent Grant**

**Gross Grant:** The minimum level of GEF contingent grant support to be used for the Guarantee Company's capital reserve is estimated at US\$ 22 million. Company shareholders are expected to provide an additional RMB 30-50 million (\$3.7-6.1 million) upfront, if a GEF commitment is forthcoming. This level of support is considered the minimum level based on estimates of both minimum market penetration and facility economies of scale. Given the size of the market, the guarantee program must have some size in order to make a noticeable impact. The financing package developed by the project team will enable the Program to back-stop loan financing for an average of about 10 EMC projects per year for about 20 EMCs. (For reference, the pilot EMCs have undertaken an average of about 20 projects per year each during 1999-2001.) Secondly, the Guarantee Program must have sufficient business volume to defray its fixed costs, such as overhead, core staffing, strategic partnership development with participating banks, etc. Based on the initial business model for the Program, GEF financing of at least \$22 million is necessary for the Program to achieve breakeven by about year 5.

**Final Grant.** The main factors determining the size of the final grant are those that determine the profitability of the Guarantee Program. Key factors include (a) ability to minimize transaction costs; (b) ability to minimize defaults; (c) the willingness of the market to accept guarantee fees which cover different risk profiles, and can properly defray evolving transaction and default costs; (d) the willingness of the market to accept guarantee commitments at multiples of the capital reserve; and (e) interest gained from the Guarantee Program's reserves.

The final grant will be equal to the contingent grant of US\$22 million less the final book value of the portfolio of investments made by the guarantee company (cash balance plus investments less trade creditors and the amounts attributable to the equity shareholders). While the exact amount of the final grant will not be known until project closure, preliminary and conservative analysis shows that under reasonable assumptions and continued reforms of the Chinese financial system, it may be on the order of US\$1.1 million (in addition to the technical assistance grant for start-up of \$2.0 million). Preliminary sensitivity analysis in Table 1 below show that the level of the final grant show assumptions which lead to estimates of final grant amounts ranging from zero to about US\$3 million.

**Table 1: Preliminary Sensitivity Analysis of Selected Parameters**

<b>Parameter</b>	<b>Estimated Final Grant<sup>1</sup> (US\$ million)</b>	<b>Total Investments Generated<sup>2</sup> (US\$ million)</b>
Base Case (refer Table 1 in Annex 4)	1.1	251
Capital to Guarantee Leverage – increase by 30%	1.2	320
Capital to Guarantee Leverage – decrease by 30%	1.1	185
Guarantee Fee – decrease by 30%	2.9	243
Guarantee Fee – Increase by 30%	0	259
Start-up Costs – Increase by 30%	1.9	239
Default rate - increase by 30%	1.5	248
Overhead costs – increase by 30%	2.5	243
Interest Earned on Funds Invested	3.1	239

1. Excluding initial start-up grant of US\$2.0 million.

2. Cumulative investments made over the 7-year life of the project.

The Contingent Grant Agreement between MOF and the Guarantee Company must include provisions which align Company returns from the program to achievement of two key objectives: (a) the back-stopping of a maximum amount of EMC investments through provision of loan guarantees, and (b) maximum preservation (and even growth, if possible) of the capital reserves provided with GEF resources.

#### **Incremental Cost of the GEF Alternative**

The incremental cost of the project is equal to the cost of the grant technical assistance of \$4.0 million, plus the final grant amount resulting from the contingent grant for the capital reserve of the EMC Loan Guarantee Program, which will not be known until project closure (see Table 2). If the final grant amount of the contingent grant were \$1.1 million, than the total incremental cost of the project would be \$5.1 million (excluding the time-value of the capital reserve funds).

