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PROJECT BRIEF
ON A
PROPOSED LOAN
IN THE AMOUNT OF US\$200 MILLION
AND A
PROPOSED GRANT FROM THE
GLOBAL ENVIRONMENT FACILITY TRUST FUND
IN THE AMOUNT OF US\$13.5 MILLION
TO THE
PEOPLE'S REPUBLIC OF CHINA
FOR A
CHINA ENERGY EFFICIENCY FINANCING PROJECT

March 23, 2006

Transport, Energy and Mining Sector Unit
Sustainable Development Department
East Asia and Pacific Region

CURRENCY EQUIVALENTS

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Currency unit = Renminbi (RMB) Yuan (Y)
Y 1.0 = US\$0.13
US\$1.0 = Y 7.74

FISCAL YEAR

January 1 – December 31

ACRONYMS AND ABBREVIATIONS

BP	Business Procedure	IBRD	International Bank for Reconstruction and Development
CDB	China Development Bank	IFC	International Finance Corporation
CHUEE	IFC/GEF China Utility-Based Energy Efficiency Project	MOF	Ministry of Finance
EUEEP	China End-Use Energy Efficiency Project	Mtce	Million tons of coal equivalent
CO ₂	Carbon dioxide	NDRC	National Development and Reform Commission
EIA	Environmental Impact Assessment	NECC	National Energy Conservation Center
EIRR	Economic internal rate of return	OECD	Organisation for Economic Co-operation
EMC	Energy management company	OP	Operations Procedure
ESCO	Energy service company	PFI	Participating financial intermediary
ExA	Executing agency	PMO	Project management office
Exim	China Export and Import Bank	SO ₂	Sulfur dioxide
FI	Financial intermediary	UNDP	United Nations Development Programme
FIRR	Financial internal rate of return	VSL	Variable spread loan
GDP	Gross domestic product	WTO	World Trade Organization
GEF	Global Environment Facility		
GHG	Greenhouse gas		
GOC	Government of China		
IA	Implementing agency		

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EAST ASIA AND PACIFIC
China Energy Efficiency Financing

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A. STRATEGIC CONTEXT AND RATIONALE

Country and Sector Issues

1. China is the second largest energy user and emitter of greenhouse gases (GHGs) in the world. Energy consumption in China has increased 5.8 percent annually since 1990—more than three times faster than the rest of the world—rising from 990 million tons of coal equivalent (Mtce) in 1990 to 2,442 Mtce in 2006. Despite the unprecedented growth, China's per capita energy consumption is still less than one fifth of the OECD average, with significant room to grow as the economy continues to expand rapidly. If left unchecked, China's energy demand, primarily met by coal, will soon reach a level that will significantly increase local air pollution and the risk of climate change. Improving energy efficiency holds one of the keys to sustaining China's economic growth with reduced energy needs and lessened environmental impacts.
2. China's energy efficiency lags far behind the world's most efficient economies, especially in manufacturing industries. Its energy-intensive manufacturing industries, accounting for about 50 percent of total final energy consumption, operate at significantly higher levels of energy intensity (energy use per unit of physical output) than international best practices. For example, the average energy intensities of raw steel, synthetic ammonia, and cement production at medium and large-sized facilities in China are, respectively, 22, 37, and 40 percent higher than international best practices.¹ The significant potential for conserving energy and reducing GHG emissions are largely untapped in these industries.
3. The Government of China (GOC) has stepped up its efforts to improve energy efficiency. In November 2004, the National Development and Reform Commission (NDRC) issued the nation's first Medium and Long Term Energy Conservation Plan (2005 to 2010 and 2020), which highlighted 10 energy conservation programs targeting the country's major energy-consuming sectors. In the nation's Eleventh Five-Year Plan for Economic and Social Development, endorsed by the People's Congress in March 2006, the GOC has pledged to reduce the energy intensity of gross domestic product (GDP) by 20 percent from 2005 to 2010, with implicit energy savings of about 560 Mtce annually by 2010. The NDRC launched the "1000 Large Industrial Enterprises Energy Conservation Action Plan" in April 2006, targeting the top 1,008 largest industrial energy consumers, which account for approximately 30 percent of China's total primary energy consumption. The government efforts also include policy initiatives to foster technology development and deployment, and to provide various fiscal incentives for energy efficiency improvements.
4. The estimated energy conservation investments needed to achieve the 20 percent energy efficiency target surpass US\$50 billion—most of them in industries.² Although Chinese experts agree that the majority of the identified industrial energy conservation investments are financially viable, most of the concerned enterprises are unwilling to finance energy conservation projects from internal resources, which they focus on business expansion. Nor have such investments attracted the attention of the domestic banking sector. In 2006, the first year of the 11th Five-Year Plan, the energy intensity of the GDP was not reduced partly because of

¹ State Development and Reform Commission, Mid and Long-term Energy Conservation Plan, 2004.

² Chen Hongwei, November 23, 2006. *Economic Daily*.

continued heavy bias toward expansion-led industrial investments. Accelerating the efforts to promote industrial energy conservation investments has taken on increased urgency.

5. There is a large financing gap for energy conservation investment in medium and large-sized industrial facilities,³ which normally costs US\$5–30 million per project. The existing industrial energy conservation investment financing mechanisms have mainly benefited relatively small projects, usually under US\$1 million. In fact, the Bank's First and Second China Energy Conservation Projects, funded by the Global Environment Facility (GEF), have been credited for the development of China's energy services industry. The energy management companies (EMCs)⁴ supported by the two projects made US\$245 million worth of investments, many of them in the industrial sector, in 2005. However, few of the EMC investments exceeded US\$1 million. Another ongoing project, the IFC/GEF China Utility-Based Energy Efficiency Finance Program, also supports industrial energy conservation investments. It promotes installation of more energy-efficient equipment through energy utilities with commercial bank financing backed by a guarantee facility. Again, these investments are small, often about US\$0.5 million.

6. Before the late 1990s, public funds were the primary financing source for medium and large-sized industrial energy conservation projects, including the central government's dedicated energy conservation funds channeled through state-owned banks, and local government counterpart financing. Since then, the GOC has gradually eliminated public funds earmarked for industrial energy conservation project financing, expecting that Chinese banks would build energy conservation lending business lines, given the economic and financial attractiveness of such projects. This expectation has not materialized. There are many reasons why the lending market for medium and large-sized industrial energy conservation investments has remained essentially undeveloped, compared to its large potential. The main impediments include the following:

- Perceived high technical and financial risks by industrial enterprises.
- Perceived high financial risks of industrial energy conservation lending among Chinese banks.
- Insufficient institutional capacity, especially at the national level, to address the pressing needs of scaling up energy efficiency investments.

7. ***Perceived high technical and financial risks by industrial enterprises.*** Compared with small industrial energy conservation projects, which often involve simple replacements or upgrades of equipment and have very short payback periods (one to two years), medium and

³ The size of an energy efficiency investment is defined by the estimated investment cost of a single energy-efficient technology intervention. The targeted energy efficiency investments of the proposed project range from about US\$5 to 25 million, compared with small sized investments of about US\$1 million or less. The size of an industrial enterprise is defined by revenue. According to China State Statistical Bureau (2003 guideline), the annual revenue of an medium enterprise is in the range of RMB30 to 300 million yuan, and that of a large enterprise is at or above RMB300 million yuan. The proposed project will primarily focus on three energy intensive industries: iron and steel, cement, and chemicals.

⁴ EMCs are the Chinese equivalence of energy service companies (ESCOs) in North America. These companies finance energy conservation projects of the clients and share the benefits of energy savings with the clients based on the performance of the energy conservation projects.

large-sized projects typically are technically more complex—sometimes involving unfamiliar technologies and optimization of production processes—require longer payback periods and have no solid track record of reliable financial returns. Such types of energy conservation projects also tend to pose a higher risk of disrupting normal business operations, leading to lost production and revenues. These characteristics usually lead to significantly higher hurdle rates of returns for energy conservation investments, compared with new capital investments. Without easy access to commercial finance or regulatory pressure, enterprises often defer or abandon major investments in energy efficiency improvements in favor of production expansions, which fit well with the general growth pressure in the Chinese economy.

8. ***Perceived high financial risks of industrial energy conservation lending among Chinese banks.*** Compared to production expansion projects, energy conservation projects usually do not directly generate additional revenues, but rather contribute to a reduction in energy expenditures. This makes it difficult for the banks to identify cash flows from the projects as hard assets with sufficient market values to adequately justify loans. Chinese banks are not familiar with industrial energy conservation practices, nor do they have the internal capacity to properly evaluate their risks and benefits. The perceived transaction costs of industrial conservation projects are also high because the variety of energy efficiency technologies would complicate project preparation, appraisal, and supervision, as well as reduce repeat businesses. These perceptions lead banks to believe that industrial energy conservation projects constitute unduly high financial risk, preventing the banks from either offering attractive financing terms to such projects or developing specialized industrial energy conservation lending business.

9. ***Insufficient institutional capacity, especially at the national level, to address the pressing needs of scaling up energy efficiency investments.*** In the wake of the great expansion of energy-intensive industries in the last 10 years or so, the government's capability to effectively implement its energy efficiency policies and programs has declined considerably in relative terms. Given the size and large weight of the energy-intensive industries in China's economy, as well as the widespread inefficient practices among their major facilities, policy and regulatory interventions need to be strengthened significantly to encourage industrial enterprise to undertake energy efficiency investments.

Rationale for Bank Involvement

10. China's rapid ascendance to world manufacturing powerhouse has not been accompanied by a transition of its industrial sector to world-class energy efficiency. The sharp increase in coal consumption since 2001, driven by surging demand in power generation and energy-intensive industries, has helped drive up the energy intensity of the economy, reversing a descending trend of more than 20 years. This has heightened the urgency in the government to accelerate and scale up energy efficiency policy interventions. With intensified government efforts on energy conservation during the 11th Five-Year Plan period and a large stock of energy-inefficient industrial capital offering good efficiency investment returns, there is a window of opportunity to scale up energy efficiency investments in medium and large-sized manufacturing facilities in the next few years, creating an impetus for mainstreaming the energy conservation lending business in the Chinese banking sector. This will require a two-pronged approach by demonstrating viable business models for industrial energy conservation financing at the domestic bank and enterprise level and by strengthening the enabling policy framework. The Bank is uniquely positioned to

provide the GOC with this support, given its close working relationship with the GOC during the last two decades, successful experience in integrating technical assistance and lending operations with the GOC's policy agenda, and its global energy efficiency financing experience.

11. The Bank is implementing the GEF-funded First and Second China Energy Conservation Projects to support commercially viable energy conservation projects by introducing an energy performance contract mechanism through EMCs. The EMCs have been especially successful in arranging financing for small energy conservation projects, but are not positioned to break into the market segment for medium and large-sized industrial energy conservation projects. The IFC/GEF China Utility-Based Energy Efficiency (CHUEE) Project also has a similar limitation in addressing the financing needs of medium and large-sized energy conservation investments. The proposed project is requested by the NDRC and the Ministry of Finance (MOF) and is considered by the GOC an important follow-up to the First and Second China Energy Conservation Projects. The proposed project will broaden the scope and increase the scale of industrial energy conservation investments, primarily targeting medium and large-sized energy-intensive manufacturing facilities, often referred by Chinese experts as “goldmines” of energy savings because of relatively significant energy savings per project.

Higher-Level Objectives to Which the Project Contributes

12. The objectives of the proposed project are fully consistent with the Country Partnership Strategy for 2006–10 (Report No. 35435-CN), approved by the board on May 23, 2006. It directly supports a major pillar of the Country Partnership Strategy for China: *managing resource scarcity and environmental challenges*. It will also contribute to the Bank's recent efforts of developing a new investment framework to promote clean energy and energy efficiency by exploring effective ways of incorporating carbon finance and GEF technical assistance into the Bank's lending operation in China. In addition, the proposed project would support the World Bank Group corporate commitments of increasing renewable energy and energy efficiency lending support to clients by at least 20 percent per year during 2005–10.

13. The proposed project, if implemented successfully, will significantly increase commercial financing for medium and large-sized industrial energy conservation projects in China. This will strongly support the GOC's strategy to improve the energy efficiency of the energy-intensive industries.

B. PROJECT DESCRIPTION

Lending Instrument

14. The Bank financial product chosen for the project is a [variable spread loan (VSL)],⁵ with a term of 17 years, including a grace period of up to 4 years [*to be agreed during appraisal*]. The key factors guiding the MOF's decision to choose this product are based on the preferences and

⁵ VSLs are available in EUR, JPY, USD and other currencies which the IBRD can efficiently intermediate. The lending rate for VSLs is tied to six-month LIBOR in each loan currency and is reset semiannually. The spread is a pass-through to borrowers of the IBRD's weighted average cost margin relative to 6-month LIBOR for funding allocated to these loans, and is recalculated semiannually. The repayment terms for VSLs are based on country criteria.

asset-liability management strategy of selected participating financial intermediaries (PFIs). The Bank loan will be passed through the MOF to eligible PFIs, on the same terms and conditions. PFIs will in turn relend these funds, at market rates, to industrial enterprises for medium and large-sized energy conservation investment subprojects, according to their own lending policies and procedures, complemented by the requirements of operational manuals, and agreed with the Bank during appraisal and negotiations. The operational manuals will define the eligibility criteria of energy conservation subprojects to be financed by PFIs, as well as economic, financial, technical, environmental, and social due diligence requirements.

Project Development Objective and Key Indicators

15. The project development objective of the proposed project is to improve the energy efficiency of medium and large-sized industrial enterprises, and to reduce their impact of climate change. The project development objective will be achieved by (a) developing sustainable energy conservation lending businesses in selected banks to support energy conservation investments in medium and large-sized industries; and (b) strengthening government capability to enforce related laws, regulations, and standards, and to supervise and monitor energy efficiency-related activities.

16. The key performance indicators of the project will be a reduction of average energy intensity achieved by large enterprises in energy-intensive industries and the associated reduction of carbon dioxide (CO₂) emissions (details in Annex 3).

17. The main outcomes of the proposed project will be (a) USD 400 million of energy efficiency financing provided by the PFIs to medium and large-sized energy-intensive industries for energy efficiency investments; (b) Additional USD 150 million of energy efficiency investment financing request in the pipeline of Chinese banks participating in the project, (c) energy efficiency financing preparation procedures and modalities adopted by Chinese banks participating in the project, and (d) a fully-functioning National Energy Conservation Center established. The project will include a complete system for monitoring achievements on performance indicators and intermediate outcomes.

Project Components

18. ***Component A: Promotion of Energy Efficiency Financing (estimated cost: US\$16.65 million; US\$9.9 million of GEF cofinancing).*** The proposed activities will remove key barriers to developing energy conservation financing businesses in the domestic banking sector primarily for medium and large-sized industrial energy conservation investments. They comprise:

(1) *Assistance to participating financial intermediaries (PFIs)* for IBRD loan onlending in (a) business startup, including creation, organization, staffing, and initial business plan of the energy conservation lending business unit (or team); (b) capacity building and training, including development of necessary internal mechanisms, procedures, and adequate knowledge base to evaluate and extend loans to industrial enterprises for energy conservation projects; (c) marketing and energy conservation subproject pipeline development, (d) subproject due diligence support, including financial, technical, social and environmental assessment; (e) development of energy conservation-related financing instruments and risk

management tools; and (f) output-based payment scheme linked to energy conservation lending to cover part of the incremental operational cost incurred by the PFIs to maintain a functioning EC business unit or team during the project period as mandated by the project.

(2) *Assistance to other banks* in (a) business startup; (b) capacity building; and (c) due diligence. This assistance will be extended to at least two additional commercial banks, which will lend their own funds to eligible industrial energy conservation subprojects, amplifying the impact of the proposed project and demonstrating the commercial attractiveness of lending for industrial energy conservation investments. These two banks will be selected in the second year of the project implementation.

(3) *Assistance to the overall banking sector*. This will include a series of national workshops to present successful case studies of subprojects carried out by the PFIs in first one or two years, as well as introducing energy conservation technologies and financing products.

(4) *Assistance to energy conservation investment project demonstration*. This will support the preparation and implementation of two or three industrial energy conservation projects in sectors with large replication potentials, but with significant project development difficulties. The objective is to demonstrate effective business models and institutional arrangements for the preparation and financing of energy conservation projects. It will focus primarily on pre-investment activities, such as feasibility studies, due diligence and financing, and institutional arrangements.

19. Component B: Energy Conservation Investment Lending (estimated cost: US\$571.4 million; US\$0.4 million GEF cofinancing). This component includes a total of US\$400 million energy conservation investment lending over five years, and a corresponding US\$171 million equity investment by beneficiary enterprises, and energy conservation investment lending monitoring and verification activities:

(1) *Energy conservation investment lending by PFIs*. A US\$200 IBRD loan will be on-lent by the GOC to two to three domestic banks,⁶ which in turn will lend the funds to enterprises for energy conservation investment subprojects.⁷ These banks, alternatively referred to as PFIs, will be allocated IBRD loan in the range of US\$50–100 million each (the final allocations will be determined at project appraisal). They will be responsible for the repayment of the IBRD loan and will assume all financial risks. The PFIs have also preliminarily agreed to lend at least another US\$200 million for energy efficiency investments from their own resources. It has been agreed that their formal commitments will be submitted to the Bank before project negotiation. The subproject beneficiary enterprises are also expected to contribute 30 percent equity investment, a standard requirement by Chinese banks, totaling US\$171 million.

⁶ The Bank is currently preparing the project with China Development Bank (CDB), Huaxia Bank, and China Export and Import Bank (Exim). The final selection of the banks will be determined, in consultation with the GOC, during appraisal stage.

⁷ The working definition of an energy conservation subproject as adopted in the PFI operational manuals is that the energy cost savings resulting from the subproject will yield a simple payback period of 10 years for the total investment, and that such sub-projects are limited to renovation and rehabilitation within the confines of the beneficiary enterprise's existing facility.

The project staff of the PFIs will be trained to identify potential carbon financing candidates from their subproject pipelines. GEF assistance will not directly support any activities related to the implementation of carbon financing for the identified subprojects. However, the PFI project staff will maintain full transparency with its carbon finance counterparts with regards to GEF support for the identified subprojects. Prior review by the World Bank will be required for any eligible subprojects that have applied for carbon financing from the funds managed by the World Bank. The prior review will assess whether the agreed due diligence process is being strictly followed.

(2) *Monitoring and verification of energy conservation lending*: independent verification of energy conservation lending for the disbursement of the out-put based incentive grant, as well as monitoring of energy conservation subproject performance.

20. ***Component C: National Policy Support and Capacity Building (estimated cost: US\$7.8 million; US\$2.8 million of GEF cofinancing)***: This component will strengthen government capabilities to implement industrial energy efficiency policies and programs in the following ways:

(1) Assisting establishment of the National Energy Conservation Center (NECC), approved by the State Council in August 2006. The main objective of NECC is to support the implementation of national energy conservation policies and programs. This subcomponent will provide organizational and strategic planning assistance to the establishment of NECC, as well as help develop initial work programs of NECC.

(2) Supporting the implementation of priority national energy conservation programs of the 11th Five-Year Plan. This will mainly include a midterm review (2008) of implementation activities to identify problems, recommend remedy measures, and prepare and implement recommended measures.

21. ***Component D: Project Implementation Support and Reporting (estimated cost: US\$0.8 million; US\$0.4 million of GEF cofinancing)***: Because of the innovative character, complexity, and scale of the project, consultants will be recruited to support the implementation of the project, including coordinating technical assistance activities to the banks and the government, as well as organize project monitoring, evaluation, and reporting activities.

22. This is a fully blended project designed to remove the three principal barriers blocking the investments in medium and large-sized industrial energy conservation projects. The GEF grant-financed technical assistance activities will address the knowledge and capacity gaps of the banking sector, alleviate the risk concerns of enterprises, and strengthen the governmental supervision of industrial energy conservation. These efforts will be accompanied by an incentive-backed energy conservation lending program, which will encourage the banking sector to learn by practicing, demonstrate the financial viability of energy conservation investments in a variety of manufacturing facilities, and provide direct support to the government's energy conservation campaign in the 11th Five-Year Plan period. A detailed project description is given in Annex 4.

Lessons Learned and Reflected in the Project Design

23. **Energy efficiency financing.** A 2005 study under a World Bank/UN Foundation-UNEP Technical Assistance⁸ (the three country study) reviewed energy efficiency financing experience in Brazil, China and India. It has identified three principal causes of operational failures in energy efficiency financing: (a) mismatches between the solutions attempted and local institutional environments; (b) lack of proper balance between and concentration upon combining financial intermediation functions and technical assessment functions, and (c) lack of sustained effort and follow through, especially for adjusting institutional mechanisms and approaches during implementation, in response to market changes or arising operational inefficiencies. To manage these concerns, the study team took the following actions which have been reflected in the proposed project:

24. *Careful diagnostic work on existing in-country financial systems, energy efficiency market conditions, and energy efficiency technical assessment capacities.* The proposed project has been developed and designed based on a significant amount of previous work relating to energy efficiency financing in China, and thus recognizes well the challenges and constraints that are being addressed by the project. The three-country study itself provided valuable diagnostic assistance given its focus on China as one of the three countries. The project also draws in a major way from the experiences of the China Energy Conservation Projects 1 and 2. In addition, the project design has been shaped by a technical study,⁹ carried out as part of project preparation, which identified and assessed energy efficiency investment opportunities in China's medium- to large-scale industrial enterprises.

25. *Parallel attention to the details of developing capacities and mechanisms for financial intermediation aspects and for project pipeline development and technical appraisal throughout the project period.* The capacity building and business development for energy efficiency financing (Component A) has been designed to respond to the requests of PFIs, industrial enterprises, service providers, and other stakeholders and to incorporate lessons learned from the lending component of the project to provide relevant support for institutional development. The technical assistance activities are customized to individual PFIs, based on each bank's areas of needs and interests.