**Table 2. Incremental Cost Matrix**

	<b>Baseline</b>	<b>GEF Alternative</b>	<b>Increment</b>
<b>Domestic Benefits</b>	<ul style="list-style-type: none"> <li>Limited project investment by a few new EMCs</li> <li>Limited banks engaged in EMC financing</li> <li>Some EMC business failures</li> </ul>	<ul style="list-style-type: none"> <li>Major increases in EMC activity from Association and training programs</li> <li>Provision of loan guarantees from GF</li> <li>Large-scale awareness of EMC business and potential</li> </ul>	<ul style="list-style-type: none"> <li>Removal of EMC informational and financing barriers</li> <li>Additional energy savings of 52 million tce</li> <li>Significant development of EMC industry framework</li> </ul>
<b>GLOBAL ENVIRONMENTAL BENEFITS</b>	Reductions in GHG based on low level of EMC investment.	Reductions in GHG based on high level of EMC investment.	34 million tons of carbon reduced.
<b>Costs by Component (US\$M)</b>			
New EMC Investment <sup>1/</sup>			
EMC Association	53	303	197
Guarantee Company	0	3.5	3.5
	0	27.7	27.7
<b>Total Costs</b>	53	334.2	281.2
UK DFID Contribution	2.5	2.5	2.5
<b>GEF Incremental Costs (US\$M)<sup>2/</sup></b>			4.0+

Note: All figures will be subject to confirmation at project appraisal.

1/ Excludes investment by three demonstration EMCs supported in first project phase.

2/ The minimum incremental cost, assuming deployment of all of the \$22 million of contingent grant funds and no accounting for the time value of these resources is \$4.0 million. The maximum theoretical incremental cost is \$26.0 million, which assumes no redeployment of any contingent grant resources.

### **THE GEF ALTERNATIVE: LEVERAGING, ENERGY SAVINGS AND GHG REDUCTION BENEFITS**

#### **Project Benefits: Energy Savings & Carbon Dioxide Emission Abatement**

The direct benefits of this project are the energy savings from the expanded EMC energy efficiency investments, and the associated carbon dioxide emission reduction (as well as reduction of local pollutants). Energy savings actually achieved in this project can and will be closely monitored and reported, because (a) actual energy savings are central to the energy performance contracting mechanism of the EMCs, (b) EMC investment levels can be closely tracked by the EMC Service Group, as a direct result of the Guarantee Program and other reporting from the Group's members.

Based on data from the first 141 projects implemented by the three demonstration EMCs, the average total energy savings gained per \$1000 invested in energy efficiency projects using energy performance contracting equates to 117 tons of coal equivalent (tce). This results from an average of 12.71 tce saved per year per \$1000 invested, and an average estimated equipment lifetime for the types of equipment used

of 9.2 years. The associated carbon emissions reduction equates to 78 tons of carbon per \$1000 invested for the average fuel mix saved in these 141 projects.

Direct energy efficiency investments resulting from the EMC Loan Guarantee Program are estimated at about \$250 million over the seven-year project implementation period, based on very conservative estimates of the willingness of the market to accept guarantee commitments in excess of the Guarantee Company's capital reserve (see Annex 3). With commercial success, however, it is expected that the Guarantee Program may continue after the end of the project, with a GEF exit strategy whereby other investors buy-out the GEF share of the Guarantee Company's dedicated capital. Over a ten-year time slice, the project team's initial model projects that the Guarantee Program can support a total of \$390 million in EMC energy efficiency investments, using similar conservative assumptions. This level of investment equates to 46 million tce of energy savings, and 30 million tc of reduced carbon emissions over the ten-year period.

The EMC Service Component is necessary for the Guarantee Program to be effective, and it therefore also contributes to the above benefits. In addition, however, the EMC Service Component will result in substantial additional energy efficiency investments by EMCs which do not need to use the Guarantee Program, but have expressed strong needs for technical assistance and programmatic support. The project team estimates that such investments may reach some \$75 million over the projects 7-year implementation period, and some \$120 million over a time-slice of ten years. This equates to an additional 14 million tce of energy savings and 9 million tc of reduced carbon emissions over the ten year period.

Subtracting energy savings and carbon dioxide emissions reductions resulting from the estimated \$53 million of EMC investment that may take place over the seven-year period in the absence of the project (perhaps also some \$70 million of investment over the ten year period), the total net project benefits equate as follows:

- (a) \$272 million of new energy efficiency investment, resulting in 32 million tce of energy savings and 21 million tc of carbon emissions reduction over the seven years of project implementation; and
- (b) \$440 million of new energy efficiency investment, resulting in 52 million tce of energy savings and 34 million tc of carbon emissions reduction over ten years.