26. *Flexibility in project design, so that programs can be adjusted during implementation.* Within the broad parameter of financing industrial energy conservation investments, the proposed project has been designed to offer PFIs significant flexibility in their financing decisions for specific subprojects and particular industries. The proposed project ties a significant portion of GEF grant to all of PFIs' energy conservation lending. This on one hand encourages PFIs to scale up energy conservation business, and on the other hand prevents inefficient use of grants if the performance of the PFIs does not meet expectation. The provision for assisting two additional banks in a later phase (in the second year or so) also adds flexibility for the project to respond to unforeseen needs.

⁸ World Bank/U.N. Foundation-UNEP Technical Assistance Project, "Development of Financial Intermediation Mechanisms for Energy Efficiency Investments in Developing Countries," September 2005.

⁹ "China Energy Efficiency Financing Project: Report for World Bank", Tokyo Energy Efficiency Group, December 31, 2006. The report is included in the project files.

27. **Financial intermediary lending.** Lessons learned from lines of credit in China and other countries that have been taken into account in the design of this project include the following:

- Weak borrower accountability and management capacity have contributed to unsuccessful projects in China and other countries.
- Inadequate demand from ultimate beneficiaries and lack of bankable subprojects has, in the past, led to problems in the implementation of lines of credit in other countries.

28. *Weak borrower accountability and management capacity have contributed to unsuccessful projects in China and other countries.* In previous lines of credit in China, most of the failed intermediation operations were through government agencies that lacked the appropriate institutional and operational capacity. Importantly, they did not have the appropriate financial sector skills, nor did they have incentives to support lending activities. The participating banks of this project are major policy and commercial financial institutions with difference strengths. The CDB and Exim have extensive experiences with large industrial enterprises, while Huaxia is a publicly traded commercial bank with an expanding industrial portfolio. The proposed project will build on the existing industrial investment financing knowledge and skills of PFIs and help them develop more specialized industrial energy conservation investment financing business.

29. *Inadequate demand from ultimate beneficiaries and lack of bankable subprojects has, in the past, led to problems in the implementation of lines of credit in other countries.* China has a large and growing number of energy-intensive industrial enterprises for which energy efficiency investments present a financially attractive opportunity. The proposed project will help PFIs develop a robust pipeline of subprojects and work with government counterparts to launch programs to bring industry, banks, and service providers together to enhance interest in energy efficiency investments and develop bankable subprojects.

Alternatives Considered and Reasons for Rejection

30. The proposed project considered two options for the provision of financing for industrial energy conservation: (a) direct lending to industrial enterprises, and (b) lending through domestic banks to industrial enterprises. The first option, which is likely to focus on a specific industry and/or a few large energy conservation subprojects, will generate significant project-level energy savings, but will have a very limited impact on scaling up over all industrial energy conservation investments. The second option, by leveraging on the banks resources and industrial sector knowledge and connections, will allow the project to broaden its scope and impact. The direct involvement of the banks in energy conservation investment financing with targeted technical assistance provided by the project will significantly shorten the banks' learning curve and speed up their energy conservation lending business development. Without being tied down to a few specific energy conservation subprojects, the second option allows the project to assist industries more broadly in identifying energy conservation investment opportunities and arranging for financing. It also allows the project to offer more substantive assistance to the government to improve the industrial energy conservation investment environment. Compared to the first option, the second option would significantly enhance the leverage on scaling up and sustaining industrial energy conservation investment financing, a key to the achievement of the project development objective. Therefore, the direct lending option is rejected.

31. The proposed project also selected the focal area of energy efficiency financing with project funds. Energy efficiency financing could target the adoption of more energy efficient technologies and systems in connection with (a) a new business startup or capacity expansion and (b) renovation and rehabilitation of technologies and systems at existing facilities. Financing was not found to be a big constraint for new projects and capacity expansions for which banks are willing to lend based on the new revenue and profitability opportunity and the collateral provided by the asset base. Such subprojects, while they might lead to enhanced energy efficiency, are primarily motivated by growth-oriented objectives. Therefore, the proposed project will focus on the latter opportunities.

C. IMPLEMENTATION

Partnership Arrangements

32. As part of the project design process, other multilateral and bilateral energy efficiency projects in China were reviewed. Of direct relevance is the China End-Use Energy Efficiency (EUEEP) Project financed by GEF and being implemented by the UNDP and NDRC. Areas of coordination and collaboration between the proposed project and EUEEP have been identified. The NDRC, which is the executing agency for both projects, will take the lead. One of the main technical assistance activities of the EUEEP project, Capacity Building and Training for Provincial Energy Conservation Centers, will reinforce Component C of the proposed project (C1: Assistance to the Establishment of the National Energy Conservation Center). The EUEEP also will provide substantive energy audit trainings to selected provincial energy conservation centers. This will be linked to the identification and preparation of the energy conservation investment subprojects financed by the PFIs. The proposed project with its focus on debt-financing for industrial energy conservation will feed into EUEEP's activity in Policy Development on Energy Efficiency Financing Options.

Institutional and Implementation Arrangements

33. The proposed project will be implemented over five years. It has two parallel tracks of closely related activities that require different types of attention: Track 1—Energy Efficiency Lending and Technical Assistance to PFIs corresponding to Component B, and A (1), and Track 2—Capacity Building and Technical Assistance corresponding to Components A (2), A (3), A (4), C, and D. PFIs will be responsible for the implementation of activities under Track 1. NDRC will be responsible for the implementation of activities under Track 2. A PMO will be established under NDRC to manage the project activities under Track 2 on behalf of NDRC and coordinate the implementation of other project activities to be implemented by PFIs. In addition, a Steering Committee comprising representatives of the MOF and NDRC will provide policy guidance to PFIs and other stakeholders for project implementation.

34. **Track 1: Energy Efficiency Lending.** The MOF will represent the GOC in signing the Bank loan agreement. It will pass on the funds to PFIs, in accordance with an onlending agreement to be signed between the MOF and PFIs. The MOF has indicated that the loan will be passed on to PFIs on the same terms and conditions as the Bank loan. The PFIs have the full responsibility of the energy efficiency lending and related technical assistance activities, and

bear all the financial risks. To a large extent, the lending activities will be implemented within the existing institutional framework and under their existing business procedures and regulations. However, it has also been agreed that within each PFI, a project team will be formed to coordinate or implement the lending activities and to act as the focal point of the PFI to interact with the Bank, the PMO, and other stakeholders.

35. PFIs are preparing their operational manual for the project, which will cover financial management, procurement arrangements, detailed institutional arrangements, and economic, financial, technical, environmental, and social due diligences procedures and methodology, as well as business procedures. The draft manuals will be provided to the Bank for review prior to appraisal and will be agreed with the Bank during the project appraisal.

36. ***Track 2: Capacity Building and Technical Assistance.*** Working together with the MOF, the NDRC will be responsible for the implementation of technical assistance activities under Track 2. The PMO has been effectively conducting project coordination activities for the first and second China Energy Conservation Project. Coordination responsibilities for the proposed project will also be undertaken by the same PMO. The PMO will also coordinate with the selected domestic banks, national and provincial government bodies, and other relevant stakeholders.

37. The project will use a report-based disbursements method, subject to the final agreement between the Bank, MOF, and PFIs. The report format, content, and frequency will be determined at project appraisal. Consistent with their asset and liability management strategies and business needs, all the PFIs expressed a desire to limit the number of withdrawals preferably within two transactions. Accelerated disbursement will not result in relaxation of Bank surveillance and supervision of project implementation. Following full disbursement of Bank loan proceeds, PFIs will continue to provide subsidiary loans to energy conservation investments with their own resources. The possibility for PFIs to seek additional financing from the Bank is also open.

Monitoring and Evaluation of Outcomes and Results

38. Performance monitoring of the proposed project would include (a) the monitoring of performance indicators, as included in Annex 3, and (b) annual progress reports and a midterm review on the preparation and implementation of the project components. The PMO will be responsible for monitoring and evaluation of activities under Track 2 and coordinating monitoring and evaluation of activities under Track 1, including the collection of project performance information and reporting on the impact and results of this project. The PMO will develop a monitoring and evaluation plan during the first year of implementation, and a member of the PMO will be assigned to collect information and develop databases to monitor the performance and progress of implementation of both components. For activities under Track 1, the project team within each PFI will be responsible for collecting information under the assistance of the PMO and reporting to the Bank through the PMO. As part of Component B, US\$3.2 million of GEF grant is proposed for a performance-based incentive scheme, which will cover the variable cost of energy conservation lending based on each PFI's actual level of energy conservation-related disbursements. The project will engage an independent third party to monitor and validate the energy conservation-related disbursements, and payments under the scheme will be made only pursuant to the third-party confirmation.

39. Monitoring and evaluation will also form the basis for dissemination of practical experience in financing medium-size to large energy efficiency subprojects. The experience of the selected PFIs will be leveraged to promote energy efficiency financing in non-PFI banks. Further, successful case studies in the first one or two years of project implementation, including information on financing products and energy conservation technologies applied, will be disseminated through national workshops. The project, under Component C (National Policy Support and Capacity Building), is also supporting the development of energy efficiency monitoring and evaluation capacity at the NECC, which will enable improved energy conservation information collection, analysis, and dissemination.

Sustainability and Replicability

40. ***Sustainability.*** The Government of China promotes energy conservation as a long-term national strategic policy for economic development. The Energy Conservation Law of China was issued in 1997 and will be strengthened after the ongoing amendment. One major effort of the GOC since the late 1990s has been the encouragement of market-based energy conservation schemes, as evidenced by the strong support to and the growing strength of energy management companies. The proposed project was requested by the GOC as a key part of the continued effort to broaden and scale up market-based energy conservation initiatives, especially in industrial energy conservation investment financing, an area traditionally supported by government funds. The government's own assessment and independent evaluation have confirmed that there are large untapped bankable energy conservation investment opportunities in energy-intensive industries, and the domestic banking sector can develop and build a viable commercial energy conservation lending business and substantially increase investments in industrial energy conservation renovations. The proposed project has been designed together with the participating banks and the government to address their critical concerns about the entry barriers, market dynamics, and business risks of industrial energy conservation financing. The effectiveness of the project is improved by the integrated approach of (a) operational engagement of financial institutions by making available special loan funds dedicated to industrial energy conservation lending, and (b) provision of technical assistance for capacity and market development, which directly support the energy conservation lending activities of PFIs. The recently launched national program to strengthen energy management at the largest 1,008 industrial facilities also enhances the project's sustainability by priming the most reliable part of the industrial energy conservation market.

41. ***Replicability.*** The proposed project will be replicated in two ways: (a) replication of energy conservation lending business model(s) among domestic banks; and (b) replication of specific energy conservation business lines in particular industries. The replication of energy conservation lending business model(s) among domestic banks will be reinforced by providing hands-on assistance at a later phase of the project to two additional banks which will use their own resources to finance industrial energy conservation investments. The quick dissemination of the early experiences of the PFIs throughout the banking sector and the targeted industries also is likely to result in potential replication initiatives. With the replication of specific energy conservation business lines in particular industries, it is expected that PFIs will build expertise in energy conservation lending to specific industries and project types, based on their project portfolios and markets. Through such rigorous specialization and replication, the PFIs should be able to quickly build a strong knowledge base to target financially sound energy conservation

subprojects, lower transaction costs significantly as evaluation and appraisal processes are streamlined efficiently, and thereby gain business confidence to further scale up their energy conservation business line. As more industrial enterprises begin to implement energy conservation projects and the financial benefits of such projects will be increasingly widely recognized, other (possibly less financially strong) enterprises may find energy conservation investment a good strategy to enhance their financial positions. The banks may also become less risk-averse to enterprises with subprime credit ratings because of improved knowledge and confidence in the financial returns of energy conservation projects. Overall, the replication potential is backed by the large size of industrial energy conservation market in China, especially in primary energy intensive manufacturing industries, such as steel, cement, synthetic ammonia, and petrochemicals.

Critical Risks and Possible Controversial Aspects

<i>Risks</i>	<i>Risk mitigation measures</i>	<i>Risk rating with mitigation</i>
To project development objective		
The current government agenda to promote industrial energy conservation is set back by continued focus on output-oriented growth, undermining efforts to pressure industries to improve energy efficiency and diverting financial resources away from energy conservation.	<ul style="list-style-type: none"> • The GOC has set up a series of stringent technical guidelines and standards to prevent the expansion of inefficient industrial facilities. • The NECC to be established under the project will further strengthen the government's capability of enforcing related energy conservation policies, laws, regulations and standards at various levels. • An elaborative system has been set up by the government to implement and monitor the goal of reducing the energy intensity of GDP by 20% from 2005 to 2010. 	Modest
To component results		
Slow subproject pipeline owing to low demand from enterprises.	<ul style="list-style-type: none"> • All the PFIs are required to develop at least 30% of the subprojects before negotiations. • Technical assistance will be provided to all the PFIs for business development. 	Modest
Slow buildup of PFIs capacity to appraise and process subproject loans.	<ul style="list-style-type: none"> • Technical assistance will be provided to all the PFIs for business startup, new product development and capacity building. 	Low
Slow pace in establishing the NECC due to budget and staffing difficulties.	<ul style="list-style-type: none"> • Strong leadership assumed by the NDRC in creating NECC and the pressing need of the government to strengthen its implementation capacity for the priority energy conservation programs endorsed by the 11th Five-Year Plan. 	Low
Overall risk rating		Modest

Loan/Credit Conditions and Covenants

42. *Conditions of Appraisal*: Eligibility of the PFIs will be reconfirmed based on their 2006 audited financial reports.

43. *Conditions of Negotiations*: To be determined.

44. *Conditions of Effectiveness*: To be determined.

45. *Covenants*: To be determined.

46. *Other special covenants:* To be determined.

D. APPRAISAL SUMMARY

Economic and Financial Analyses

Economic and Financial Due Diligence of the PFIs

47. China's economy has been growing at a sustained and high rate of around 10 percent in recent years, fueled by high rates of domestic investment and export growth. Its medium-term inflationary pressures remain moderate and the overall growth prospects of economy remain favorable. Recently, the government has been making steady progress in reforming the financial sector and opening it up to competition. Consequently, China's banking sector has started to emerge from a decade-long process of reform to a market-based banking system.

48. Three banks (China Development Bank (CDB), China Export-Import Bank (Exim), and Huaxia Bank) were selected as potential PFIs from six Chinese banks through an initial screening. Subsequently, the Bank performed its financial due diligence of CDB and Huaxia in accordance with the established eligibility criteria set by Bank Operational Policy and confirmed their pre-selection as PFIs. The eligibility of these two banks will be reconfirmed during the appraisal mission. In the absence of financial statements prepared and audited in accordance with accounting and auditing principles acceptable to the Bank, it was agreed with China Exim that it would undertake Agreed-Upon Procedures on financial statements for the year ended December 31, 2006. Exim's full eligibility will be subject to due diligence review and a time-bound action plan, which will be carried out following the completion of the Agreed-Upon Procedures. CDB and Exim are two of the three state-owned policy banks in China, while Huaxia Bank is a commercial bank established in October 1992. At the end of 2005, CDB and Huaxia Bank had capital adequacy ratio of 10.5 percent and 8.2 percent, respectively, and their ratio of non-performing loans (NPLs) stood at 1.2 percent and 2.8 percent, respectively. Detailed findings from the due diligence of CDB and Huaxia Bank are included in Annex 9.

Economic and Financial Analysis of the Project

49. The selection of subprojects for energy efficiency financing will be the responsibility of onlending banks. Such financing will focus on renovation and rehabilitation activities whose primary financial benefits will be derived from energy savings.

50. It is widely recognized that most energy efficiency investments are economically justified if they are financially viable. In China, where coal is the dominant fuel, the economic justification is even stronger because of the significant environmental benefits expected from energy efficiency investments, resulting in economic internal rates of return (EIRRs) that are higher than the financial internal rates of return (FIRRs). This project is built on the premise that the proposed energy efficiency subprojects are economically justified if they are financially viable, and hence onlending banks will not be required to ensure that the EIRR of selected subprojects exceed any pre-established economic discount rate. However, only subprojects that

yield expected FIRR that exceed the weighted average cost of capital of the subproject sponsor will be eligible for bank financing.

51. To confirm the validity of the above premise, economic and financial analyses were carried out on four representative samples of the first batch of subprojects envisaged for financing under the proposed project. The four subprojects include two waste heat recovery subprojects, a rehabilitation to replace outdated fans and pumps with more efficient ones, and a rehabilitation of a production line in the petrochemical industry. A more detailed description of these four subprojects is provided in Annex 9. The subproject investments ranged from US\$5 million to US\$21 million. The financial impacts of the subprojects were analyzed based on the financial benefits, including from energy savings of the subprojects, and the costs, including the incremental operating costs due to the subproject. The economic analysis additionally took account of the environmental benefits from reduced CO₂, SO₂, and particulate emissions. The FIRR were calculated with and without assuming the benefit of carbon financing for a 10-year term. The derived FIRR ranged from 11.2 to 48.2 percent (before income tax) without carbon finance and 12.5 percent to 60.2 percent with carbon finance benefits, demonstrating the financial attractiveness of these subprojects to the subproject sponsors. The analyses showed that the EIRR for the representative subprojects ranged from 13.2 percent to a high of 64.2 percent, exceeding the 12.0 percent economic discount rate that is normally applied to Bank projects. A more detailed financial and economic analysis is provided in Annex 9.

Technical

52. Although the subprojects to be financed by the Bank loan will be selected by the PFIs, it has been agreed that the subprojects will be mainly chosen within the framework defined by the ten priority energy efficiency programs presented in the GOC's Mid and Long Term Energy Conservation Plan. This will ensure that all the subprojects meet latest Chinese national technical standards, which are in general consistent with international practice. In addition, a technology screening and review has been undertaken by international consultants for all the major energy conservation technologies in China's major energy-intensive industries. The results of the review have been given to PFIs for their reference. Finally, during the project implementation stage, technical assistance will be provided to PFIs for project technical due diligence. This will ensure that the design of the subprojects will be technically sound.

53. It has been agreed between the Bank and GOC that this project will finance only energy conservation renovation or rehabilitation projects. Subproject investments shall be limited to renovation and rehabilitation of existing physical component(s) and system(s) with the objective of achieving higher energy efficiency. Such renovations and rehabilitations will be confined within the sub-borrower's existing premises, and any new construction will be within the boundaries of existing premises such that no new land acquisition will be made for the purposes of the subproject. Greenfield subprojects shall not be eligible for energy efficiency financing.

Fiduciary

54. The proposed project meets the minimum Bank financial management requirements, as stipulated in BP/OP 10.02. In the opinion of the Financial Management Specialist, the project will maintain adequate financial management arrangement acceptable to the Bank and, as part of

the overall arrangements that the borrower has in place for implementing the operation, provide reasonable assurance that the proceeds of the loan and GEF grant will be used for their designated purposes. Financial management risk is the risk that World Bank loan proceeds will not be used for the purposes intended and is a combination of country-, sector-, and project-specific risk factors. Taking into account the risk mitigation measures proposed under the project, the FM risk rating proposed for this project during the appraisal stage is moderate (pending conclusion at appraisal).

55. A procurement capacity assessment has been carried out focusing on reviewing the capacity of the established PMO under the NDRC. It concluded that the PMO has adequate experience and capacity to carry out the procurement activities related to technical assistance to be funded by GEF. In this respect, the procurement risk is rated as “average.” A brief summary of the procurement capacity assessment and more details on the procurement arrangements are provided in Annex 8.

Social

56. The proposed project is not expected to trigger any social safeguard policies.

Environment

57. In accordance with World Bank environmental safeguard policies (OP/BP/GP 4.01), the project has been assigned Category “FI” since individual subprojects to be financed by the PFIs will be identified after project implementation. As is the requirement for FI projects, the PFIs prepared a Framework Environmental Impact Assessment (EIA) Document (Framework Document) acceptable to the World Bank. This Framework Document is presented in Annex 10.

58. The Framework Document describes procedures to be followed by any Sub-borrower and PFI to satisfy both Chinese and World Bank EIA regulations and policies. Chief features of the Framework Document include procedures to be followed for screening, Environmental Assessment documentation, public consultation, EIA review and approval, disclosure, supervision, and reporting. The Framework Document specifies that any subproject that Chinese environmental authorities determine as requiring a full EIA during screening (equivalent to World Bank Category A) or as requiring land acquisition will be rejected from further consideration under the World Bank loan. The overwhelming majority of energy efficiency subprojects are anticipated to have either minor or no environmental impacts or require land acquisition. Therefore, this criterion is not expected in anyway to limit the subproject pipeline.

59. A primary requirement of the Framework Document is the requirement that the Sub-borrower provide the PFI an Information Package that includes the Sub-borrower EIA approval letter or certificate, the EIA document, and documentation that consultation and disclosure were performed in accordance with Chinese and World Bank requirements. Furthermore, since energy efficiency subprojects are almost always associated with an existing operation/process, the Information Package will also include documentation that the “connected project” had all the necessary Chinese EIA approvals prior to construction and/or operation of the connected facilities.

60. All PFIs involved in the loan plan to contract with Chinese environmental consultants for any technical reviews or activities that are their responsibility. Since the potential environmental impacts likely to be associated with the anticipated subprojects are either minor or negligible, this arrangement is considered acceptable.

Safeguard Policies

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment (OP/BP/GP 4.01)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Natural Habitats (OP/BP 4.04)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pest Management (OP 4.09)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cultural Property (OPN 11.03 , being revised as OP 4.11)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Involuntary Resettlement (OP/BP 4.12)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Indigenous Peoples (OD 4.20 , being revised as OP 4.10)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Forests (OP/BP 4.36)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Safety of Dams (OP/BP 4.37)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Projects in Disputed Areas (OP/BP/GP 7.60)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Projects on International Waterways (OP/BP/GP 7.50)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Policy Exceptions and Readiness

None

Annex 1: Country and Sector or Program Background
EAST ASIA AND PACIFIC: China Energy Efficiency Financing

MACROECONOMIC OVERVIEW

1. **Recent macroeconomic developments.** 2006 was the fourth year in a row in which China enjoyed GDP growth in excess of 10 percent. This sustained high level of economic growth could be attributed to four principal drivers. First, continued economic reforms have made China's labor and capital resources more productive. World Trade Organization (WTO) accession in 2001, with increased entry and competition in domestic markets and improved access to foreign markets, has propelled trade, investment and competition, factors that are associated with productivity increases around the world. China has also been reaping the full benefits of the state-owned enterprises (SOE) reforms initiated in the mid-1990s. Second, increased business profitability and a recovery in government revenues have boosted already high savings and investment. China's high saving and investment allowed more capital deepening and infrastructure construction, which in turn increased labor productivity and potential GDP. Third, better macroeconomic management has reduced economic volatility and risk. Fourth, the global environment has been very favorable. Global growth in the last five years has been remarkably resilient, and averaged around 4 percent, levels not seen since the late 1980s. This has created a favorable environment for China's exports, which grew an average of almost 30 percent per year.

TABLE A1.1. CHINA – SELECTED ECONOMIC INDICATORS

	2003	2004	2005	2006	2007*
Real GDP growth rate (production side)	10.0%	10.1%	10.4%	10.7%	9.6%
Consumer price inflation	1.2%	3.9%	1.8%	1.5%	2.5%
Current account balance (USD billions)	46	69	161	230	260
<i>As share of GDP</i>	2.8%	3.6%	7.1%	8.7%	6.3%
Foreign exchange reserves (USD billions)	403	610	819	1,066	1,334

* China Country Team, World Bank (Quarterly Update – February 2007) projections

2. As exports have continued to outpace imports by a large margin, China's trade surplus reached new record highs in the second half of 2006, and the contribution of net trade to GDP growth increased from almost 2 percentage point in the first half to 3.3 percentage points in the second half of 2006. Rapid increases in trade surplus and foreign direct investment (FDI) flows have led to China's foreign exchange reserves increasing at a rate of 38 percent annually during 2003-06, with reserves of over US\$ 1 trillion at the end of 2006. The trade surplus may flatten out eventually because the expansion of manufacturing capacity that underlies much of it is likely to moderate. Nevertheless, imports have been growing more slowly than would be expected based on historical patterns for a few years now, in part because of continued deepening of supply chains within China. With regard to inflation, consumer price inflation has picked up recently, due to higher food prices, especially grain prices. Since WTO accession, grain prices in China have been moving more in line with international prices. In December

2006, consumer prices rose by 2.8 percent (year on year based). Non-food consumer price inflation remained modest at around 1 percent. Despite the increase in consumer price inflation, medium-term inflationary pressures remain moderate, given relatively good credibility of monetary policy, a strong currency, and excess labor force in the economy.

3. China's industry, investment and export based growth model has become increasingly problematic because of the trade tensions, and environmental and resource constraints it entails. China's trade in goods is already very open, and further opening up, while desirable, is likely to generate less efficiency gains than in the past. Moreover, if driven by accumulation of capital alone, growth will be subject to diminishing marginal returns. However, long-term prospects for economic growth in China remain good. It is expected that increases in both labor and capital productivity, where China lags behind significantly compared to more advanced countries, will be an important source of future growth. Forty percent of China's labor force is still tied up in low productivity agriculture, where labor productivity is only around one-sixth of that in the rest of the economy. On the demand side, growth in consumption is expected to play a more important role in the future, both to sustain economic growth and to mitigate trade imbalances. Most of the decline in the consumption to GDP ratio since the late 1990s can be explained by the decline in the share of wage income in the total economy rather than a change in household savings behavior. The share of wages in GDP declined from 53 percent in 1998 to 41.4 percent in 2005 compared to 57 percent in the United States.

BANKING SECTOR OVERVIEW

4. The third national financial work conference concluded on January 20, 2007 set out directions for improving China's financial sector. This high level meeting, held every 5 years, has charted major new policies in the past. This year's meeting discussed a wide range of reforms including in rural finance, policy banks, and foreign exchange management. The meeting decided on broad direction of reforms, which over the coming months and years will become more detailed.

5. Restructuring of the ownership of the state-owned commercial banks (SCBs) has sped up in 2005 while China is required to honor the WTO stipulation to open up its banking sector fully to foreign investors by the end of 2006. Among the four largest state owned banks (SCBs), the China Construction Bank (CCB) completed its high-profile public offering on Hong Kong Stock Exchange in October 2005, the Industrial and Commercial Bank of China (ICBC) and the Bank of China (BOC) had received approval for their selection of international strategic investors and are preparing for IPOs in 2006 or 2007. The foreign strategic investors have promised to contribute to improvement of corporate governance, risk management, new product development and asset management of the banks they have invested in, through nomination of board directors. Full time directors have been assigned to the board of each SCB by the central government through Central Huijin Corporation, a quasi bank restructuring agency whose stake in financial institutions is rapidly rising as its equity investment covers both banks and securities houses.

6. Equity participation by foreign banks is seen as a vote of confidence in the Chinese banks as well as the Chinese economy in the long run. Nonetheless, it remains unclear whether the foreign investors have enough incentives to monitor the bank, since their shares are only 5-10%

to begin with. To enable the 3 SCBs to prepare for IPOs, the government has invested heavily, through both injection of capital and purchase of non-performing loans (NPLs). In a way, it can be said that the government is “outsourcing” part of the oversight to foreign regulatory authorities and markets, to circumvent domestic and political constraints. One such constraint is continued political appointment of senior managers at the SCBs, a unique Chinese phenomenon that increasingly gets in odds with modern corporate governance in which senior appointment is exclusively a function of the board of directors. It is understood that with foreign investors coming in and rigorous oversight by regulators from the market where the SCBs shares will be listed, pressure will rise to change the status quo.

7. Total reported NPLs of commercial banks accounted for 8.6% of the total loans at the end of 2005, reduced from 13.2% in 2004. The reported NPL ratio of the Big-Four State-owned Commercial Banks also decreased to 10.5% in 2005 from 15.6% in 2004. The rate of return on asset and on equity remains low industry wide. According to the new series of Indicators for Risk-based Supervision of Commercial Banks issued by CBRC in January 2006, the minimum rate of return on asset of commercial banks should be 0.6% and return on equity 11%. This new rule is currently applicable to the Big-4 SCBs under restructuring, and will be officially enforced in 2007.

8. **Foreign participation in second-tier banks.** By the end of 2005, 173 foreign banks from 40 countries and regions had established 240 representative offices in 23 cities in China, and 71 foreign banks from 20 countries and regions have established 238 operational entities (including 181 branches and 14 legal entities) in 23 cities in China. Total assets of these foreign banks in China reached US\$ 84.5 billion, accounting for about 2% of the total banking asset of China. 19 foreign financial institutions have invested about US\$20 billion as of the end of 2005 in Chinese banks. In response to CBRC regulations on capital adequacy and risk management, the second-tier banks, including both joint-equity national banks (14) and city commercial banks (114), have intensified efforts to replenish capital. The increased appetite for foreign and private capital has provided a window of opportunity for foreign banks to take equity positions in banks that would not have opened up in the past. Up to now more about 15 second-tier banks have received foreign investment, and several more are in the process of doing so.

9. On rural finance, January 20, 2007 conference decided to reduce the access threshold for financial institutions into the rural market and to continue the shareholding reforms of the Agricultural Bank of China (ABC). Before the conference, the China Bank Regulatory Commission had already announced more detailed measures regarding increased access. They are a major step towards a more open and diverse rural financial market, which for decades has lagged behind developments in other parts of the financial sector. This is particularly true on the lending side. Other financial services such as depositing money and payments services are abundantly available. The net withdrawal of funds from the countryside, which is common around the world, is accentuated in China by insufficiently developed rural finance. Key factors hindering lending are constraints on entry, limits on lending rates, weak existing rural financial institutions, and an inadequate legal environment. These issues have taken central stage as better rural finance is an important building block for the new socialist countryside and harmonious society. Looking ahead (i) for rural finance to be sustainable it needs to be commercially viable, with interest rate caps removed; (ii) rural economies and finance would benefit from a more

diversified field of providers; (iii) a more differentiated rural financial sector will require adjustments to the regulation and supervision framework; (iv) the government rightly is putting renewed emphasis on reforming the ABC; and (v) consolidation of reform of the Rural Credit Cooperatives (RCCs) is important.

ENERGY EFFICIENCY CHALLENGES

10. China is the second largest greenhouse gas (GHG) emitter in the world, mainly due to its enormous fossil fuel (primarily coal) consumption. Since 1990, energy consumption in China has grown at a rapid pace of 5.8 percent annually, more than three times faster than the rest of the world, and shows no sign of abetting as China continues on its fast pace of economic growth. The total energy consumption and total GHG emissions surged to about 2.4 billion tons coal equivalent (tce) and around 850 million tons of CO₂ emissions¹⁰, respectively, in 2006. Despite the unprecedented growth, China's per capita energy consumption is still at less than one fifth of the OECD average, with significant room to grow with the increase in per capita income. Supplying China's ever growing energy needs with fossil fuels, especially coal, will most likely result in unacceptable environmental damages, both locally and globally, and escalate energy security concerns.

Low energy efficiency and improvement barriers

11. Despite China's achievements in improving energy efficiency in the 1980-90s, its level of energy efficiency still remains significantly lower than that in the developed economies of the world. The large and growing contribution of the energy-intensive industrial sector in China's economy has been a primary reason for rapid increases of energy consumption in recent years. Energy-intensive industrial sector accounts for about 50 percent of primary energy consumption in China. The top 1008 energy-intensive industrial users which consumed 670 million tce in 2004 accounting for 33% of the total energy consumption in China. These sectors operate at significantly higher levels of energy inefficiency when compared to international best practices, with energy use per unit of production higher in China by, for example: 21% in iron & steel, 19% for coal-fired power plants, 31% for nitrogen fertilizer, 15% for coal-fired boilers, and 45% for cement.¹¹ The significant potential and technical options for energy efficiency (EE) improvement and GHG emission reduction in these sectors is largely untapped in China even though the opportunity to garner high financial returns through the application of many internationally well-proven EE technologies and techniques are currently available. The consensus among Chinese experts is that most of the existing fixed assets in China's energy intensive industries, especially those in medium and large enterprises, will still remain in production until at least 2020. There is currently a large window of opportunity to rehabilitate and upgrade these existing assets to improve their energy efficiency in the next five years or so.

12. While there are a number of reliable EE technologies that can be implemented, historically many industrial enterprises have refrained from implementing new energy efficiency improvement measures in their existing facilities because of the perceived technical and financial

¹⁰ Assuming a carbon intensity of 2.3 ton CO₂e/ton raw steel production based on the analysis in "China Sustainable Energy Scenarios in 2020" – Energy Research Institute of China, 2003

¹¹ State Development and Reform Commission, Mid and Long-term Energy Conservation Plan, 2004.

risks. Based on some recent studies, including the Three Country Energy Efficiency Project (3CEEP), the most notable reasons why enterprises have avoided energy efficiency investments include:

- ***Unfamiliarity with EE investments amongst energy-intensive enterprises.*** The demand pressure from the rapid growth of the Chinese economy has pushed industrial enterprises to focus on meeting demand through rapid expansion and thus management at these enterprises have not been paying much attention to opportunities for cost savings through efficiency improvements such as through the installation of more energy efficiency systems and technologies. As a consequence, enterprises often are not fully aware of the significant financial benefits from EE investments and do not know how to systematically identify and design comprehensive EE projects. Compared to investments in output expansion whose benefits appear more tangible, benefits from energy-saving investments are future cost savings, which often are perceived to be less real or certain. Because of the unfamiliarity with EE projects, enterprises also consider them risky and are especially concerned that the energy efficiency renovation will disrupt normal business operations, leading to loss of productivity and revenues.
- ***Unique characteristics of large and medium EE investments.*** Compared to small scale industrial energy conservation projects, which usually cost less than US\$5 million per project and have very short payback periods (1-2 years), medium- and large-sized projects typically are technically more complex, sometimes involving unfamiliar technologies and optimization of production processes, and require longer payback periods. Hence, even if industrial enterprises are interested in and capable of implementing EE projects, the technical and financial concerns regarding large and medium EE investments might be well justified for them to not undertake some identified EE investments.
- ***Lack of financing for EE investments.*** The pressure to meet rapid demand growth has forced energy-intensive enterprises to prioritize production expansion activities by re-investing internally generated cash to boost production rather than for “peripheral” activities such as renovation projects to improve energy efficiency. Hence, financial commitments for EE investments by the beneficiary enterprises have been limited. Further, as will be discussed in detail below, unfamiliarity with industrial energy conservation technologies and a lack of knowledge of energy-efficiency business opportunities among Chinese banks have constrained the availability of external financing for EE investments.
- ***Weak policy and regulatory support.*** In the wake of the great expansion of energy-intensive industries in the last 10 years or so the government’s capabilities to effectively implement its energy efficiency policies and programs has declined considerably in relative terms. Given the size and large weight of the energy-intensive industries in China’s economy, as well as the widespread inefficient practices among their major facilities, policy and regulatory interventions have lagged behind in encouraging industrial enterprise to undertake energy efficiency investments. .

13. Due to the above mentioned risks and constraints perceived by large and medium energy-intensive enterprises, the market potential for energy efficiency investments has remained largely

unexplored in China. Tackling these barriers to develop a sustainable energy efficiency investment market requires efforts to: disseminate information and build capacity to understand energy efficiency technologies, implement best practices and mitigate technical as well as financial risks; emphasize government policy and regulatory support; and mobilize financing for EE investments.

Energy efficiency financing

14. GOC has highlighted financing, especially financing from Chinese domestic banks, as a key challenge in promoting EE investments. Before the late 1990s, the primary funding sources for energy efficiency projects were public funds, including the central government's dedicated energy-conservation funds channeled through state-owned banks, and local government counterpart financing. With the progress of enterprise reform and fiscal reform, the GOC gradually eliminated public funds for energy conservation project financing since the late 1990s, with the expectation and assumption that Chinese banks would step into the void and build a commercially viable EE business line, providing credit on market terms and conditions for EE projects.

15. Despite the rise in energy prices in recent years which has strengthened the rationale and interest for implementing energy efficiency investments among energy intensive enterprises, Chinese banks have not yet embraced energy efficiency financing as a significant business line. Recent studies indicate that the share of EE investment in the country's total investment has, in fact, not reached the level achieved during the 1980s. There are many reasons why China's banks have been reluctant to build their energy efficiency finance business line, but perhaps the most fundamental ones include:

16. ***Reluctance to extend credit for large energy efficiency transactions due to the absence of knowledge or experience in this field.*** Energy efficiency projects usually do not directly generate additional revenues, but contribute to earnings through reduction of energy bills. This makes it difficult to identify and trap cash flow from the projects. Chinese banks are not familiar with the intricacies of financing EE projects; neither do they have the internal capacity to properly evaluate the risks and benefits of their design, or to structure their financing in market-oriented ways. In general, Chinese banks are accustomed to providing loans for production expansion projects. Thus, they usually do not recognize the cash flow generated by "savings". It is difficult for Chinese banks to view savings from projects as hard assets with sufficient market value to adequately secure a loan. The lack of familiarity with energy efficiency projects contributes to the (unwarranted) perception that loans for such activities constitute unduly high financial risk, typically resulting in unattractive financing cost and terms.

17. Compounding this problem, ***energy efficiency project financing is regarded as a specialized niche market***, which does not provide the scale to build institutional knowledge, streamline lending processes, lower transaction costs, and improve risk management which would be necessary to build a profitable EE business line. From a technological point of view, there is a large variety of energy efficiency technologies, and domestic banks and other financial intermediaries perceive that it is very difficult to do repeat business, hence limiting the "learning

curve” benefits that are crucial to motivate EE lending. The costs of project appraisal and supervision are thus perceived to be very high.

18. ***Lack of conducive credit culture and management system of Chinese commercial banks to providing financing for energy efficiency activities.*** The combination of a history of relatively poor loan repayment and inability to charge for risk has caused Chinese commercial banks to be exceptionally conservative in their lending policies. While the latter is becoming less of an issue, exceptionally high loan collateral and guarantee requirements continue to be a barrier to securing debt financing. Loan requests perceived as high risk are refused by the banks or required to be backed by unrealistically high levels of collateral or guarantees. This issue is more pronounced when borrowers request off-balance sheet or non-recourse project-based loans, which most commercial banks are still unwilling to provide for this type of activity.

19. Especially, difficulties in obtaining financing for large energy efficiency (EE) investments remain a major barrier for industrial energy consumers to improve their energy efficiency. The absence of suitable mechanisms to address the various risks associated with large industrial EE projects, as well as the lack of suitable experience in structuring such projects, continues to constrain domestic banks from providing credit in a systematic, pro-active and large-scale way for large industrial EE projects. Without more proactive involvement of domestic banks in energy efficiency financing, substantial gains cannot be achieved quickly. Furthermore, without proper technical assistance, the domestic banking sector will not be able to confidently play the active role required.

Government programs in energy efficiency

20. The GOC has placed high priority to promoting expanded investment in EE projects and technologies for environmental, macro-economic and enterprise competitiveness reasons. Aided by the implementation of an Energy Conservation Law passed in 1997, the Government has been 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 plants. A revised *Energy Conservation Law* is in preparation and planned to be submitted to the National People’s Congress (NPC) for approval in 2007

21. Recently, GOC responded aggressively to China’s energy efficiency challenge. In November 2004, the National Development and Reform Commission (NDRC) issued the nation’s first *Medium and Long Term Energy Conservation Plan* (up to 2020) which highlights ten energy efficiency programs mainly targeting the country’s major energy intensive sectors for energy efficiency improvements. The 11th Five Year Plan for Economic and Social Development (2006-2010) endorsed by the People’s Congress in March 2006 incorporates major objectives of energy conservation, including: 1) significant increase in overall energy efficiency, in major industries and for the major products, for which the unit output energy use will reach or be close to the leading level in the world at the time of early 21st century; 2) build robust energy conservation systems including supportive law and standards, policy, technical service, inspection and management, which are compatible and consistent with the socialist market economy; and 3) emphasize a new, market-oriented growth model that also is much more energy

efficient and environmentally friendly. More importantly, the GOC made an important pledge in its 11th Five Year Plan to reduce energy intensity to GDP by 20% from 2005 to 2010.

22. While GOC expects structural changes in the economy with an increased role for the service sector to contribute to roughly two-thirds of the energy intensity reduction target, it has emphasized that a significant part will need to come from technical improvements, especially in energy-intensive industrial sectors. As a result, NDRC launched the “*1000 Large Industrial Enterprises Energy Conservation Program*” in April 2006, targeting the top 1008 largest industrial energy consumers in China who account for approximately 33 percent of China’s total primary energy consumption. These enterprises are from nine energy intensive industries: steel, non-ferrous metallurgical, coal-mining, electricity, petrochemical, chemical, construction materials, paper, and textile industries. The government efforts also include a series of policy initiatives to foster technology development and dissemination, and to provide various fiscal incentives. However, without measures to overcome the financial barriers and a proactive development of energy efficiency financing market, hardly massive potentials in energy efficiency improvement among existing industrial facilities can be realized.

Bank’s involvement in energy efficiency

23. The Bank is implementing the GEF-funded First and Second China Energy Conservation Projects to support small and medium sized commercial energy conservation projects by removing financing, technical and policy barriers through the introduction of a performance-based contracting mechanism. These two projects have been implemented successfully and have resulted in significant increases of commercial financing to the targeted energy efficiency (EE) projects and the development of energy efficiency service industry in China. The projects, however, do not cover the large EE investment market, which represents a large share of the total energy efficiency market and has unique characteristics that separate it from the energy management contract financing business.

24. China’s banking sector has started to emerge from a decade-long process of reform to a market-based banking system. The Bank started to provide technical assistance to domestic banks for EE financing in 2003 under the Bank implemented “Three Country (Brazil, China and India) EE financing TA”¹². After three years of extensive consultation with various domestic banks, it is believed that domestic banks can increase lending to large energy efficiency projects rapidly and substantially with proper support in terms of technical assistance and lines of credit to launch new lending programs.

25. The mainstreaming of large-scale EE financing requires a two-pronged approach of demonstration projects at the domestic bank- and enterprise-level complemented by the development of a policy regime at the macro level. The Bank is uniquely positioned to provide GOC with this support given its over two decades’ close working relationship with GOC and successful experience in integrating EE financing with GOC’s policy agenda, as well as its global energy efficiency financing experience.

¹² The multi-year technical assistance project “development of financial intermediation mechanisms for energy efficiency investment in Brazil, China and India”, financed by the United Nation Foundation and implemented by the World Bank through ESMAP and the United Nations Environment Program.