### **Leveraging of GEF Funds**

As a second phase operation designed to reap the benefits of the initial demonstration operation, and a project designed for maximum leveraging of GEF resources through contingent financing, the leverage of GEF funds in this Phase II operation will be extremely high. The following calculations are demonstrative:

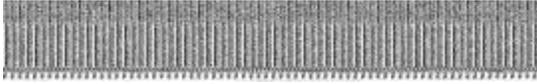
- (a) Based on the conservative assumptions described briefly in Annex 3, the Guarantee Program should be able to support energy efficiency investments by EMCs at a ratio of at least 11:1 over the seven year project life, especially due to 1-3 year tenure of the guarantees and the revolving nature of the fund. Over ten years, this ratio is forecast to rise to about 18:1.
- (b) Adding in projected additional investments resulting from the EMC Service Component's activities, but subtracting investments from the baseline scenario, energy efficiency investments per unit of GEF gross grant resources, including grants in addition to the contingent grant, are 10:1 over the seven-year project implementation period and 17:1 over ten years.

- (c) Considering the return of contingent grant resources at the end of the project, to be redeployed for additional, other GHG reduction activities, the ratio of net or final GEF grant investment by the end of the project to energy efficiency investment levels are very high. Assuming a final GEF grant of \$4 million—the minimum level—the ratio of energy efficiency investments to GEF final grant investment is 68:1 over seven years, and 110:1 over ten years. Assuming a final GEF grant of \$8 million (eg. capital reserve losses of \$4 million), the ratio of energy efficiency investment to GEF final grant investment is 34:1 over seven years and 55:1 over ten years.

**Grant cost effectiveness.** The net cost of carbon abatement of this Phase II project is a direct corollary of the leverage figures presented above. Assuming ten years of benefits, the gross grant cost of carbon abatement is about 76 US cents/ton of carbon, but the net grant cost of carbon abatement is projected at some 12-24 US cents/ton of carbon, assuming final grant amounts of between \$4 million and \$8 million as in (c) above.

The GF will highly leverage the initial GEF seed capital to the maximum extent possible within prudent limits and will include a clear set of underwriting rules limiting guarantees to 80% of loans and requiring initial equity contributions of some US\$3.6 million from strategic corporate investors by reinvesting its surplus fee and interest income. With financing contributions of US\$24 million by GEF and an estimated US\$3.7 million in initial equity, a total of US\$251 million in energy efficiency investment is estimated to be generated through GF operations over a seven year life of the project. The initial GEF money will thus be reinvested some 11 times over the project life of 7 years. In addition to GF investments, it is expected that the project will generate significant market activity over time through the technical assistance component and initial GF customers that make new investments without further GF support. A conservative estimate, assuming an initial GF market share of 80% (of total EMC investments) and decreasing 3% per year, would be that total EMC investments over the seven year project period would reach more than US\$548 million, providing substantial further leverage of GEF contributions.

**Annex 5A STAP Roster Technical Review  
CHINA: GEF Energy Conservation II**



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September 27, 2001

Mohammad Farhandi, Director  
Energy and Mining Unit  
East Asia and Pacific Region  
The World Bank  
1818 H Street, NW  
Washington, DC 20433

Re: China Proposed GEF Energy Conservation II Project (ID P067337)

Dear Director Farhandi:

Attached is the written opinion you requested providing an independent review of the China Proposed GEF Energy Conservation II Project (ID P067337). In 1996, I reviewed a Draft Project Information Document for the first phase of this project and reported as follows:

"My overall opinion of the China Energy Conservation Promotion Project is that it is an effective use of \$35 million of the GEF. The purpose of the project, to create an industry in China that will provide energy efficiency services with the savings shared between the energy efficiency provider and the company that is saving the energy, is an exciting one. There is a powerful need at this time to find and support new ways to keep energy efficiency alive and well in China. This project has the potential to stem a dilution-of-mission within the extensive network of energy efficiency service centers that exist throughout the country and refocus their attention to the mission of promoting energy efficiency

The task is a formidable one. The establishment of an energy service industry and the institutional development of performance contracting are a challenge in any country. The developers of this Project Information Document appear to have considered the important elements of such an endeavor. At the same time there are a number of concerns that need to be addressed to enhance the case for the project succeeding. If the concepts and specifications stated in the Project Information Document and elaborated upon below are incorporated into the preparation of the project and subsequently into the business plans of the Energy Management Companies, the project is likely to achieve its stated goals. If it does, the savings in greenhouse gas emissions will be significant. "

A year later I reviewed an updated Project Information Document and again supported the project:

"A year ago I reported in my evaluation of this project that 'the project has dramatic medium and long-run potential for reducing carbon emissions'. Based on both the new Project Information Document you sent this past week and the verbal clarification you provided at our meeting, I can safely say that this continues to be true. The savings potential looks as great as it did a year ago and the project itself appears to be on dramatically more solid footing due to significant achievements over the past year."