Annex 2: Major Related Projects Financed by the Bank and/or other Agencies

EAST ASIA AND PACIFIC: China Energy Efficiency Financing

Sector Issue	Project	OED rating	Latest Supervision (PSR) Ratings (Bank-financed project only)	
			Implementation Progress (IP)	Development Objective (DO)
Bank-GEF-financed				
Energy-efficiency and environmental improvements	Heat Reform and Building Energy Efficiency			
Energy-efficiency and environmental improvements	Energy Conservation Project		S	S
Energy-efficiency and environmental improvements	Second Energy Conservation Project	NA	S	S
Energy-efficiency and environmental improvements	Efficient Industrial Boilers	NA	S	S
Energy-efficiency and environmental improvements	Shandong Environment Project	NA	S	S
Other Development Agencies				
Energy-efficiency and environmental improvements	UNDP China: End-Use Energy Efficiency Project (EUEEP)	NA	NA	NA

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

1. The project has been developed and will be implemented in close coordination with the on-going energy efficiency related international assistance program in China, thereby maximizing knowledge-sharing and incorporating lessons learned into project design. The First and Second China Energy Conservation projects focus on promoting energy efficiency through the development of energy service company (ESCO) industry in China. The project management office (PMO) which managed the ESCO projects will also provide coordination and implementation support for the project, ensuring real coordination and complementarities to take place between these two projects and the proposed project. The UNEP and ESMAP financed “Three Country Energy Efficiency Project” study on energy efficiency financing mechanism in China, India, and Brazil has been instrumental in the preparation and design of the proposed project.

2. The project will coordinate with and take advantage of the findings from the UNDP GEF China: End-Use Energy Efficiency Project (EUEEP). Specifically, coordination is going to be

around the following activities that EUEEP designed - Component C.3: Policy Development on Energy Efficiency Financing Options, and Component C.2: Implementation of the Energy Conservation Law (ECL). The project is expected to benefit from the Utility-Based Energy Efficiency project which promotes the use of energy efficient equipments. The GEF Industrial Boiler project can make an important contribution to the proposed project through the dissemination of information regarding various environmentally friendly and energy efficient boilers available from Chinese manufacturers.

Annex 3: Results Framework and Monitoring
EAST ASIA AND PACIFIC: China Energy Efficiency Financing

Results Framework

PDO	Project Outcome Indicators	Use of Project Outcome Information
<ul style="list-style-type: none"> Improve energy efficiency in medium and large-sized enterprises of energy-intensive industries. Reduce climate-change impact of medium and large-sized enterprises of energy-intensive industries. 	<ul style="list-style-type: none"> Average energy intensity of national key manufacturing facilities Cumulative avoided CO₂ emissions from national key manufacturing facilities 	<p>YR2-YR3: determine if project assistance strategies/activities need to be adjusted</p> <p>YR5: feed into strategy for sustaining energy efficiency improvement in medium and large-sized enterprises.</p>
Intermediate Outcomes	Intermediate Outcome Indicators	Use of Intermediate Outcome Monitoring
Component A: Promotion of Energy Efficiency Financing <ul style="list-style-type: none"> Energy efficiency lending business line established and sustained at PFIs Government EE-financing programs strengthened 	<ul style="list-style-type: none"> EE financing demand of projects in the project pipeline EC investment preparation procedures and financing modalities piloted EC investment monitoring and evaluation procedures developed 	<p>YR1-YR2: low levels may flag weak business development capacity at PFIs</p> <p>Y3: introduce necessary adjustments in assistance strategy and activities</p> <p>Y5: feed into strategy for sustaining and scaling up EE lending to energy-intensive manufacturing industries</p>
Component B: Energy Conservation Investment Lending <ul style="list-style-type: none"> Increased energy efficiency investment in energy-intensive manufacturing industries 	<ul style="list-style-type: none"> Cumulative amount of energy efficiency lending of participating banks Cumulative energy consumption avoided from the EE lending of participating banks Cumulative avoided CO₂ emissions resulted from the EE lending of participating banks 	<p>Same as above</p>
Component C: National Policy Support and Capacity Building <ul style="list-style-type: none"> Establishment and operation of National Energy Conservation Center (NECC) 	<ul style="list-style-type: none"> Establishment and functional operation of NECC NECC business plan and initial work program developed 	<p>YR1-YR5: monitor implementation progress to determine whether assistance is effective and approaches are realistic. Necessary adjustments made to meet policy and</p>

<ul style="list-style-type: none"> Accelerated implementation of priority EC programs of the 11th Five-Year Plan 	<ul style="list-style-type: none"> Mid-term review of programs conducted and recommendations made. Necessary actions taken to enhance results 	<p>institutional development objectives.</p>
<p>Component D: Project Implementation Support and Reporting</p> <ul style="list-style-type: none"> Efficient implementation of China Energy Efficiency Financing Project 	<ul style="list-style-type: none"> Project targets and delivery schedule met 	<p>YR1-YR5: monitoring overall project progress and specific deliverables to determine efficiency of project coordination. Adjustment made to ensure project targets and milestones are met.</p>

		Target Values					Data Collection and Reporting		
Project Outcome Indicators	Baseline 2006	YR1	YR2	YR3	YR4	YR5	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
<ul style="list-style-type: none"> Average energy intensity of national key manufacturing facilities 	100 (average index)	100	99	98	96	94	Annual report	National Statistics NDRC reports	PMO
<ul style="list-style-type: none"> Cumulative avoided CO₂ emissions from national key manufacturing facilities 	0 (million tons of CO ₂)	0	16.7	33.4	66.8	100	Annual report	National Statistics NDRC reports	PMO
Intermediate Outcome Indicators									
Component A: Promotion of EE Financing <ul style="list-style-type: none"> EE financing demand of projects in the project pipeline 	0 (million USD)	70	150	150	150	150	Annual report	PFI records	PFI
<ul style="list-style-type: none"> EE investment preparation procedures and financing modalities piloted 	NA		1-2 pilot projects prepared	1-2 pilot projects completed				Project reports	PMO
<ul style="list-style-type: none"> EE investment monitoring and evaluation procedures developed 	NA		Draft	Final draft				Project reports	PMO
Component B: EC Investment Lending <ul style="list-style-type: none"> Cumulative amount of EE lending of PFIs 	0 (million USD)	40	120	240	320	400	Annual report	PFI records	PFIs
<ul style="list-style-type: none"> Cumulative energy consumption avoided from the EE lending of participating banks 	0 (million tons of coal equivalent)	0.16	0.48	0.96	1.28	1.60	Annual report		
<ul style="list-style-type: none"> Cumulative avoided CO₂ 	0	0.39	1.18	2.34	3.12	3.90	Annual report		

emissions from EE lending of PFIs	(million tons of CO ₂)								
Component C: National Policy Support and Capacity Building <ul style="list-style-type: none"> Establishment and functional operation of NECC NECC business plan and initial work program developed Mid-term review of 11th Five-year Plan programs conducted and recommendations made. Necessary actions taken to enhance results 	NA NA	 Draft Review carried out	NECC formed staffed Final Draft				Annual report	NDRC documents Project reports Project reports	PMO
Component D: Project Implementation Support and Reporting <ul style="list-style-type: none"> Project targets and delivery schedule met 	NA		Mid term review				Semi-annual report	Project reports	PMO

Annex 4: Detailed Project Description

EAST ASIA AND PACIFIC: China Energy Efficiency Financing

Component A: Promotion of Energy Efficiency Financing (estimated cost: US\$16.65 million; proposed financing: GEF \$9.9 million). This component will support scaling up energy conservation investments at medium and large-sized enterprises in energy-intensive industries. The main activities include

A1: Assistance to PFIs (indicative cost US\$11.15 million, including GEF \$6.3 million and PFIs \$4.85 million) in (a) business start-up; (b) capacity building; (c) marketing and pipeline development; (d) subproject due diligence; (e) financial products development; and (f) output-based incremental cost support.

(a) Assistance in business start-up (GEF \$600,000; PFIs \$600,000) will include international and local consultant services to the three PFIs for

- Creation, organization, staffing, procedures, and initial business plan of the energy-efficiency business unit; and
- Definition, assessment and due diligence of projects to be financed with IBRD funds, as well as on-the-job training for staff in the new EE business unit.

(b) Assistance in capacity building (GEF \$900,000; PFIs \$700,000) will offer

- Common training for PFIs (GEF \$500,000; PFIs \$400,000), including (i) familiarization with energy, energy efficiency and CDM markets and businesses; (ii) appraisal of energy efficiency projects and familiarization with government guidelines; (iii) risk management, financial instruments and hedging instruments; and (iv) visit to one or two countries with successful EE financing institutions.
- Specific trainings for PFIs (GEF \$300,000 grant; PFIs \$300,000), including (i) training with focus on specific sectors of interests to individual PFIs; and (ii) special sector analyses/studies.

(c) Marketing and pipeline development assistance (GEF \$750,000; PFIs \$850,000) will support dissemination and replication of successful activities, awareness programs targeting clients with large potential savings, as well as covering part of the energy auditing cost of complicated EE investment projects involving production process energy optimization

(d) Subproject due diligence support, including financial, technical, social and environmental assessment (GEF \$1,200,000; PFIs \$550,000)

(e) Development of energy conservation-related financing instruments and risk management tools (GEF \$300,000; PFIs \$200,000); and

(f) Output-based payment scheme linked to energy conservation lending to cover part of the incremental operational cost incurred by the PFIs to maintain

a functioning EC business unit or team during the project period as mandated by the project (GEF \$2,550,000; PFIs \$ 1,950,000).

A2: Assistance to other banks (indicative cost US\$1,600,000, including GEF \$800,000; Other banks \$800,000). The proposed project will also provide technical assistance to two additional domestic banks in (a) business start-up; (b) capacity building; and (c) due-diligence requirements. These activities will learn from the successful experience of the PFIs and will start at later phase of the proposed project.

(a) Business start-up support (GEF \$300,000; Other banks \$300,000) will include (i) international and local consultant services for the creation, organization, staffing, procedures, and initial business plan for energy-efficiency lending; and (ii) marketing and pipeline development.

(b) Capacity building (GEF \$300,000; Other banks \$300,000) will include (i) familiarization with energy, EE and CDM markets and businesses; (ii) appraisal of EE projects and familiarization with government guidelines; (iii) risk management, financial instruments and hedging instruments.

(c) Assistance for due-diligence (GEF \$200,000, Other banks \$200,000) will focus on helping the banks meet the due-diligence requirements for the subprojects (up to 4) through experts (technical, environmental for examples) advice for subproject appraisal and on-the-job training for relevant staff.

A3: Assistance to overall banking sector (indicative cost US\$300,000, GEF). This will include information dissemination through national workshops to present successful case studies in first one or two years of subprojects carried out by PFIs, as well as EE business financing products and technologies. The workshop will also have sessions to disseminate guidelines for assessing and developing EE sub-projects.

A4: Assistance for EE project demonstration (indicative cost US\$3.6 million, including \$2.50 million, GEF; \$0.4 million, PFIs; and \$0.7 million, GOC). This subcomponent will support the implementation of the 10 priority national energy conservation programs, focusing on EE investment project preparation, assessment, supervision and monitoring.

(a) Preparation work for 2 or 3 pilot projects (\$1.8 million, GEF; \$0.4 million, participating banks), providing assistance in feasibility studies, including technical, institutional, financial and environmental aspects, and in securing financing for implementation. The objective is to demonstrate effective business model(s) for preparation and implementation of projects in sector(s) with large replication potentials but with significant project development difficulties.

(b) Development of an assessment, supervision and monitoring system of government supported/co-financed industrial energy conservation projects (\$700,000, GEF; \$700,000, GOC), including

- Development of methodology for assessment and supervision of industrial energy conservation projects, including definition of baseline and performance indicators;
- Preparation of a “energy conservation investment handbook” to facilitate and improve the quality of project preparation at industrial enterprises; and
- Training programs and training of the provincial “trainers.”

Component B: Energy Conservation Investment Lending (estimated cost US\$571.4 million; proposed financing: IBRD \$200.00 million, PFIs \$200 million, beneficiary enterprises \$171 million, and GEF \$0.4 million). This component include a total of US\$400 million EC investment lending over five years, a corresponding US\$171 million equity investment by beneficiary enterprises, and EC investment lending monitoring and verification activities:

B1. Energy conservation lending by PFIs (\$200 million IBRD loan and \$200 million PFIs’ own resources). The proposed IBRD loan will be on-lent by the GOC to two to three domestic banks,¹³ which in turn will lend the funds to industrial enterprises (regardless of ownership) for energy conservation investment sub-projects. The PFIs, will be allocated IBRD funds in the range of US\$50-100 million each (final allocation to be determined at project appraisal). PFIs will be responsible for loan repayment to the GOC, and will assume all financial risks. PFIs will lend at commercial rates and in accordance with their own lending policies. The PFIs have also preliminarily agreed to lend at least another US\$200 million for energy efficiency investments from their own resources. It has been agreed that their formal commitments will be submitted to the Bank before project negotiation. The subproject beneficiary enterprises are also expected to contribute 30 percent equity investment, a standard requirement by Chinese banks, totaling US\$171 million.

The eligible subprojects will include medium and large-scale energy conservation investments in which the primary incremental benefits are cost savings associated with reduced energy consumption. PFI financing will target energy efficiency enhancing rehabilitation and renovation subprojects in energy-intensive industries such as, but not limited to, iron & steel, petrochemicals and chemicals and construction materials. It is expected that the energy conservation subproject investments will be in the range of US\$5 – 25 million with the subproject sponsor contributing no less than 30% of the investment cost. Subprojects whose incremental benefits are primarily derived from capacity expansions or non-energy related cost savings will not be eligible for financing. PFIs will follow procedures, guidelines and conditions outlined in energy efficiency lending operational manuals developed by each PFI and agreed by the World Bank.

¹³ Currently include China Development Bank (CDB), Huaxia Bank (Huaxia) and China Export and Import Bank (Exim). The final selection will be determined in consultation with GOC during appraisal stage.

During the implementation of the project, PFIs' project staff will be trained to identify potential carbon financing (CF) candidates from their subproject pipelines. PFIs will make sure that GEF assistance will not directly support any activities related to the implementation of carbon financing for the identified subprojects. However, the PFI project staff will maintain full transparency with its carbon finance counterparts with regards to GEF support for the identified subprojects. It has been agreed that prior review by the World Bank will be required for any subprojects eligible and applied for carbon financing from the funds managed by the World Bank. The prior review will assess if the agreed due diligence process is strictly followed

B2. Monitoring and verification of EC lending (\$400,000, GEF): independent verification of EC lending for the disbursement of the out-put based incentive grant, as well as monitoring of EC subproject performance.

Component C: National Policy and Institutional Support (estimated cost: US\$7.80; proposed financing: GEF \$2.80 million, and GOC \$5.0 million). This component is designed to strengthen government capabilities to implement national energy-efficiency policies and programs through

C1: Assistance to the Proposed National Energy Conservation Center (GEF \$2.05 million; GOC \$5.0 million). The State council approved the creation of a National Energy Conservation Center in August 2006. The main objective of NECC is to support the implementation of national energy conservation policies and programs. NECC is expected to be established and staffed in the next two years, with GOC budget support. This subcomponent will provide organizational and strategic planning assistance to the establishment of NECC, as well as help develop initial work programs of NECC. The proposed activities include

(a) NECC Start-Up (GEF \$300,000; GOC \$2.6 million) – develop vision, organizational structure, functional responsibilities and procedures based on international best practices, including coordination of provincial energy conservation centers, and 3-year work program (2008-2010).

(b) Capacity Development (GEF \$1.30 million; GOC \$2.4 million) – design and implementation of a capacity building/training program and 3-year twinning cooperation with comparable institutions of other countries.

(c) Development of Consumer/Civil Society Awareness Programs (\$250,000, GEF).

(d) Assessment of “Energy Auditing Industry” and recommendations to promote/strengthen it (\$200,000, GEF).

C2: Assistance to the implementation of priority EC programs (GEF \$750,000). This subcomponent will assist the government address issues arising during the implementation of the 11th Five-year Plan, including:

(a) Mid-term review (2008) of 11th Five-year Plan and recommendation of remedy measures (\$250,000, GEF), including independent review of mid-plan achievements, identification of remedy measures, preparation of mid-plan adjustments, selection of priority remedy measures, and immediate implementation of recommended measures;

(b) Special studies to address specific needs that will arise (\$300,000, GEF); and

(c) Adoption of international best practices (\$200,000, GEF) in national priority energy conservation programs. This will involve specific country studies and high-level dialogues. It is proposed to select four countries, preferably with contrasted policies and different institutions. International consultants will prepare country visits for 3-day training and 2-day field trip and policy dialogues. This learning will be applied to mid-plan review and adjustment of national energy efficiency policy framework.

Component D: Project Implementation Support and Reporting (estimated cost: US\$800,000; proposed financing GEF \$400,000, PFIs \$300,000. and GOC \$100,000).

Due to the scale and complexity of the project, GEF support is proposed to assist the government in project implementation support, monitoring and evaluation. This will include (a) recruitment of consultants (GEF \$390,000; PFIs 110,000) to support project implementation, including coordinating technical assistance activities to the banks and the government, as well as organizing project monitoring, evaluation, and reporting activities; and (b) incremental operating costs (GEF \$10,000; PFIs 190,000; and GOC \$100,000), such as office rental, basic equipment, utilities, and travel.

Annex 5: Project Costs
EAST ASIA AND PACIFIC: China Energy Efficiency Financing

Project Costs by Component
(US\$'000,000)

Component	Local	Foreign	Total
Component A: Promotion of EE Financing			16.65
A1: Assistance to PFIs			11.15
A2: Assistance to other banks			1.60
A3: Assistance to the overall banking sector			0.30
A4: Assistance to EC project demonstration			3.60
Component B: Energy Conservation Investment Lending			571.40
B1: EC lending by PFIs			400.00
Matching equity investment by enterprises			171.00
B2: Monitoring and verification of EC lending			0.40
Component C: National Policy and Capacity Building			7.80
C1: Establishment of National Energy Conservation Center			7.05
C2: Implementation of priority EC programs			0.75
Component D: Project Management and Reporting			0.80
Total Project Costs			596.65
Total Financing Required			596.65

Project Financing by Component
(US\$'000,000)

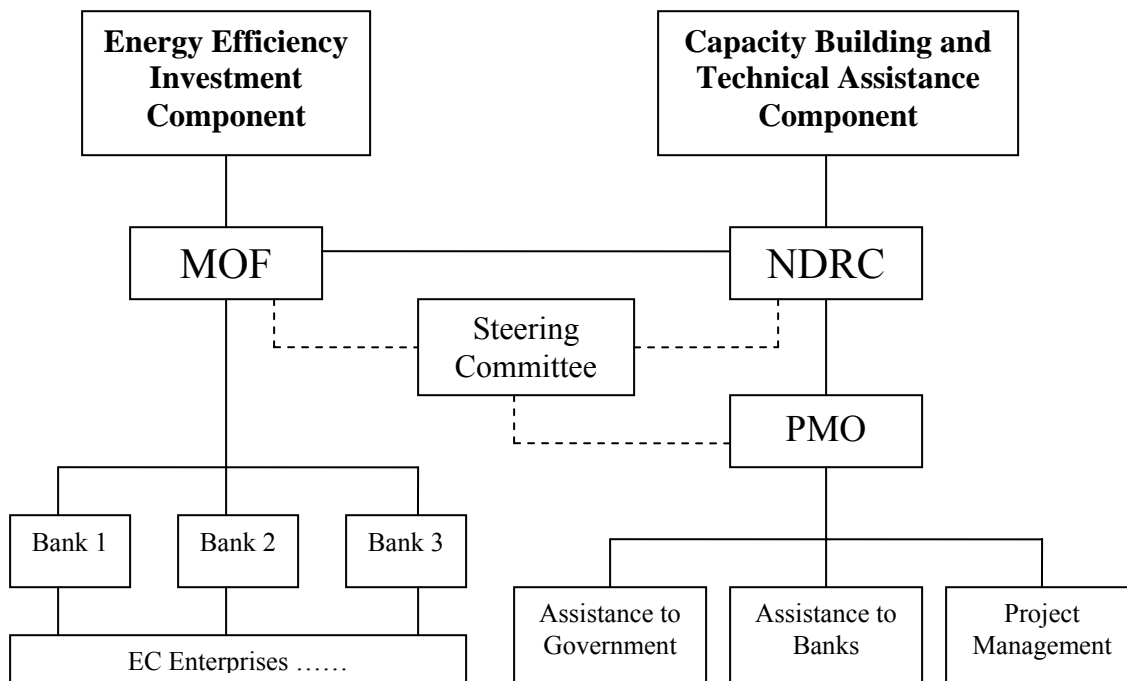
Component	IBRD	GEF	PFIs or Other Banks	Benefi ciary enterp rises	GOC	Total
Component A: Promotion of EE Financing		9.90	6.05		0.70	16.65
A1: Assistance to PFIs		6.3	4.85			11.15
A2: Assistance to other banks		0.80	0.80			1.60
A3: Assistance to the overall banking sector		0.30				0.30
A4: Assistance to EC project demonstration		2.50	0.40		0.70	3.60
Component B: Energy Conservation Investment Lending	200.00	0.40	200.00	171.00		571.40
B1: EC lending by PFIs	200.00		200.00			400.00
Matching equity investment by enterprises				171.00		171.00
B2: Monitoring and verification of EC lending		0.40				0.40
Component C: National Policy and Capacity Building		2.80			5.00	7.80
C1: Establishment of National Energy Conservation Center		2.05			5.00	7.05
C2: Implementation of priority EC programs		0.75				0.75
Component D: Project Management and Reporting		0.40	0.30		0.10	0.80
Total Financing Required	200.00	13.50	206.35	171.00	5.80	596.65

Annex 6: Implementation Arrangements

EAST ASIA AND PACIFIC: China Energy Efficiency Financing

Overview

1. The proposed project will be implemented over five years. It has two parallel tracks of closely related activities that require difference types of attention: Track 1—Energy Efficiency Lending and Technical Assistance to PFIs corresponding to Component B, and A (1), and Track 2—Capacity Building and Technical Assistance corresponding to Components A (2), A (3), A (4), C, and D. PFIs will be responsible for the implementation of activities under Track 1. NDRC will be responsible for the implementation of activities under Tract 2. A PMO will be established under NDRC to manage the project activities under Track 2 on behalf of NDRC. In addition, a Steering Committee comprising representatives of the MOF and NDRC will provide policy guidance to PFIs and other stakeholders for project implementation.
2. The organizational structure for project implementation is presented below, and detailed institutional arrangements are described accordingly.