My review of the current Project Concept Document of the China GEF Energy Conservation II Project makes me pleased with my earlier assessment. The Concept Document shows clearly that the first phase of the project has avoided the many pitfalls identified along its moderately risky course and has achieved the basic objectives it set out to achieve. This second phase Project Concept Document clearly identifies needed next steps in the process, ones that appear to me to be noticeably less risky than the ones faced at the project outset

Paraphrasing my original assessment, I can safely say that the developers of the current Project Concept Document appear to have considered the important elements of such an endeavor. The accomplishments of the first four years of this project allay the most important concerns that were faced at the project's inception. The current Project Concept Document lays out a clear and rational approach to overcoming the remaining barriers. If the concepts and specifications stated in the Project Concept Document and elaborated upon in my opinion attached below are incorporated into the preparation of the project and subsequently into the business operations of the EMCs, the EMC Service Group, and a new EMC Loan Guarantee Company, and assuming that a series of suggestions for minor wording clarifications and inconsistency corrections that I verbally passed off to Bob Taylor earlier today are attended to, the project is highly likely to achieve its stated goals. If it does, the savings in greenhouse gas emissions will be significant.

I appreciate the opportunity to help the World Bank in developing its portfolio of loans to stimulate greenhouse gas mitigation in China. I'm greatly enthusiastic over the remarkable public benefits I expect from this project.

With warm regards,

Stephen Wiel

**Opinion by Stephen Wiel**  
**On "China GEF Energy Conservation II"**  
**Project Concept Document**  
**September 4, 2001**

**Summary**

My overall opinion of the China GEF Energy Conservation II Project is that it is an effective use of \$26 million of the GEF. The purpose of the project, to create an industry in China that will provide energy efficiency services with the savings shared between the energy efficiency provider and the company that is saving the energy, is an exciting one. There still exists the powerful need that was identified at the beginning of this project to find and support new ways to keep energy efficiency alive and well in China. This project has the potential to further advance the play of market forces and facilitate the development of market-based initiatives in China's energy conservation system. It alleviates barriers to energy efficiency in a way that strategically complements other elements of the overall EC/GEF/IBRD China Energy Conservation Project.

The task of creating a vibrant Energy Management Company (EMC) industry is a formidable one. The establishment of such an industry and the institutional development of performance contracting are a challenge in any country. The progress in China over the past four years in establishing three Energy Management Companies (EMCs) and an incipient EMC Service Group is strongly encouraging and lays to rest several major concerns about the applicability of performance contracting to the Chinese marketplace that existed at the initiation of the project. The concept has been successfully demonstrated. There remains now only broad institutionalization to foster the expansion of the concept to everyday business practice -- a venture that still carries risk, but one much less daunting than that faced five years ago.

Furthermore, the developers of this Project Concept Document appear to have considered the important elements for the continuation of this endeavor. They have focused on the most important next steps -- training and technical assistance to the EMC and banking industries and EMC loan guarantees for inducing the participation of the financial community. They have designed an innovative use of contingent funding to provide loan guarantees to EMCs (rather than grants) in a way that is most likely to foster a robust and sustaining EMC industry. If the concepts and specifications stated in the Project Concept Document and elaborated upon below are incorporated into the preparation of the project and subsequently into the business operations of the EMCs, the EMC Service Group, and a new EMC Loan Guarantee Company, the project is highly likely to achieve its stated goals. And if the project goals are achieved, the increased savings in greenhouse gas emissions will be enormous.