Track 1: Energy Efficiency On-lending

3. The Ministry of Finance will pass the funds to the Participating Financial Institutions (PFIs) which include China Development Bank (CDB), China Export & Import Bank (Exim) and China Huaxia Bank (Huaxia), in accordance with the on-lending agreements to be signed between the MOF and PFIs. The PFIs will be responsible for implementation of this component of the project based on its commercial practice.

4. Funds would be used by the PFIs to make loans to industrial enterprises for energy conservation projects selected based on the basis of agreed upon criteria and meeting due diligence requirements. Due diligence methodology and activities are discussed in detail in operation manuals prepared by the PFI and provided to the Bank during pre-appraisal. The PFIs would bear all the risks associated with repayments of the IBRD loan to the MOF. They would also be responsible for monitoring and evaluating the implementations of the project activities to be implemented by them.

5. The PFIs will assess potential sub-borrowers and sub-projects based on prevailing commercial practice and the banks' loan appraisal procedures. In addition, an Operational Manual will be prepared by each PFI to meet Bank safeguards and fiduciary requirements with special focus on financial management and environment. The manuals will be provided to the Bank for review prior to appraisal and will be agreed with the Bank before negotiation.

6. A management team in CDB, a new division in Exim Bank and a new unit in Huaxia Bank will be established to take the lead in energy efficiency business start-up, promotion and implementation. They will also responsible for the coordination with the PMO on technical assistance activities to the banks.

Track 2: Capacity Building and Technical Assistance

7. The National Development and Reform Commission (NDRC) will be responsible for coordination of the implementation of the project activities under this Track, in coordination with the MOF and other agencies and research units. The NDRC currently maintains a Project Management Office (PMO) which has been effectively conducting project coordination activities for the first and second China Energy Conservation Project. Coordination responsibilities for the proposed project will also be undertaken by the same PMO. Project implementation responsibility for this component will reside with the PMO, which will coordinate with the selected domestic banks, national and provincial government bodies and other relevant stakeholders.

8. Under the guidance of NDRC, the PMO will undertake the overall coordination, supervision and management of the Grant, and reports to the Bank, MOF and NDRC periodically about project progress and existing problems, with subsequent recommendation of remedy actions. The PMO will be responsible for selection of consultants, including preparation of terms of reference, advertising, shortlisting, issuing requests for proposals, evaluation of proposals, negotiating with selected consultants and contracting with those who have been selected. The PMO will also responsible for maintenance of accounting and management information systems, progress reporting to both GoC and the Bank, conducting outreach and liaison and monitoring and evaluation. The staff of PMO will consists of a Director, Executive Director, Financial Manager, technical experts and 2-3 assistants. The Director could be one government officer from NDRC who will lead the project management activities. The Executive Director will be a full time supervisor of PMO who will conduct specific management work with the Director's guidance.

Annex 7: Financial Management and Disbursement Arrangements

EAST ASIA AND PACIFIC: China Energy Efficiency Financing

Executive Summary

1. The Financial Management Specialist (FMS) has conducted an assessment of the adequacy of the project financial management system of the China Energy Efficiency Financing Project (the project). The assessment, based on guidelines issued by the Financial Management Sector Board on November 3, 2005, has concluded that the project meets the minimum Bank financial management requirements, as stipulated in BP/OP 10.02. In the FMS' opinion, the project will maintain adequate financial management arrangement acceptable to the Bank and, as part of the overall arrangements that the borrower has in place for implementing the operation, provide reasonable assurance that the proceeds of the loan and Global Environment Fund (GEF) grant will be used for the purposes for which the loan and GEF grant are granted. Financial management risk is the risk that World Bank loan proceeds will not be used for the purposes intended and is a combination of country, sector and project specific risk factors. Taking into account the risk mitigation measures proposed under the project, the FM risk rating proposed for this project during the appraisal stage is moderate. **[pending on conclusion]**

2. Funding sources for the project include Bank loan, GEF grant and counterpart funds. The Bank loan proceeds will flow from the Bank into a project designated account (DA) to be set up at and managed by the Investment Evaluation Center (IEC) of Ministry of Finance (MOF), to various Participating Financial Institutions (PFIs), and finally to contractors or suppliers. The GEF grant will flow from the Bank into another DA to be set up at and managed by the MOF IEC for the GEF grant and finally to contractors or suppliers. The Bank loan agreement will be signed between the Bank and the People's Republic of China through its Ministry of Finance (MOF), and on-lending agreements for the Bank loan will be signed between MOF and the eligible PFIs. The GEF grant agreement will be signed between the Bank and the People's Republic of China through its Ministry of Finance (MOF). Counterpart funds will be commercial bank loans.

No outstanding audits or audit issues exist with any of the implementing entities involved in the proposed project. However, the task team will continue to be attentive to financial management matters during project supervisions.

Summary Project Description

4. The development objective of the proposed project is to improve energy efficiency and reduce greenhouse gas (GHG) emissions in medium and large energy consumers in energy-intensive industries and commercial building sectors by (1) developing sustainable energy efficiency lending programs in selected banks to support large-scale energy efficiency investments in these industries; and (2) strengthening government capability to enforce related law, regulations and standards, and to supervise and monitor energy efficiency related activities.

5. The main components of the project consist of (i) intermediary energy efficiency lending; (ii) assistance to the PFIs on energy efficiency business development; (iii) national policy support and capacity building; and (iv) project management, monitoring and evaluation.

6. The estimated cost of the proposed project is USD [] million. The proposed Bank loan and GEF grant amount is USD200 million and USD13.5 million, respectively. The counterpart funding is USD [] million.

Country Issues

7. To date, no CFAA has been performed for China, though dialogue with the Government of China in respect of the CFAA exercise has been initiated. The Bank has relied on a similar exercise carried out by the Asian Development Bank in 2000 for reference.

8. However, based on observations of developments in the areas of public expenditures, accounting and auditing, and Bank experience with China projects for the past few years, we noted that substantial achievement in the aforementioned areas has been made and further improvement is expected in the next few years. As economic reform program further unfolds, the Government of China has come to realize the importance of establishing and maintaining an efficient and effective market mechanism to ensure transparency and accountability, and minimize potential fraud or corruption.

9. Due to rather unique arrangement by the Government of China, funding (particularly Bank loan) of Bank projects is controlled and monitored by the MOF and its extension, (i.e. finance bureaus at provincial, municipal/prefecture and county level). However, project activities are usually carried out by implementing entities of a specific industry or sector due to the level and complexity of expertise involved. The above arrangement then usually requires more coordination on the project, as the multi-level management of the funding and implementation mechanism sometimes works to the detriment of smooth project implementation.

Risk Assessment and Mitigation

10. The following risks with corresponding mitigating measures have been identified during the assessment:

TABLE A7.1. RISK ASSESSMENT AND MITIGATION

Risk	Risk Rating	Incorporated Risk Mitigating Measures	Conditions of Negotiations, Board or Effectiveness
Inherent Risk			
• Country level	Modest	See the following mitigating measures utilized in the project.	
• Entity Level	Modest	Some financial staff of PFIs is new to Bank financed projects although some PFIs have experience with Bank financed project, a well designed training session should be provided to	

		<p>them during launch workshop.</p> <p>Detail financial management and disbursement procedures should be documented in the project financial management manual.</p>	<p>Yes. Completed FM Manual will be an effectiveness condition [pending]</p>
• Project Level	Modest	See the mitigating measures addressed in control risk area below.	
Control Risk			
• Budgeting	Modest	The FMS will work with the PFIs and China Energy Efficiency Project Management Office (EE PMO) to improve their budgeting, execution and monitoring.	
• Accounting	Modest	Accounting policies and procedures for the Bank loan and GEF grant are already in place. Checking by the task team at the initial implementation stage to ensure the accounting system has been correctly set up. This should be followed up by regular supervision missions.	
• Internal Control	Modest	There are some existing internal controls at PFIs although not specifically focused to the project activities. Also, no internal audit arrangement is in place for the project. However, a financial management manual will be prepared and issued to PFIs to uniformly align their financial management arrangement and disbursement requirements. Also, the disbursement documents will be reviewed by Ministry of Finance (MOF) to secure compliance.	
• Funds Flow	Low	The task team will ensure that mechanisms will be in place to ascertain Bank loan and counterpart funds will be released to the ultimate beneficiaries on a timely basis and avoid bottleneck in disbursements.	
• Financial Reporting	Modest	The format and contents of financial statements have been stipulated by MOF and all the PFIs and EE PMO will use them for project financial reporting. The project financial management manual will also establish such financial reporting requirements consistent with MOF's regulations and guidance.	

• Auditing	Low	The external auditor, China National Audit Office, has extensive experience with previous Bank projects.	
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Therefore, the overall FM risk-rating of this project at the appraisal stage is **moderate**. The FMS will monitor the project FM risk during project implementation.

Strengths

11. The China Energy Efficiency Project Management Office (EE PMO) has been managing several World Bank projects such as GEF Energy Conservation Project Phase I and II. They have extensive experience in project financial management and disbursement, which will benefit the implementation of this project.

Weaknesses and Action Plan

12. Since most PFIs do not have experience in Bank-financed projects, a training course will be conducted during the launch workshop on project disbursement and financial management. In addition, existing financial management internal controls at PFIs are not specifically related to the project activities. Thus, a financial management manual will be prepared to uniformly align the project financial management policies at all PFIs. The following action plan for addressing this weakness has been identified:

Significant weaknesses	Actions	Responsible Person	Completion Date
No uniform project financial management arrangement in place at all PFIs.	Financial management manual to be drafted, reviewed by the Bank and finalized and issued to all relevant staff at each PFIs.	EE PMO	Before project effectiveness

Implementing Entity

13. A project steering committee will be established to provide overall policy guidance and facilitate coordination among different agencies on project implementation. The committee will consist of representatives from the MOF and Development and Reform Committee (NDRC).

14. The PFIs will be responsible for implementation of component A. In each PFI, a project team has been established. The PFIs are responsible for daily project implementation of component A. The project accounting and withdrawal applications for the intermediary lending will be managed by each PFI.

15. The EE PMO under NDRC is responsible for implementation of component B, C and D. It has been established and managed Bank financed Energy Conservation I and II

projects. The EE PMO is comprised of director, project officers, procurement officer, financial officer and administration staffs etc.

16. The detailed project organization chart is listed in Annex 6.2.

Budgeting

17. Although the cost table has been prepared for the project and the project will prepare its annual implementing plan, the budgeting system within the project is usually not well maintained or monitored. The FMS will work with the related entities to improve their budgeting system during project implementation.

Accounting

18. 18. The administration, accounting and reporting of the project will be set up in accordance with the Circular #13: "Accounting Regulations for World Bank Financed Projects" issued in January 2000 by MOF. The circular provides in-depth instructions of accounting treatment of project activities and covers the following:

- Chart of account
- Detailed accounting instructions for each project account
- Standard set of project financial statements
- Instructions on the preparation of project financial statements

19. The standard set of project financial statements mentioned above has been agreed between the Bank and MOF and applies to all Bank projects appraised after July 1, 1998 and includes the following:

- Balance sheet of the project
- Statement of sources and uses of fund by project components
- Statement of implementation of loan agreement
- Statement of implementation of GEF grant agreement
- Statement of designated accounts
- Notes to the financial statements

20. EE PMO and each PFI will be managing, monitoring and maintaining their respective project accounting records for the components they execute respectively. Original supporting documents for project activities will be retained by EE PMO and each PFI. In addition, EEPMO and each PFI will prepare their own financial statements, which will then be reviewed, approved and consolidated by MOF IEC before sending to the Bank for review and comment on a regular basis.

21. Adequate project accounting staff with educational background and work experience commensurate with the work they are expected to perform is one of the factors critical to successful implementation of project financial management. Based on discussions, observation and review of educational background and work experience of

the staff identified for financial and accounting positions in implementing entities, the task team note that the financial staff are qualified and appropriate to the work they are expected to assume.

22. To strengthen financial management capacity and achieve consistent quality of accounting work, the task team has suggested that a project financial management manual (the Manual) be prepared. The Manual will provide detailed guidelines on financial management including internal controls, accounting procedures, fund and asset management, withdrawal application procedures, financial reporting and auditing arrangement. The first draft of the Manual will be prepared by the EE PMO and submitted to the Bank by June 30, 2007. The FMS will review and provide feedback where necessary and the Manual will be finalized and distributed to all the relevant financial staff before loan effectiveness.

23. Some PFIs will use computerized financial management information software while some will manually record and maintain the project accounting books. The task team will monitor the accounting process especially during the initial stage to ensure complete and accurate financial information will be provided in a timely manner.

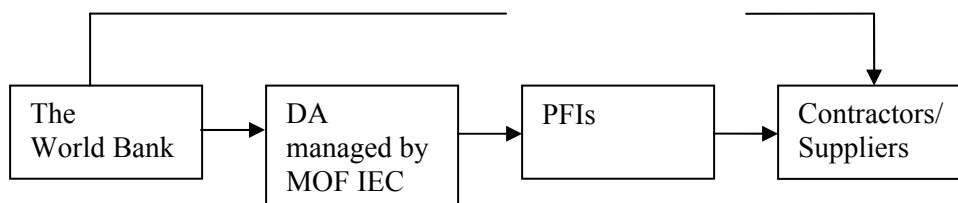
Internal Control and Internal Auditing

24. The related accounting policy, procedures and regulations were issued by MOF and a financial management manual will be prepared and issued by the EE PMO to uniformly align the financial management and disbursement requirements among the different PFIs. The project will followed these documents.

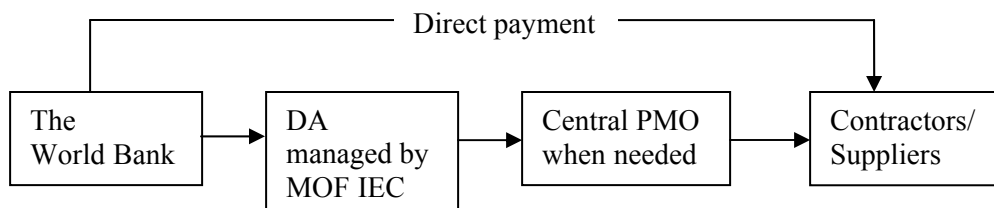
25. There is no formal independent Internal Audit department for the project. However, this will not impact on the project's financial management as EE PMO and each PFI's management and monitoring and annual external audits will serve as the mechanism to ensure that financial management controls are functioning appropriately.

Funds Flow and Disbursement Arrangements

26. Two designated accounts (DA) will be established and managed by MOF IEC. One is for the Bank loan and the other is for GEF grant. The funds flow for the Bank loan is as follows:



27. The funds flow for the GEF grant is as follows:



28. Counterpart funds will be contributions from loans from commercial banks.

29. 27. The Bank loan will be disbursing using report based disbursement. The GEF grant will be disbursing using traditional disbursement techniques and will not be using report-based disbursements.

30. The Bank loan and GEF grant would be disbursed against eligible expenditures as in the following table [pending information].

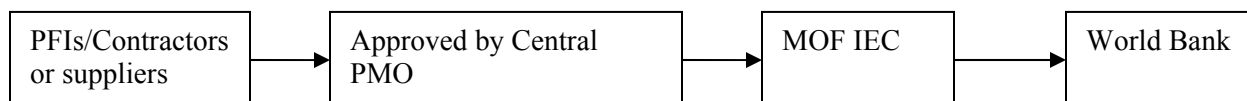
31. Four disbursement methods: reimbursement, advance, direct payment and special commitment are all available for the project. The SOE limits will be set up in line with procurement post review threshold, as follows: (i) all contracts for goods estimated to cost the equivalent of USD [] or less; (ii) consultant contracts estimated to cost USD [] (firm) / USD [] (individual) or less; (iii) all training or workshop costs.

32. Two DAs will be established at MOF IEC. The authorized allocation of DA for the Bank loan will be USD [] million. The authorized allocation of DA for the GEF grant will be USD [] million.

33. MOF IEC will be directly responsible for the management, maintenance and reconciliation of the DA activities of the project. Supporting documents required for Bank disbursements will be prepared and submitted by respective PFIs or EE PMO through MOF IEC for final verification and consolidation before sending to the Bank for further disbursement processing. The flow of withdrawal applications for the Bank loan is as follows:



The flow of withdrawal applications for the GEF grant is as follows:



34. The Bank requires that project financial statements be audited in accordance with standards acceptable to the Bank. In line with other Bank financed projects in China, the

project will be audited in accordance with International Auditing Standards and the Government Auditing Standards of the People's Republic of China. The China National Audit Office has been identified as auditors for the project. Annual audit reports will be issued by above audit center and subject to reviews by the China National Audit Office (CNAO). The Bank currently accepts audit reports issued by CNAO or provincial/regional audit bureaus/offices for which CNAO is ultimately responsible.

35. The annual audit report of project financial statements will be due to the Bank within 6 months after the end of each calendar year. This requirement is stipulated in the loan agreement. The responsible agency and timing are summarized as follows:

Audit Report	Submitted by	Due date
Project consolidated financial statements	EE PMO	June 30 of each calendar year

Conditionality

36. The following actions before effectiveness or disbursement are proposed:

Action	Responsible person	Completion Date
Financial management manual prepared and issued to all relevant staff	EE PMO	Before effectiveness????

Supervision Plan

The supervision strategy for this project is based on its FM risk rating, which will be evaluated on regular basis by the FMS and in consultation with relevant task team leader.

Annex 8: Procurement Arrangements
EAST ASIA AND PACIFIC: China Energy Efficiency Financing

A General

The procurement for the project would be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated May 2004; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated May 2004, and the provisions stipulated in the Loan Agreement. The procurement arrangements are described below.

Energy-Efficiency Lending Component : component A: (US\$421 million, IBRD). Procurement under this component would be carried out in accordance with Paragraph 3.12 (Procurement in Loan to Financial Intermediaries) of the Procurement Guidelines. IBRD Loan would be provided to PFIs through MOF for on-lending to industrial enterprises (regardless of ownership) for energy-efficiency investment sub-projects as sub-loans on commercial lending terms. The sub-loans will range from US\$5 – 30 million with the subproject sponsor contributing no less than 25% of the investment cost for financing energy efficiency enhancing rehabilitation and renovation subprojects in the energy-intensive sectors. Sub-loans from PFIs to the respective beneficiary enterprises would be procured in accordance with the commercial practices. However, considering the ICB may be the most appropriate procurement method for the purchase of large single items or in case where large quantities of goods can be grouped together for bulk purchasing. So, **an ICB threshold US\$ 10 million per contract will be established and each PFI will have PMO to manager ICB as needed. Bank's SBD would be used for ICB.**

Technical Assistance Facility Component (component B, C and D): GEF (US\$13.5 million) and Counterpart funds will finance this component.

Selection of Consultants: Consulting services contracts for Policy making and Technical study and Institutional/Capacity Building Advisors to GOV and PFIs would be needed. In addition to QCBS and QBS, the Selection Based on Consultants Qualifications (CQ) would be used for the consulting contracts which are estimated to cost less than US\$200,000 equivalent per contract. Chinese university, design and research institutes as source of consultants may be included in the shortlist. In such case, QBS or CQ will be used instead of QCBS. Short lists of consultants for services estimated to cost less than US\$300,000 equivalent per contract may be composed entirely of national consultants. Individual consultants if required would be selected and awarded in accordance with the provisions of paragraphs 5.2 through 5.3 of the Consultants Guidelines. Under the circumstances described in paragraph 5.4 of the Consultants Guidelines, individual consultants may be selected and awarded on a sole-source basis, subject to the Bank's prior approval. Single Source Selection would be used for specific cases and prior agreed by the Bank.

Procurement of Goods: Goods procured under this component would include computers, printing services and office equipment under small partial of fund. Considering the goods contracts will be very small, shopping in accordance with the provisions of paragraphs

3.5 of the Guidelines would be used for Goods procurement cost less than US\$100,000 equivalent per contract.

Training and workshops: Training and workshops would be required under the project. Detailed programs would be developed by PMO under NDRC and PFIs during project implementation and included in project annual work plan for Bank's review. Actual expenditures incurred in accordance with the approved detailed programs would be used as the basis for reimbursement.

B. Assessment of the Agency's Capacity to Implement Procurement

A project steering committee will provide overall policy guidance and facilitate coordination among different agencies on project implementation. This committee will be chaired by NDRC and will include representatives from the MOF and related PFIs. This committee is responsible for making of important decision; higher level coordination among the projects parties and supervising the whole project implementation.

A PMO under NDRC (Department of Resources Conservation and Environmental Protection) will be responsible for day-to-day project management and administration matters including financial management, procurement and reporting. 7 staff members have already been recruited and 2 addition staff would be appointed if required during project implementation. In each PFI, a sub-project management office will be established before project negotiation for its sub-project implementation.

An assessment of the capacity of the Implementing Agency to implement procurement of the project was carried out by the World Bank Beijing Office in January 2007. The assessment reviewed its organization structure and functions, past experience, staff skills, quality and adequacy of supporting and control systems. The overall risk for procurement is average.

C. Procurement Plan

At the appraisal stage or even during the implementation of project, it is not possible to determine either beneficiary PFIs or their procurement requirements. Therefore, it is not feasible for PMO to develop a Procurement Plan for Intermediary Energy-Efficiency Lending Component which provides the basis for procurement methods. Instead, an overall implementation arrangement including sub-project selection manual and management manual would be prepared by PFIs and PMO for result monitoring. As for Technical Assistance Facility Component, PMO and PFIs would prepare a procurement plan for consultant services and small Goods procurement. Such Plan would be agreed between the NDRC and the project Team before negotiation and would be available at NDRC and Bank's external website.

D. Review Procedures and Frequency of Procurement Supervision

Prior Review: Due to the nature of the project, all contracts except under Intermediary Energy-Efficiency Lending Component are not subject to prior review, but subject to the Bank's post review on a random basis. Under Technical Assistance Facility Component, all consultant services contracts in excess of US\$100,000 for firms and US\$50,000 for individual consultants would be subject to the Bank's prior review, and the first goods

contract to be procured in PMO and each PFI will be also prior reviewed by the Bank. The rest of contracts are subject to the Bank's post review.

Frequency of Procurement Supervision: The Bank will conduct procurement supervision at least once for the first year and every other year for the remaining project implementation. During procurement supervision, PMO and FPIs should provide all consolidated information for Bank review.

Annex 9: Economic and Financial Analysis

EAST ASIA AND PACIFIC: China Energy Efficiency Financing

A. PARTICIPATING FINANCIAL INSTITUTIONS (PFIS)

1. Three banks (CDB, China Export-Import Bank, and Huaxia Bank) were selected as potential PFIs from six Chinese banks through an initial screening based on agreed-upon criteria between the Bank and the GOC. Subsequently, the Bank performed its financial due diligence of CDB and Huaxia in accordance with the established eligibility criteria (see below) set by Bank Operational Policy and confirmed their preselection as PFIs. The eligibility of these two banks will be reconfirmed during the appraisal mission. In the absence of financial statements prepared and audited in accordance with accounting and auditing principles acceptable to the Bank, it was agreed with Exim that it would undertake Agreed-Upon Procedures on financial statements for the year ended December 31, 2006. Exim's full eligibility will be subject to due diligence review and a time-bound action plan, which will be carried out following the completion of the Agreed-Upon Procedures. CDB and China Export-Import Bank are two of the three state-owned policy banks in China, while Huaxia Bank is a commercial bank established in October 1992. At the end of 2005, CDB and Huaxia Bank had capital adequacy ratio of 10.5 percent and 8.2 percent, respectively, and their ratio of non-performing loans (NPLs) stood at 1.2 percent and 2.8 percent, respectively. Detailed findings from the due diligence of CDB and Huaxia Bank are included below.

B. ELIGIBILITY CRITERIA FOR SELECTION OF PFIS

2. The Bank Operational Policy (OP8.30) requires that all financial intermediaries, which participate in a Bank financed credit line operation, are viable financial institutions at time of project appraisal and throughout the project implementation. The PFIs should be able to meet the established eligibility criteria in order to become a PFI. The due diligence is carried out in accordance with the established eligibility criteria. The eligibility criteria for the PFIs in the China Energy Efficiency Financing Project have been developed based on best practices in the Bank line of credit operations. The criteria set out standard financial performance benchmarks for PFIs to meet in order to participate in the project. These benchmarks are structured to reflect the core areas of a financial institution – capital adequacy, asset quality, management and governance, liquidity, profitability, and efficiency – and are primarily aimed at setting a basic standard of financial health and soundness for eligible PFIs.

General Criteria

- Be in substantial compliance with all the prudential and regulatory requirements of CBRC, acceptable to the Bank.
- Be duly licensed in China to undertake banking operations and at least two years in operations.
- Have an appropriate corporate governance structure that complies with the appropriate regulations, with independence and capacity to provide adequate supervision to management and control over the bank's lending decisions.

- Have financial reports for the past two years, audited by a reputable auditing firm that is acceptable to the Bank, in accordance with International Accounting Standards (IAS) and International Standards for Auditing (ISA).

Financial Criteria

- Be in full compliance with CBRC regulations, including:
 - Have and maintain an IAS calculated risk weighted capital adequacy ratio $\geq 8\%$
 - Non-performing loans to total outstanding loans $\leq 5\%$
 - Single borrower limit: $< 10\%$ of net capital
 - Related/connected borrower limit: $< 15\%$ of net capital as defined by CBRC and in line with international best practice
- Profitable for the current and previous two years as reflected in the IAS audited financial statements.

C. CDB DUE DILIGENCE SUMMARY

3. The financial and operational review of CDB indicates that CDB has:
 - Adequate profitability, capital adequacy, asset quality and liquidity in accordance with accounting and auditing principles acceptable to the Bank.
 - Acceptable levels of subloan collections.
 - Appropriate capacity including staffing for sub-project appraisal and implementation.
 - Appropriate prudential policies, administrative structure and business procedures.

4. **Overview.** CDB is one of the three policy banks in China. Its primary role is to support economic development policies and programs of the government through provision of long-term financing for infrastructure, basic industries and regional development. CDB has the status of a government ministry and enjoys investment grade ratings with the international rating agencies that are in line with China's sovereign rating. The day to day management of operations is overseen by a Governor assisted by four vice governors. In addition, a Board of Supervisors appointed by the State Council and consisting of representatives from the Ministry of Finance and the CBRC, and a designated public accounting firm, provides advice and guidance on strategy and operations.

5. **Business Lines.** Currently, CDB's main line of business is infrastructure financing. Some 95% of outstanding loans are in the infrastructure sector, with the energy, road and water sectors accounting, respectively, for 26%, 22% and 22% of the total. In 2003, in order to support the government's policy objectives of promoting a dynamic small and medium enterprise (SME) sector; CDB launched an SME finance initiative. Under this initiative CDB works with local commercial banks to provide loans to mostly small and medium enterprises. In addition to providing funds, CDB assists local commercial banks in improving their credit risk management and loan administration standards. At the end of 2004, CDB had an SME loan portfolio of about RMB 4.5 billion. CDB recognizes that micro and small enterprises have needs and risk characteristics distinct from SMEs and must be serviced in a different manner.

6. **Review of Financial and Operational Performance.** Summary Balance Sheet, Income Statement and key Performance Ratios for the past three years are presented below. The key findings of the review are as follows:

- CDB has a sound balance sheet with a reasonable level of profitability and good asset quality ratios. (Since 2002 CDB has been publishing its financial statements based on IAS and has been audited by Price Waterhouse and Coopers).
- The financial and operational status of CDB is periodically reviewed by international credit rating agencies and it enjoys an investment grade rating.
- Although as a policy bank CDB's operations are not exclusively motivated by profit considerations, CDB nonetheless has maintained a reasonable level of profitability.
- CDB's Capital Adequacy Ratio at 10.5% meets international norms.
- CDB has a low level of NPLs and these are fully covered by loan loss reserves. This low level was achieved in part by a one-time sale of NPLs to Cinda Asset Management Company in 2000. Most of these NPLs had been inherited from bad loans originated before 1998.
- New NPLs are kept low because CDB has implemented a strict and rigorous multi-tier credit approval and risk control system that ensures that origination, appraisal, rating and monitoring are performed by independent departments. It has also invested in training staff in modern credit appraisal techniques and is currently engaged in bringing its risk control systems in line with international practices.
- CDB has a concentrated loan portfolio both in terms of sectors and borrowers. This is in part by design because it is mandated with a mission to finance infrastructure investments and support regional development.

TABLE A9.1. CDB: SUMMARY BALANCE SHEET (IN BILLIONS OF RMB)

	2005	2004	2003
ASSETS			
Cash & Bank Balances	25.54	28.58	16.14
Loans (Net)	1,711.24	1,389.19	1,120.89
Investments	50.88	44.07	29.89
Fixed Assets	2.67	2.69	2.41
Others	107.61	109.95	109.84
TOTAL ASSETS	1,897.94	1,574.48	1,279.17
LIABILITIES			
<i>Short-Term</i>			
Bank Deposits & Borrowing	66.20	82.17	50.60
Customer Deposits	136.85	95.93	65.74
Others	22.89	14.07	8.99
<i>Long-Term</i>			
Bonds Issues and Outstanding	1,501.19	1,254.83	1,064.41
Subordinate Debt	40.30	20.01	-
Total Owner's Equity of which	130.51	107.47	89.43
Paid-in capital (memo)	50.00	50.00	50.00
Reserves (memo)	7.27	6.33	5.16
Retained Earnings (memo)	73.24	51.14	34.27
TOTAL LIABILITIES	1,897.94	1,574.48	1,279.17

**TABLE A9.2. CDB: SUMMARY INCOME STATEMENT
(IN BILLIONS OF RMB)**

	2005	2004	2003
Net Interest Income	39.98	31.04	24.42
Net Non-Interest Income	0.89	0.29	0.12
Dividend Income	0.52	0.83	1.64
Gains(Losses) on Investments	0.53	2.10	(0.81)
Operating Expenses	(6.77)	(5.08)	(4.27)
Provisions for Credit Losses	(1.36)	(3.59)	(2.83)
Other Income (expenses)	(0.90)	(0.20)	0.20
Profit Before Tax	32.89	25.30	18.47
Income Tax	(10.11)	(7.89)	(5.26)
Net Profit	22.78	17.41	13.21

TABLE A9.3. CDB: KEY PERFORMANCE RATIOS (IN %)
[To be completed]

	2005	2004	2003	2002
Profitability				
PBT/Tot. Av. Assets		2.02	1.84	1.98
Net Income/Tot. Av. Assets		1.22	1.14	1.23
Net Income/Equity		17.68	16.03	17.36
Capital Adequacy				
Equity/Total Assets		6.83	6.99	7.24
Equity/Loans		7.80	8.00	8.60
Capital/Risk Assets		10.50	10.26	11.58
Liquidity				
Liquid & Marketable Assets/Deposits & STL		42.33	42.98	63.91
Asset Quality				
Impaired Loans/Gross Loans		1.18	1.34	1.78
Loan Loss Provision/Profits Before Provisions		11.34	11.65	-6.87
Loan Loss Reserves /Impaired Loans		142.24	140.42	136.52

D. HUA XIA BANK: DUE DILIGENCE SUMMARY¹⁴

7. Hua Xia Bank Co. Limited (HXB) is a commercial bank founded by Shougang Group General Corporation on October 1992. In April 1996, HXB transformed itself into a joint stock company upon approval from the People's Bank of China (PBOC).

8. As of June 30, 2006, 1,560 million shares representing 37.14% of HXB' capital is listed in the Shanghai Stock Exchange (SSE). The remaining 62.86% block of 2,640 million shares is scheduled for future listing in the SSE in several annual tranches beginning June 2007. As of June 30, 2006, out of the non-listed 62.86% of shares, Deutsche Bank Group (DBG) owns a combined stake of 587.2 million shares or 13.98%

¹⁴ Attachments related to the Hua Xia due diligence can be furnished to reviewers upon request and will be included in the project files.

of HXB's capital, making DBG its biggest individual shareholder. Among domestic shareholders, ten state owned companies led by the Shougang Group Corporation, which is fully owned by the State-owned Assets Administration and Regulation Commission of Beijing, hold a combined stake of 44.42% of HXB share capital. Other international shareholders holding a minority stake on listed HXB's shares include Citigroup Global Markets and Credit Suisse (Hong Kong) Ltd.

9. According to the resolution passed at the meeting of the Board of Directors of HXB on October 29, 2006, Mr. Colin Grassie, CEO of Asia Pacific, Deutsche Bank, has been appointed member of the Board of Directors and also member of the Strategic Committee and Risk Management Committee. Besides its investment into HXB's share capital, DBG is also providing HXB with a two year technical assistance package worth an estimated value of 20,000 man/days, providing support on: i) credit and risk management techniques; ii) Information Technology enhancement; iii) overall bank management and strategy; iv) product development; and v) internationalization.

10. Since 2001, HXB has participated as an on-lender on a € 20 million credit line specializing on energy-efficiency investments granted by KfW Entwicklungsbank (KfW), the German development agency. A similar arrangement has also been concluded between the Ministry of Finance of PRC, and the Agence Française de Développement (AFD) of France, appointing HXB as one of the on-lending financial institutions.

11. HXB's annual financial statements for the years 2003 to 2005 were audited by Beijing Jing Du Certified Public Accountants Co., Ltd. and Ernst & Young (Hong Kong) Ltd., respectively, in accordance with Chinese Accounting Standards (CAS) and International Accounting Standards (IAS). The Auditors issued clean/unqualified opinion under both IAS and CAS, with respect to the financial statements prepared by HXB. Each year, HXB publishes a comprehensive Annual Report which is made available to its shareholders, clients and correspondent banks.

Financial Performance

12. HXB's assets structure is considered well balanced. Liquid Assets, which account for one third of total assets as of June 30, 2006, decreased 17.6% from its balance for year ended 2004. This decline is matched by growth of the loan portfolio. Loans and advances to customers make two thirds of total assets with short term loans representing 78.6% of total loans, 18.6% for medium to long term loans and 2.8% for NPLs. Fixed assets are 0.9% with equity investments and other assets taking 1% of total assets.

13. HXB is showing sustainable assets growth, from 25.2% recorded in 2004, to 17.2% in 2005 and 19.7% in annualized terms during the first half of 2006. While the loan portfolio is growing strongly, its NPLs show a slight decline. Provisions for credit losses provided coverage to 72.1% of the NPLs, comparing to the international benchmark of 113% for East Asia countries (Table A9.4) and 92.7% for peer Chinese banks. Having said that, HXB accumulated provisions for loan losses exceeded RMB 457 millions in 2005 with respect to the required regulatory provisions by CBRC (Table A9.11).

14. Earning assets are estimated at 85.5% of total assets which include inter-bank placements, securities for trade, loans and advances to customers (excluding NPLs) and investments & participations with cash, accounts with PBC, correspondent bank accounts, NPLs, fixed and other assets are the remaining 14.5%. Interest bearing liabilities are estimated at 95.2% of total liabilities.

15. The main source of financing HXB's assets comes from deposits taken from customers (Table A9.22), or 88.6% of total liabilities as of June 30, 2006. Customer deposits grew 28.3% in 2004 moderating its pace to 15.7% in 2005 which among peer banks was the second lowest growth rate, and 16.4% in annualized terms for the first half of 2006. As of June 30, 2006, demand and savings deposits represented 37.6% of total deposits, 41.3% were time deposits and 18.2% as deposits pledged as collaterals to loans extended to customers (27.1% of outstanding loan portfolio).

16. HXB issued in 2004 subordinated debt totaling RMB 4.250 billion with a maturity period of six years and PBC's benchmark one year fixed interest rate plus 2.72% to 2.82%. The estimated cost of this debt for 2005 is 5.1%. This quasi equity instrument is used by HXB as supplementary capital to comply with CAR.

17. During 2005 HXB's loan portfolio grew above all its peers but, at the same time, its deposits merely increased by 15.7%, which only surpassed that of Industrial & Commercial Bank (10.8%), falling behind the peer Chinese banks. HXB's growth in customer deposits is considered moderate with respect to levels recorded in 2004 but showing positive progress. Stiffer competition and the need for funding new loans might prompt HXB for the need of improving its retail product line and its capacity for attracting funds from the public. Because of its equity shortage and other third party funding (namely long-term banking credits and bonds), HXB relies heavily on its customer deposits to fund the loan portfolio. The lack of long-term funding is causing treasury to run important maturities mismatches which become critical over the short term (up to 90 days). HXB's loan/deposit ratio stood at 73.3% in 2005 (65.5% in 2004), is highest 12 compared to the peer Chinese banks, with the exception of China Development Bank (CDB), which is also considerably higher compared to International Benchmark of 67.5% for the East Asia Region (Table A9.21).

18. While HXB is running its business profitably, during 2005, however, the ROE (14%) and ROA (0.4%) ranked at the bottom compared to the peer Chinese banks. These low returns could be attributable to a combination of the following factors: i) small contribution of non-interest, fee based income, now stood at 2.5% to total operating income; ii) low level of equity with respect to total assets; and iii) relative high operating expenses to operating income. Please refer to Earnings Section of the report for more discussion.

TABLE A9. 4. BENCHMARKING HXB'S KEY FINANCIAL PERFORMANCE

Key performance ratios*	Dec 2003	Dec 2004	Dec 2005	June 2006	Developed Country Average**	East Asia Region Average**
<i>Asset Quality</i>						
Problem Loans /Loans		4%	3%	2.8%	2.1%	2.9%
Provisions /Problem Loans		61.5%	69.3%	72.1%	80.6%	113.4%
<i>Capital Adequacy</i>						
Capital /Total Risk Weighted Assets			8.24%	8.20%	5.6%	8.8%
<i>Profitability</i>						
Return on Equity	11.2%	11.6%	14.0%	13.8%	12.9%	18.7%
Return on Assets	0.3%	0.4%	0.4%	0.4%	0.8%	1.6%
Net Interest Margin	3.1%	3.0%	2.9%	2.7%	1.8%	3.2%
<i>Liquidity</i>						
Loans /Deposits		65.5%	73.3%		68.4%	67.5%
<i>Efficiency</i>						
Operating Expenses to Operating Income	54.5%	51.9%	52.8%	50.6%	65.4%	64.5%

Sources:

*IAS audited financial statements, Ernst & Young Hong Kong, for 2003, 2004 and 2005. Unaudited financial statements prepared by HXB for period ended June 30, 2006.

** 2004 data obtained from IFC derived Bankscope. EAP data based on an average of 25 banks across 7 countries and Developed Country data based on an average of 43 banks across 12 countries.

Capital Adequacy

19. As of June 30, 2006, HXB's equity totaled RMB 10,743 billion, of which 4,200 billion (39.1%) pertained to share capital, and RMB 6,743 billion (60.9%) were contributed by reserves and unappropriated earnings (Attachment 2). Share capital is divided into 4,200,000,000 shares of 1 RMB each. As of June 30, 2006, 1,560 million shares representing 37.14% of HXB's capital were listed in the Shanghai Stock Exchange (SSE); the market price per share as of June 30, 2006 was RMB 4.51 and its estimated book value RMB 2.56. The remaining 62.86% block of 2,640 million shares is scheduled for future listing in the SSE in several annual tranches beginning June 2007.

20. Capital adequacy is based on CBRC's Regulation Governing Capital Adequacy of Commercial Banks which came into effect on March 1, 2004. HXD's capital adequacy ratio (CAR) stood at 8.20% as at June 30, 2006 and meets the CBRC and international minimum standard according to IAS audited financial statements.

TABLE A9.5. CAPITAL ADEQUACY RATIO

Capital adequacy ratio = net capital/weighted risk asset		(RMB billion)
	Capital adequacy ratio of 2005	Capital adequacy ratio of the first half of 2006
net capital	16.2	17.6
weighted risk asset (sum of A and B)	196.5	214.6
A corporate business		
corporate loans, drafts and others	179.2	189.4
discounted bills	8.5	13.0
B individual business	8.8	12.2
Capital Adequacy Ratio	8.24%	8.20%

21. However, even though the CAR exceeds the minimum standard of 8% set by the CBRC, the current CAR offers HXB very limited room for assets growth, as well as limited protection to underlying credit risk. To improve its CAR, HXB plans to issue subordinated debt for an estimated amount of two billion RMB. The issuance would still keep HXB within the limit set by CBRC. Please refer to footnote 3 for more information.

22. The incremental impact of HXB's capital adequacy ratio on WB credit line of USD 50 million to be on-lent for energy efficiency sub-projects is considered low. The USD 50 million (around RMB 400 million) will require approximately RMB 32 million of regulatory capital which, compared to the current level of 8.20% would only decrease capital adequacy by 0.02% to an estimated figure of 8.18%. Notwithstanding the above, the planned subordinated debt issue of RMB two billion is expected to contribute to HXB's leverage for assets growth with an estimated volume of RMB 60 billion.

TABLE A9.6. HUAXIA BANK CO., LTD BALANCE SHEET

Hua Xia Bank Co., Limited								
Balance Sheet	Periods Under Review							
Amounts in Million RMB '000,000	2.003	%	2.004	%	2.005	%	2.006	%
	Dec 31		Dec 31		Dec 31		June 30	
	AUDITED		AUDITED		AUDITED		Unaudited	
TOTAL ASSETS	242.882	100	304.122	100	356.488	100	391.684	100
CAPITAL	3.500	41,1%	4.200	45,5%	4.200	38,8%	4.200	39,1%
RESERVES	4.877	57,3%	4.043	43,8%	4.847	44,8%	4.502	41,9%
RESERVES FOR GENERAL RISKS	100	1,2%	100	1,1%	900	8,3%	900	8,4%
PROFIT (LOSSES) CURRENT YEAR	0	0,0%	0	0,0%	0	0,0%	0	0,0%
UNAPPROPRIATED EARNINGS	35	0,4%	878	9,5%	866	8,0%	1.141	10,6%
TOTAL EQUITY	8.512	3,5%	9.221	3,0%	10.813	3,0%	10.743	2,7%

23. **Table** A9.6 shows that HXB's Equity to Total Assets ratio of 3.0% (2005) compares unfavorable against the regional benchmark of 6.6%, and peer Chinese banks benchmark of 3.9% for 2004. The Equity to Total Assets ratio as of end of June 2006 declined to 2.7%; meanwhile, during the first half of year 2006, Total Assets grew 19.7% in annualized terms. **Table** A9.7 shows a comparison of Equity to Total Assets ratios of selected Chinese banks, whose information is obtained from its web sites.