**EMC Service Component**

The EMC Service Component is "designed primarily to provide in-depth, practical technical assistance to new and emerging EMCs on development of their businesses". Its near-term and medium term work programs are described in Annex 7 and contain at some level all of the elements useful for accomplishing the stated objectives. It seems to me from reading this section of the concept document that the focus will be primarily on the business and financial aspects of the industry. For example, the training element of the near-term work program provisionally includes "courses on (a) EMC corporate structuring and business operations in the Chinese market (for company management), (b) energy performance contract project development and management under Chinese conditions (for project and operations managers), (c) EMC financial management according to Chinese laws and practices (for company and financial managers), and (d) clinics/workshops on pressing issues, emerging opportunities." The other elements in the near-term work program are a) Raising awareness of the banking sector, b) Review of EMC business

opportunities, c) Partnership development, and d) EMC business marketing. These all are important aspects of technical assistance needed to expand the EMC industry.

My expectation is that the members of the EMC Service Group will also want a significant amount of engineering and technology training and information sharing. While I can read a technology aspect into the current words if I try, I believe the project would be strengthened to include a clear and explicit charter in the Project Concept Document for the EMC Service Group to apply a noticeable portion of its total \$4.5 million (including \$2 million of GEF funds) to engineering and technology training, information sharing, and other such activities, as interest and circumstances dictate. Most likely, this would enable the EMC Service Group to better serve its constituency by engaging a broader participation of individuals from within the EMCs, stimulating more creative technical thinking within the industry, attracting a stronger employee base for the EMCs, and stimulating a more rapid creation of new EMCs.

### **EMC Loan Guarantee Program**

A new EMC loan Guarantee Company (GC) will be established under the project in China and operated on a commercial basis "to enhance the ability of EMCs to obtain commercial loan financing from domestic banks". \$22 million would be provided to create a capital reserve to cover some of the risk of the EMCs and \$2 million of the funds proposed for this venture are slated "to support the start-up costs of the GC, including extensive staff training, use of international advisors on the commercial operation of guarantee facilities, and provision of technical assistance and training to participating banks". Two aspects of this plan are worth commenting upon here.

First, the training to banks is of considerable importance to the project. This fact is reinforced in the EMC Service Component work program, which includes raising awareness of the banking sector as a significant element, and says, "This work will be coordinated with more intensive technical assistance efforts for several specific banks to be conducted by the proposed Guarantee Company." The current language in the Concept Document would appear to allow the GC to allocate as much of the \$2 million to staff training and advisors on the commercial operation of guarantee facilities and as little to technical assistance to the banking industry as it seem fit. Perhaps it would be worthwhile for the Bank to be more explicit about the importance of the bank assistance portion of this work and to retain more control of the GC's allocation of these funds.

Second, the amount of guarantee funds remaining at the end of the seven-year project period is unknown but is expected to be on the order of \$20 million. The Concept Document provides that "Upon project completion, remaining funds should be returned to the Government for reallocation for other greenhouse gas abatement projects agreed with the GEF and the Bank following procedures defined in the Grant Agreement." We can't know today what might be the best or even appropriate use of these funds seven years from now. If progress on the project is slower than anticipated, perhaps the best use of the funds will be the continuation of loan guarantees for the EMC industry. Might it not be better to retain more control over the application of the remaining guarantee funds at project completion rather than simply turn control over to the Chinese Ministry of Finance? Including a more explicitly specified process for determining the destiny of these funds seems worthwhile.

### **Miscellaneous**

It would have been useful for my review and therefore might be useful for other users of the Project Concept Document to see more graphical display and other visualization techniques. This applies especially to financial projections and timelines, which were sometimes hard to glean from the text and tables.

**Annex 5B World Bank Team Response to STAP Reviewer Comments  
CHINA: GEF Energy Conservation II**

The STAP Reviewer's comments can and will be fully incorporated in the project and its final documentation. The Bank team agrees that the EMC Service Group's should include technical training, information sharing and other such activities on technology. Some of this work can also be supported through the SETC's Energy conservation Information Dissemination Center, also supported by the GEF under the first phase of the China Energy conservation Project. The team strongly endorses the proposal to give more explicit attention, including a dedicated budget within the existing TA components, to the provision of technical assistance to the banks, especially those involved with the guarantee facility. The team also is planning to further develop and specify the exit strategy for the project. Finally, the team agrees to include more graphic display and other visualization techniques in the final documentation.

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