TABLE A9.7. EQUITY TO TOTAL ASSETS

Equity to Total Assets (end of period)	2004	2005	June 30, 2006
Hua Xia Bank	3,0%	3,0%	2.7%
China Development Bank (1)	6,8%	6,9%	N/A
Industrial & Commercial Bank (2)	-10,6%	4,0%	N/A
Citic Bank	5,3%	5,1%	N/A
Minsheng Bank	2,9%	2,8%	N/A
Regional benchmark (South East Asia)	6.6%		
Peer Chinese banks benchmark	3.9%		
Developed countries benchmark	6.4%		

Source: Information released in Banks' web sites (English versions)

(1) Policy bank

(2) The bank was transformed from wholly state-owned commercial bank into joint stock limited company on October 28, 2005. The transformation encompassed an equity injection of RMB 124 billion plus the transfer, on a non-recourse basis, to the big four Chinese asset management corporations, of NPLs worth RMB 705 billion. These two decisions contributed substantially to the improvement of ICB's equity ratios compared to total assets and net loans.

24. Despite the fact that HXB is in compliance with CBRC's minimum requirements on capital adequacy and loan loss provisioning, HXB's equity compared to net loans demonstrates (**Table** A9.8) more clearly that the bank's actual equity position might be short if faced with any underlying risks in its loan portfolio.

TABLE A9.8. EQUITY TO NET LOANS

Equity to Net Loans (end of period)	2004	2005	June 30, 2006
Hua Xia Bank	5,2%	4,7%	4.2%
China Development Bank	7,7%	7,8%	N/A
Industrial & Commercial Bank	-17,1%	8,0%	N/A
Citic Bank	10,9%	11,1%	N/A
Minsheng Bank	5,1%	5,0%	N/A
Regional benchmark (South East Asia)	14.1%		
Peer Chinese banks benchmark	7.6%		
Developed countries benchmark	13.5%		

25. An estimation of HXB's equity shortage as of June 2006, when compared against benchmarks of Chinese peer banks, would provide a range between RMB 4.5 billion if measured by equity to total assets ratio and RMB 8.7 billion if equity to net loans ratio is applied. The additional equity of RMB 4.5 billion would raise HXB's capital adequacy ratio to 11.7%.

Asset Quality

26. The structure of HXB's loan portfolio shows an adequately diversified risk among industry sectors, with manufacturing taking one third of the total loan portfolio and loans to other sectors of the economy (consumer, real estate, trading, production) making the remaining two thirds.

27. The loan portfolio is guaranteed and/or secured by mortgages and other collaterals in its 97% for 2005. Mortgages received comprise 28% of the loan portfolio; guaranteed loans 29% and other collaterals the remaining 40%.

28. As for off-balance sheet items, HXB is showing substantial growth (68% in 2005) on the Letters of Guarantee business which, duly priced for the risk involved.

TABLE A9.9. LOAN PORTFOLIO

	Dec 2004		Dec 2005	
	RMB million	%	RMB million	%
Manufacturing	54,197	30%	71,370	31%
Conglomerate	34,710	19%	37,061	16%
Trading	29,809	17%	36,278	15%
Real estate	24,053	13%	28,680	12%
Others	38,343	21%	60,290	26%
Total	181,112	100	233,688	100
Guarantees on Loans and advances				
Guaranteed	47,836	26%	67,155	29%
Secured by mortgages	41,246	23%	65,143	28%
Secured by other collaterals	84,762	47%	95,074	40%
Unsecured	7,268	4%	6,316	3%
Total	181,112	100	233,688	100
Off-balance sheet Items				
Letters of credit issued and Draft acceptances	9,101		8,236	
Letters of Guarantee issued	57,556		96,428	
Total Off-Balance sheet items	66,657		104,664	

29. Loans classified as non-performing (NPLs or Classified) keep their balance relatively stable despite substantial growth in the loan portfolio, reporting a slightly increase of RMB 191 million since 2004. Classified loans declined its share within the

loan portfolio from 4.0% in year 2004 to 2.8% as of 30 June 2006 (Table A9.9). Special mentioned loans showed an improvement during the period in December 2004 to June 2006, both in volume and relative share within the loan portfolio. As of June 30, 2006, specially mentioned loans amounted to RMB 13.5 billion or 5.2% of the loan portfolio with a decrease of RMB 2.6 billion from its level at the end of 2004.

TABLE A9. 10. -----

	2004		2005		2006, June 30	
	Balance outstanding	%	Balance outstanding	%	Balance outstanding	%
	RMB million					
Sub-standard	5,401	3.0	5,300	2.3	4,618	1.8%
Doubtful	1,424	0.8	1,397	0.6	2,536	0.9%
Loss	348	0.2	416	0.1	210	0.1%
1. Total Classified	7,173	4.0	7,113	3.0	7,364	2.8%
Special Mention	16,161	8.9%	14,417	6.2	13,517	5.2%
2. Total criticized	23,334	12.9 %	21,530	9.2	20,881	8.0%
Pass	157,778	87.1 %	212,158	90.8	239,949	92.0
3. Total Loans	181,112	100	233,688	100	260,830	100
4. Provisions for Loan Losses	4,409		4,932		5,310	
5. Total Equity	9,221		10,813		10,742	
a) Classified Loans to Equity (1:5)	77.8%		65.8%		68.5%	
b) Criticized Loans to Equity (2:5)	253.1%		199.1%		194.4%	
c) Classified Loans to Total Loans (1:3)	4.0%		3.0%		2.8%	
d) Criticized Loans to Total Loans (2:3)	12.9%		9.2%		8.0%	
e) Provisions for Loan Losses to Classified Loans (4:1)	61.5%		69.3%		72.1%	
f) Provisions for Loan Losses to Total Loans (4:3)	2.4%		2.1%		2.0%	

30. Provisions for potential loan losses appear to be low despite they are in compliance with the minimum requirements set forth in the Guidelines of Risk-Based Loan Classification, Art. 5, issued on December 24, 2001, and Guidance on Provisioning for

Loan Losses issued on April 25, 2002, by PBOC. HXB's accumulated provisions for loan losses exceeded RMB 457 millions in 2005 and RMB 8 million as at June 30, 2006, with respect to the required regulatory provisions (Table A9.11). However, in principle, prudent banking management would prompt these provisions to cover at least 100% of NPLs plus a proxy of 1% to 2%, estimated at RMB 10,036 billion as of June 30, 2006 with additional charge-off to profit/loss account of RMB 4,726 billion, as coverage for general risks underlying on performing loans outstanding. HXB should assess the feasibility of increasing provisions for loan losses to fully cover NPLs and capital adequacy implications for its viability. An estimation of additional provisioning for substandard and doubtful loans, if applied, the maximum variance ranges (+20%) allowed by the said Art. 5, would require HXB to increase provisions as of June 30, 2006, by RMB 1,425 billion, thus decreasing regulatory net capital to RMB 16.2 billion and CAR falling to 7.55%, below the minimum requirement of 8%. If HXB would have recognized the need for these estimated RMB 1.4 billion additional provisioning, then net profits reported as of 2004 (RMB 1,030 billion) and 2005 (RMB 1,401 billion) would have been overstated.

TABLE A9. 11.

RMB '000,000								
	2004	2005	2006 June 30	CBRC requirements 04-25-2002 Provisioning in %		Estimated Minimum Regulatory provisions		
	LOAN AMOUNT	LOAN AMOUNT		Minimum	Range Art. 5	Provisions 2005	Provisions 2006, June 30	
							Minimum	Maximum , Art. 5
Pass	157,778	212,158	239,949	1%	--	2,121	2,400	2,400
Special Mention	16,161	14,416	13,517	2%	--	288	270	272
Sub- standard	5,401	5,300	4,618	25	+20%	1,325	1,154	2,078
Doubtful	1,424	1,397	2,536	50	+20%	698	1,268	1,775
Loss	348	416	210	100	--	416	210	210
TOTAL	181,112	233,687	260,830	Excess (deficit) of regulatory provisions		4,475	5,302	6,735
Provisions for loan losses	4,409	4,932	5,310			457	8	(1,425)

26 A benchmark analyses on ratios relating to loan loss reserves and classified loans to total loans and equity is provided below (Table A9.12).

TABLE A9. 12.

	EAP Regional Average	Peer Chinese Banks As Of. 2004	Developed Countries Average
Loan Loss Reserves to Total Loans	4.4%	2.7%	2.5%
HXB		2.4%	2.4%
Loan Loss Reserves to Classified Loans	92.3%	92.7%	129.5%
HXB		61.5%	
Classified Loans to Total Loans	6.8%	5.7%	2.9%
HXB		4.0%	
Classified Loans to Equity	49.8%	36.9%	27.9%
HXB		77.8%	

27 Per Table A9.13, Huaxia's NPL stood at 2.8% as of June 30, 2006, thereby meeting the CBRC requirement. Moreover, HXB's NPLs is considered lower than that of major Chinese commercial Banks.

TABLE A9. 13. SHARE IN TOTAL LOANS (%)

Share in Total Loans (%) as of June 30, 2006		
	HUA XIA BANK	Benchmark: Banks By Type
NPLs by Five-category Classification	2.80%	7.53%
Substandard	1.80%	1.80%
Doubtful	0.90%	2.96%
Loss	0.10%	2.77%
By Institutions	HUA XIA BANK	Major commercial banks
	2.80%	7.80%
	HUA XIA BANK	SOCBs
	2.80%	9.47%
	HUA XIA BANK	JSCBs
	2.80%	3.09%
	HUA XIA BANK	City commercial banks
	2.80%	6.72%

HUA XIA BANK Rural commercial banks

2.80%

6.64%

HUA XIA BANK

Foreign banks

2.80%

0.87%

31. With respect to HXB's credit culture, per review of its lending policies, practices and procedures (Attachment 6), HXB appears to have appropriate capacity dealing with credit classification, monitoring and recovery.

Management and Corporate Governance

32. HXB's governance structure appears well-balanced with a two tier structure composed of a Board of Directors and a Supervisory Board both reporting to the Shareholders' Meeting, in accordance with the Code of Corporate Governance for Listed Companies issued by China Securities Regulatory Commission. Duties and responsibilities of each board are carried out through a number of committees which oversee HXB's operations. A comparison of HXB's corporate governance procedures with BIS standards has been developed as part of the due diligence review.

33. HXB's Board of Directors is made up of 17 directors, among which 7 are independent directors and 4 are senior managers of HXB. In terms of decision, authorization and voting procedures, the Board of Directors strictly follows the law, regulations and Articles of Association. In 2005, HXB held 5 meetings of Board of Directors altogether in accordance with relevant regulations of Articles of Association and Board of Directors Procedure Rules. Four special committees do assist the Board of Directors in discharging its duties, such as Related Transactions, Risk Management, Remuneration and Remuneration and Performance Committees. During the year 2005, the four special Committees held 8 meetings.

34. According to the resolution passed at the meeting of the Board of Directors of HXB on October 29, 2006, Mr. Colin Grassie, CEO of Asia Pacific, Deutsche Bank, has been appointed member of the Board of Directors as well as member of the Strategic Committee and Risk Management Committee, representing DBG's combined shareholding of 13.98%. Besides its investment into HXB's share capital, DBG is also offering HXB with a two years technical assistance (TA) package worth an estimated value of 20,000 man/days. The TA would assist HXB in i) credit and risk management techniques; ii) Information Technology enhancement; iii) overall bank management and strategy; iv) product development; and v) internationalization. It's expected that the involvement of DBG would contribute positively to HXB's corporate governance in the years to come.

35. The Supervisory Board is made up of 10 supervisors, among which 2 are external supervisors and 4 are employee's representative supervisors. In 2005, the Board of Supervisors held 4 meetings in accordance with relevant regulations of Articles of Association and Board of Supervisors Procedure Rules. The Supervisory Board is

supported by two committees: Auditing and Nomination Committee. The Auditing Committee convened five meetings in 2005 for purpose of i) organizing the site examination on the board of supervisors; ii) hearing the examination report issued by the audit department; and iii) submitting its opinions on correction and improvement to the operation management after such opinions are passed by the board of supervisors. The Nomination Committee convened three meetings and reviewed the compliance of directors, supervisors and senior management and their performance on their related duties.

36. HXB financial statements are prepared according to IFRS and audited by two auditing firms: Beijing Ju Du Certified Public Accountants Co. Ltd. who audited HXB's financial statements in accordance with Chinese Accounting Standards (CAS) and Ernst & Young, Hong Kong Ltd., who audited the financial statements prepared in accordance with International Financial Reporting Standards (IFRS) and International Accounting Standards (IAS). The Board of Directors selects the Audit Firm and proposes it to the Shareholders Meeting for approval. External Auditors issue their reports to the Shareholders Meeting. Both external auditors have been engaged by HXB during the last five consecutive years.

37. HXB's financial statements for the years ended 2003 to 2005, received a clean, unqualified opinion from the appointed external auditors above mentioned, both as per IFRS-IAS and CAS. The external auditors report to management on the adequacy of HXB's system of internal controls. Management letters are issued by the external auditors as part of their annual audit work.

38. HXB releases quarterly disclosures commenting on its business development whose contents and sections follow the structure of its annual report. Periodic disclosures are reviewed and approved by HXB's Chairman, HXB's President, the Financial Controller and the Head of Treasury and Finance Department.

39. With respect to HXB's exposure to shareholders, or related parties, as of December 31, 2005 loans granted to shareholders holding over 5% of the total HXB shares or its associated enterprises or other enterprises with the same key executives, represented 0.67% of total loan portfolio. Large related party loans are subject to approval by the Board of Directors only. Since HXB has no controlling shareholder, transactions with related parties are in accordance with CBRC regulations.

Earnings

40. HXB's operating income earned during the last three years till June 2006 (Attachment 3) is mainly generated by the interest-based loan business. At the end of 2005, net interest income represented 96.2% of total operating income. During the first half of 2006 HXB maintains the ratio of other operating income to gross operating income, with a slight upward trend of 5.3%. Income received from Fee and Commission business (fees and commissions plus foreign exchange profits), represents a mere 3.8% of Total Operating Income (TOI), but showing a positive improvement during the first half of 2006 with growth of 39% to 5.3% of TOI.

41. HXB Interest margin compares almost equal to that of peer Chinese banks (Table A9.14). Interest rate on credits (6.5%) and costs on borrowed funds (1.9%) rank third among the five peer banks.

TABLE A9. 14. INTEREST MARGIN ANALYSIS

Interest Margin Analysis		
	2004	2005
Interest Rate on Credits		
Hua Xia Bank	6,4%	6,5%
China Development Bank	5,6%	5,9%
Industrial & Commercial Bank	5,0%	6,0%
Citic Bank	15,0%	16,9%
Minsheng Bank	5,9%	7,0%
Total Cost on Borrowed Funds		
Hua Xia Bank	1,7%	1,9%
China Development Bank	3,1%	3,3%
Industrial & Commercial Bank	1,4%	1,5%
Citic Bank	7,0%	7,2%
Minsheng Bank	2,0%	1,1%
Interest Margin to Average Assets		
Hua Xia Bank	2,3%	2,3%
China Development Bank	2,2%	2,3%
Industrial & Commercial Bank	2,3%	2,4%
Citic Bank	2,1%	2,3%
Minsheng Bank	3,4%	2,4%

42. HXB is running its business profitably generating positive ROEs of 11.6% (2004), 14.0% (2005) and 13.8% (first half of year 2006). Net profits after tax amounted to RMB 1,030 billion (2004) and RMB 1,401 billion (2005).

TABLE A9. 15. RETURN ON EQUITY AND DIVIDENDS PAID

Return on Equity and Dividends paid	2004	2005	June 30, 2006
Return on Equity (ROE)	11.6%	14.0%	13.8%
Net Profit After Tax (RMB '000,000)	1,030	1,401	745
Total dividend paid for that year	420	462	N/A
Dividend as % of Net Profit After Tax	40.8%	33%	N/A
ROE EAP Regional Average	18.7%		
ROE Peer Chinese Banks Average	15.0%		
ROE Developed Countries Average	12.9%		

43. However, HXB's ROE of 14.0% ranked lowest among peer Chinese banks and is also below the regional average per Table 9. This may be attributable to a combination of the following factors: i) small contribution of non-interest, fee based income (2.5%) to total operating income; ii) low level of equity with respect to total assets; iii) relative high operating expenses to operating income.

44. HXD kept its ROA stable at 0.4% for 2004 and 2005, ranked also the lowest among the peer Chinese banks, about 0.20% behind the average of 0.6%.

TABLE A9. 16. PROFITABILITY

Profitability		
	2004	2005
Net Return on Equity (ROE)		
Hua Xia Bank	11,6%	14,0%
China Development Bank	17,7%	19,1%
Industrial & Commercial Bank	20,5%	32,1%
Citic Bank	10,0%	12,1%
Minsheng Bank	16,8%	21,5%
EAP Regional Average	18.7%	
Peer Chinese Banks	15.0%	
Developed countries benchmark	12.9%	
Net Return on Assets (ROA)		
Hua Xia Bank	0,4%	0,4%
China Development Bank	1,2%	1,3%
Industrial & Commercial Bank	0,7%	0,8%
Citic Bank	0,5%	0,6%
Minsheng Bank	0,8%	0,5%
EAP Regional Average	1.6%	
Peer Chinese banks Average	0.6%	
Developed countries Average	0.8%	

45. Operating Expenses as shown in Table A9.17 remain stable compared with total operating income. Efficiency (per Table A9.18) is considered adequate and compared favorably with the international benchmark of 64.5% achieved by banks operating in the East Asia region, but below the peer Chinese banks (2004: 40.3%).

TABLE A9. 17. OPERATING EXPENSES

Operating Expenses	2004		2005		June 30, 2006	
	AUDITED	%	AUDITED	%	Unaudited	%
20. Salaries and other personnel expenses	-814.592	12,6%	-1.188.092	14,8%	-785.135	-17,4%

21. Operational expenses	-1.728.592	-	26,7%	-2.052.979	-	25,6%	-953.250	-21,1%
22. Other current expenses	-474.568	-	7,3%	-604.878	-	7,6%	-348.908	-7,7%
23. Depreciation	-340.406	-	5,3%	-381.579	-	4,8%	-197.653	-4,4%
24. Total Operating expenses	-3.358.158	-	51,9%	-4.227.528	-	52,8%	-2.284.946	50,6%

TABLE A9. 18. EFFICIENCY

Efficiency		
	2004	2005
Operating Expenses to Operating Income		
Hua Xia Bank	51,9%	52,8%
China Development Bank	15,4%	18,3%
Industrial & Commercial Bank	36,9%	40,1%
Citic Bank	55,8%	58,1%
Minsheng Bank	54,0%	55,7%
Regional benchmark (South East Asia)	64.5%	
Peer Chinese banks benchmark	40.3%	
Developed countries benchmark	65.4%	

Liquidity

46. The main source of financing HXB's assets comes from deposits taken from customers. As of June 30, 2006, customer deposits comprised 86.2% of total liabilities (Attachment 4). Customer deposits grew 28.3% in 2004 moderating its pace to 15.7% in 2005, which was positioned the second lowest among the peer Chinese banks (Table A9.19). The funding structure of HXB is similar to that of peers with 90.8% of customer deposits financing the loan portfolio (Table A9.20). As of June 30, 2006, demand and savings deposits represented 37.6% of total deposits, comprising 41.3% time deposits and 18.2% as deposits pledged as collaterals to loans extended to customers.

TABLE A9. 19. DEPOSITS GROWTH

Deposits growth	2004	2005	June 30, 2006
Hua Xia Bank	28,3%	15,7%	16.4%
China Development Bank	45,9%	42,7%	N/A
Industrial & Commercial Bank	9,8%	10,8%	N/A
Citic Bank	N/A	18,0%	N/A
Minsheng Bank	N/A	28,6%	N/A

TABLE A9. 20. FUNDING STRUCTURE

Funding Structure		
	2004	2005
Customer Deposits / Total Borrowings		
Hua Xia Bank	90,7%	90,8%
China Development Bank	6,1%	7,2%
Industrial & Commercial Bank	91,4%	91,5%
Citic Bank	80,2%	80,9%
Minsheng Bank	88,0%	89,3%

47. HXB issued in 2004 subordinated debt totaling RMB 4.250 billion with a maturity period of six years and PBC's benchmark one year fixed interest rate plus 2.72% to 2.82%. The estimated cost of this debt for 2005 is 5.1%. This quasi equity instrument is used by HXB as supplementary capital to comply with CAR.

TABLE A9. 21. LOANS TO DEPOSITS

Loans to Deposits			
	2004	2005	June 30, 2006
HuaXia Bank	65,5%	73,3%	75,7%
China Development Bank	1446,7%	1230,4%	N/A
Industrial & Commercial Bank	60,9%	56,6%	N/A
Citic Bank	64,2%	65,0%	N/A
Minsheng Bank	67,0%	63,4%	N/A
EAP Average	66,3%		
Peer Chinese banks benchmark	61,6%		
Developed countries benchmark	71,4%		

48. HXB's loans to customer deposits ratio is the highest among peers with the exception of China Development Bank. This relative high ratio of 73.3% in 2005 may be understood as a direct consequence of HXB's relative low capitalization (4.7% equity to loans, Table A9.7) whose level also may restrain the bank's ability to raise finance from other banks and/or bonds and subordinated debts. HXB loans to deposits ratio was above the average of peer Chinese banks for 2004 by 3.9% percentage points but slightly below the EAP benchmark of 66,3% and fell behind of developed countries banks benchmark of 71,4%.

49. Liquidity and the relationship between key balance sheet positions are shown in Table A9.22 below:

TABLE A9.22. LIQUIDITY

Liquidity & Asset and Liabilities Management	Dec 2003	Dec 2004	Dec 2005	June 2006	CBRC Benchmark Effective 2006 Unaudited	International Benchmark (East Asia Region) 2004
Liquid Assets	91,329	121,126	121,281	128,537		
<i>% as of Total Assets</i>	37,6%	39,8%	34,0%	32,8%		
<i>% as of Total Liabilities</i>	49,3%	39,0%	41,1%	35,1%	>25%	
Net short liquidity position maturing up to 90 days	N/A	-36.7%	-44.5%	N/A	< -10%	
Customer Deposits	210,221	269,668	312,129	337,657		
<i>% as of Total Liabilities</i>	89,7%	91,4%	90,3%	88,6%	>60%	
Loans and advances (Gross)	149,690	181,112	233,688	260,830		
<i>% Loans to Customer Deposits</i>	69,5%	65,5%	73,3%	75,7%		66.3%
Net Placements with banks	N/A	719,128	92,946	N/A		
<i>% as of deposits received from banks</i>		4.1%	0.4%	N/A		

50. HXB keeps over one third of its total assets into liquid instruments (cash, bank deposits and placements and securities held for trade) which is in compliance with the 25% CBRC's minimum requirement effective 2006. Within the liquidity structure, HXB is running an important short gap - its liabilities maturing in excess of the corresponding assets - represented a risk of 44.5% on its liabilities maturing up to 90 days at the end of 2005. Customer deposits represented 90.3% of total liabilities at 2005 and 88.6% as of June 30, 2006 and were in compliance with the minimum CBRC ratio set at 60% effective 2006. HXB was not very active in the inter-bank market as its net placements took a modest 0.4% (2005) of its total deposits taken from banks.

51. An analysis of HXB's maturities mismatches is as follows:

TABLE A9.23. ANALYSIS OF HXB'S MATURITIES MISMATCHES

	Overdue +On demand	Due within 3 months	Due between 3 months and 1 year	Due between 1 and 5 years	Due over 5 years	Total
December 31, 2004						
in RMB 1 million						
Total Assets	67,132	50,564	115,664	48,800	21,962	304,122
Total Liabilities	-123,367	-62,653	-58,751	-43,877	-6,253	-294,901

Net Liquidity Gap	-56,235	-12,089	+56,913	+4,923	+15,709	+9,221
<i>Gap as % of Total Liabilities</i>	-45.6%	-19.3%	+96.9%	+11.2%	+251.2%	+3.1%
December 31, 2005						
	in RMB 1 million					
Total Assets	48,594	71,136	133,472	60,883	42,403	356,488
Total Liabilities	-128,176	-87,658	-84,132	-45,658	-51	-345,675
Net Liquidity Gap	-79,582	-16,522	+49,340	+15,225	+42,352	+10,813
<i>Gap as % of Total Liabilities</i>	-62.1%	-18.8%	+58.6%	+33.3%	*****	+3.1%
Change 2005 / 2004	-23,347	-4,433	-7,573	+10,302	+26,643	+1,592
June 30, 2006						
	in RMB 1 million					
Total Assets	51,507	81,616	150,009	64,959	43,593	391,684
Total Liabilities	-153,288	-92,263	-97,645	-37,693	-53	-380,942
Net Liquidity Gap	-101,781	-10,647	+52,364	+27,266	+43,540	+10,742
<i>Gap as % of Total Liabilities</i>	-66.4%	-11.5%	+53.6%	+72.3%	*****	+2.8%
Change 2006 / 2005	-22,199	+5,875	+3,024	+12,041	+1,188	-71

52. Maturity mismatches show a relative imbalance over the short term (maturities up to 12 months) which mainly derives from higher growth experienced by HXB on the attraction of demand and savings deposits as compared with growth on time deposits and their placement over longer maturing assets and whose impact is producing the long liquidity mismatch position on assets maturing over one year.

53. A detailed breakdown of assets and liabilities maturities as at June 30, 2006 is shown in Table A9.24.

TABLE A9.24. ASSETS AND LIABILITIES MATURITIES

Assets	June 30, 2006 – RMB 1 Million						Total
	Overdue	Demand	< 3 months	3 m – 1yr	1 yr < 5yr	=> 5 yr	
Cash on hand and due from the Central Bank	--	1,075					1,075
Due from banks and placements with - banks and other financial institutions		45,681					45,681
Reverse repurchase agreements							
Loans and advances to customers	4,751	--	62,859	140,345	29,889	17,677	255,521
Investments			6,980	7,794	33,896	22,271	70,941

Fixed assets			4,439	43q			4,482
Other assets			7,338	1,827	1,174	3,645	13,984
Total assets	4,751	46,756	81,616	150,009	64,959	43,593	391,684
Liabilities:							
Borrowings from banks and placement with banks	--	13,743	4,743	8,244			26,730
Repurchase agreements		5,659	1,147	5,324	175		12,305
Customers deposits	--	133,886	86,373	84,077	33,268	53	337,657
Subordinated debts						4,250	4,250
Other liabilities							
Total liabilities		153,288	92,263	97,645	33,443	4,303	380,942
Net liquidity gap	+4,751	-106,532	-10,647	+52,364	+31,516	+39,290	+10,742

Conclusions and Recommendations

54. **Conclusion.** The due diligence review concluded that HXB meets the eligibility criteria as set out on attachment 1:

- HXB is in substantial compliance with the prudential and regulatory requirements of CBRC;
- Have maintained an IAS calculated risk weighted capital adequacy ratio of 8.20%;
- NPL to total outstanding loans stood at 2.8%;
- Profitable for the years under review as reflected in the IAS audited financial statements;
- Appropriate management and governance structure

55. Recommendations:

- HXB shareholders should consider realign bank's equity to levels commensurate with the size of total assets and underlying risks within its loan portfolio. As of end of June 2006, the equity shortage to total assets compared to average peer Chinese banks, was estimated at RMB 4.5 billion, and RMB 8.7 billion if compared against net loans. The equity realignment might be a compounded mixture of: i) new share capital issues; ii) moderating growth on the loan portfolio; iii) moderating growth on total assets; and iv) increasing profitability and capitalizing profits.
- Provisions for potential loan losses appear low despite that they are in compliance with the "Guidelines of Risk-Based Loan Classification" (2001-12-24) and "Guidance on Provisioning for Loan Losses" (2002-4-25) issued by the People's Bank of China. In principle, prudent banking management would prompt these provisions to cover at least 100% of NPLs plus a proxy of 1% to 2% (CBRC requires 1% on Pass loans and 2% on Special Mention) as coverage for general risks underlying on performing loans outstanding. HXB should assess the feasibility of increasing provisions for loan losses to fully cover NPLs and pay attention to capital adequacy implications on its viability. A thorough assessment of each loan and its pledged collateral may result in a more precise value for provisioning.

- As a way of improving both ROE and ROA, HXB should implement strategies aimed at increasing the share of the fee based business (fees and commissions related to banking services and products) by streamlining available banking infrastructure and installed business capacity. As an example, based on year 2005 figures, should HXB's fee and commission income were 15% of TOI (other parameters remaining the same as at the end of 2005), the incremental effect of fee and commissions would +6.7%, ROE and ROA would reach 20.9% and 0.6%, respectively.
- Review its existing cost management policy with a view to make substantial savings on its incurred associated costs so as to bring efficiency to the 45% benchmark required by CBRC from year 2006.
- As a key component of its business strategy for the next two years, and with a view to increase ROE and ROA returns, HXB should consider to formulate and implement an action plan aimed at streamlining its profitability by focusing on fee and commission income generating services to contribute around 15% of total operating income (5.3% as of June 2006) and optimizing its asset portfolio risk reward profiles.
- HXB should consider reviewing the profitability of its asset base, taking into account the risk/reward profile it wants to manage, in order to further increase ROA. This recommendation should be understood in connection with c. d. and e. above as they are deeply interrelated.
- HXB should consider to extent the term of its liabilities structure so that short liquidity position gaps observed for periods up to 90 days are reduced to levels not exceeding 10% of assets maturing within the same period, and liquidity positions on 1 year and over, not exceeding 30%. Because of its equity shortage and other third party funding (namely long-term banking credits and bonds), HXB relies heavily on its customer deposits to fund the loan portfolio. The lack of long-term funding is causing treasury to run important maturities mismatches which become critical over the short term (up to 90 days).

E. SUB-PROJECT ECONOMIC AND FINANCIAL ANALYSIS

56. The selection of sub-projects for energy efficiency financing will be the responsibility of on-lending banks and such financing will focus on renovation and rehabilitation activities whose primary financial benefits will be derived from improvements in energy efficiency.

57. It is widely recognized that most energy efficiency investments are economically justified if they are financially viable. In China, where coal is the dominant fuel, the economic justification is even stronger because of the significant environmental benefits expected from energy efficiency investments, resulting in economic internal rates of return (EIRRs) that are higher than the financial internal rates of return (FIRRs). This project is built on the premise that the proposed energy efficiency subprojects are economically justified if they are financially viable, and hence onlending banks will not be required to ensure that the EIRR of selected subprojects exceed any pre-established

economic discount rate. However, only subprojects that yield expected FIRR that exceed the weighted average cost of capital of the subproject sponsor will be eligible for bank financing.

58. To confirm the validity of the above premise, a study was conducted during project preparation to survey major energy saving technologies requiring investments between \$5 and 25 million to reduce energy consumption and improve energy efficiency in three energy intensive industries in China, specifically, iron and steel, chemical and petrochemical and cement¹⁵. The study reviewed 17 technologies for the iron and steel industry, 30 technologies for the chemical and petrochemical industry, and 9 technologies for the cement industry. The study also assessed the payback period for most of the technologies based on actual projects carried out in China during the 1990s and early 2000s, and in Japan. The payback periods, calculated on very conservative assumptions, are as follows:

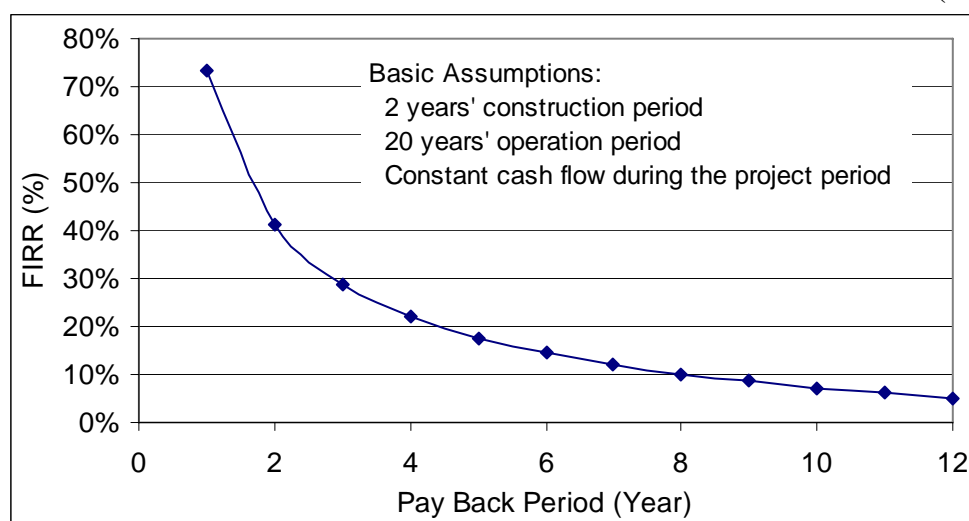
TABLE A9.25. PAY BACK PERIODS (PBP) OF THE SURVEYED TECHNOLOGIES

PBPs Technologies	PBP ≤ 5 yrs	5 yrs ≤ PBP ≤ 8 yrs	8 yrs ≤ PBP	Total
Iron and Steel	8	4	5	17
Chemical and Petrochemical	26	0	4	30
Cement	2	2	5	9
Total	36	6	14	56

59. Of the 56 energy saving technologies surveyed by the abovementioned study, 42 of them (that is, 75 percent of the total) had cash flows that investment payback periods (PBP) of less than 8 years. An analysis of the relationship between the simple payback period and the financial internal rate of return (FIRR) was conducted to estimate the FIRR associated with each of the payback periods. The relationship between PBP and FIRR based on the assumptions of a typical energy efficiency sub-project is presented below in Figure []. A PBP of 8 years translates to an FIRR of 10.2 percent, higher than the weighted average cost of capital of 8 percent that is assumed for a typical medium to large scale enterprise in China, implying that 75 percent of the energy saving technologies which were covered by the survey had financial returns which would exceed their weighted average cost of capital. The median PBP for the 56 technologies was 3.3 years, which is equivalent to a FIRR of 26.5 percent, far in excess of the threshold discount rate.

¹⁵ "China Energy Efficiency Financing Project: Report for World Bank", Tokyo Energy Efficiency Group, December 31, 2006. The report is included in the project files.

FIGURE A9.1: RELATIONSHIP BETWEEN FIRR AND PAYBACK PERIOD (PBP)



60. In addition, economic and financial analyses were performed on a representative sample of four of the first batch of sub-projects envisaged for financing under the proposed project to further evaluate and demonstrate the economic and financial viability of energy efficiency investments. The four sub-projects which have been identified by the on-lending banks are located in Anhui province, and include: (i) a waste heat recovery in a cooper making process, (ii) a waste heat recovery in a vitriol production process, (iii) a rehabilitation of fans and pumps, and (iv) a rehabilitation of Polyvinyl Alcohol (PVA) production line. Cost-benefit analyses were carried out to estimate the internal economic rates of return (EIRRs), the financial internal rates of return (FIRRs) and the payback period (PBP) of these sub-projects.

61. The estimation of the incremental financial and economic benefits of the sub-projects has been estimated based on conservative assumptions about the expected energy savings and environmental benefits. Costs considered in the calculation include investment costs and incremental operation costs. Benefits considered for the analyses include energy savings, valued at market energy price, and for EIRR, the environmental benefits, valued at 4,978 \$/ton for particulate, 218 \$ /ton for SO₂, and 10 \$/ton for CO₂ emission.

62. Since it is likely that these sub-projects could qualify for carbon financing, the financial benefits have been considered with and without carbon financing revenues. Energy saving financial benefits for the sample sub-projects are derived from two sources: a reduction in the amount of energy consumed (such as a reduction in the intake of oil, coal, electricity), and in selected cases, from own generation of electricity using recovered waste heat which helps the enterprise to reduce its purchase of electricity. The sub-project environmental benefits are derived from the avoidance of emission resulting from the improvement in energy efficiency. The avoided emission of SO₂ and TSP from the burning of heavy oil and coal (either for steam production or electricity generation) are assumed to provide local environmental benefits whereas the associated avoidance in CO₂ emission is expected to result in global environmental benefits.

63. The key common assumptions in estimating the economic and financial benefits of the four sub-projects are summarized below:

Financial:

- Value added tax (VAT): 17% for electricity and heavy oil, 13% for coal.
- Energy prices are based on market prices of 2,800 yuan/ton of heavy oil, industrial electricity tariff of 0.56 yuan/kWh, electricity feed-in tariff of 0.378 yuan/kWh (VAT included for above prices) and 500 yuan/tce of coal (VAT excluded), and
- Electricity losses from generation plant use and transmission & distribution (T&D) losses assumed at 15%

Environmental:

The emission factors and the value per ton of avoided emission which have been assumed for the economic analyses are as follows:

TABLE A9. 26. EMISSION FACTOR

Emission	Electricity Production (kg/GWh)	Heavy Oil Combustion (kg/ton)	Value for Emission Avoided (US\$/ton)
TSP	342	0	4,978
SO ₂	3,804	12	218
CO ₂	794,989	3,116	10

64. The externality cost of particulate and SO₂ were calculated based on the “China Environmental Burdens from Air and Water Pollution” report, which was jointly completed by the Chinese governments (State Environmental Protection Administration, Ministry of Water Resources, Ministry of Health and its Center for Disease Control), the World Bank, Resources for the Future (USA), and CICERO and ECON (both Norway) in January 2007. The carbon emission was valued at the recent carbon trade market price

65. The following tables summarize the results from the economic and financial analysis of the four sample sub-projects. The analyses showed that the EIRR for the representative sub-projects ranged from 13.2 percent to a high of 64.2 percent. These EIRRs exceed the social discount rate of 12 percent usually considered in Bank financed energy projects and previous Chinese guidelines for evaluation of projects, confirming, as expected, the economic viability of the subprojects. A lower social discount rate of 8 percent was retained in the recently revised guidelines for evaluation of projects in China. The lower discount rate of 8% increases the robustness of the conclusion that energy efficiency investments are economically sound and desirable.

**TABLE A9.27. RESULTS OF THE ECONOMIC ANALYSES
OF REPRESENTATIVE SUB-PROJECTS**

Sub-Project	EIRRs (%)	Energy Savings (tce)				CO ₂ Reductions (tons)
		Oil	Electricity	Coal	Total	
Waste Heat Utilization in Cooper Making	13.2	9,000	2,767	4,800	16,567	38,430
Waste Heat Utilization in Vitriol Production	58.2			55,360	55,360	137,533
Rehabilitation of Fans and Pumps	36.1			13,124	13,124	32,603
Rehabilitation of PVA production line	64.2		1,645	40,335	41,980	104,293
Total	34.4	9,000	4,412	113,619	127,031	312,860

66. On a combined basis, the representative four sub-projects yield an EIRR of 34.4 percent. The annual energy saving of these four sub-projects amounts to 127,031 tons of coal equivalent and the annual carbon reduction amounts to 312,860 tons. Based on the total investment cost of the four sub-projects, the average carbon reduction cost was estimated as 25.8 \$/ton of carbon reduction or 7.0 \$/ton of CO₂ reduction.

67. Extrapolation based on the analysis of the four sub-projects imply that the project will result in annual energy savings of 1.6 million tce and annual CO₂ emission reduction of 3.9 million tons, considering the \$200 million investment together with co-financing from participating banks and equity provided by enterprises themselves. The total investment on EE subprojects was estimated at \$571 million, including 70 percent debt (\$200 million from IBRD and \$200 million from participating banks) and 30 percent equity financing in the first five years of project implementation.

68. Similarly, the sub-projects yield attractive financial returns and hence their implementation should be of material interest to both the on-lending banks and the sub-project sponsors. The FIRRs for the four sub-projects range from 11.2 to 60.2 percent (before income tax), which indicates that the sub-projects are financially attractive against the typical weighted average cost of capital of 8 percent of medium and large-scale enterprises in China. Similarly, the payback period are relatively short, ranging from 1.2 to 6.6 years and the average payback duration is 2.3 years with carbon financing and 2.7 years without carbon financing. The table below summarizes the FIRR and PBP results for the four sub-projects.

**TABLE A9.28. RESULTS OF THE FINANCIAL ANALYSES
OF REPRESENTATIVE SUB-PROJECTS**

Sub-Project	Investment Cost (million US\$)	FIRR (%)		PBP (years)	
		With CF	W/O CF	With CF	W/O CF
Waste Heat Utilization in Cooper Making	21.09	12.5	11.2	5.9	6.6
Waste Heat Utilization in Vitriol Production	9.44	55.9	47.5	1.2	1.5
Rehabilitation of Fans and Pumps	4.91	35.0	31.8	1.9	2.2
Rehabilitation of PVA production line	8.65	60.2	48.2	1.7	2.1
Total	44.09	32.8	28.3	2.3	2.7

Subproject 1: Waste Heat Utilization in Cooper Making Process

Description

69. Tongling Nonferrous Metal Corporation plans to recover the waste heat in its copper making process to reduce energy consumption and thereby decrease its energy expenditures. The proposal includes: (a) substitution of recovered waste heat heavy oil in the cooper minerals drying process, (ii) rehabilitation of the existing waste heat utilization boilers to recover more heat from its vitriol making process, and (iii) use of the recovered waste heat for power generation (2.5 MW generation unit).

Economic Analysis

70. *Economic Costs.* Economic costs considered in the analysis include (i) the total investment cost of 164.5 million yuan, and (ii) the annual incremental operation costs. All costs are net of taxes and duties, assumed at 1 percent annually of the investment cost. The conversion factor considered in the analysis is 1.0 since financial costs are determined by the market.

71. *Economic Benefits.* The major economic benefits considered in the analysis include (i) energy savings from waste heat utilization which include reduction of heavy oil consumption by 6,300 ton/year, reduction of electricity consumption by 7.35 GWh/year, substitution of 15.0 GWh/year generated by heat recovery to electricity purchases from the grid, and (ii) associated environmental benefits due to avoided pollutant emissions from heavy oil combustion and electricity production. The market price of heavy oil and sales price of electricity (tax excluded) are taken as the proxy of consumer willingness to pay. The value of avoided pollutants are estimated based on the report “China Environmental Burdens from Air and Water Pollution”, which was jointly completed by the Chinese governments, the World Bank and other international agencies in January 2007. The carbon emission was valued at the recent carbon trade market price.

72. *Economic internal rate of return.* The detail analysis of the EIRR estimate for this subproject is shown in Table A9.29 below. The EIRR of the sub-project is 13.2 percent,

higher than the 12 percent hurdle (discount) rate applied by the Bank to provide economic justification. The estimated annual energy saving for this sub-project is 16,567 tons of coal equivalent (tce) and the annual CO₂ emission reduction is 38,430 tons.

TABLE A9. 29: COST BENEFIT ANALYSIS FOR WASTE HEAT UTILIZATION IN COOPER MAKING PROCESS SUB-PROJECT

Year	Cost			Benefit						Net Benefit	
	Investment	O&M Cost	Subtotal	Energy Saving			Enviornmental		Subtotal		
				Heavy Oil	Electricity	Generation	Local	Carbon			
-2	32.91	0.00	32.91	0.00	0.00	0.00	0.00	0.00	0.00	-32.91	
-1	98.72	0.00	98.72	0.00	0.00	0.00	0.00	0.00	0.00	-98.72	
0	32.91	0.00	32.91	0.00	0.00	0.00	0.00	0.00	0.00	-32.91	
1	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
2	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
3	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
4	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
5	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
6	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
7	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
8	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
9	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
10	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
11	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
12	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
13	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
14	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
15	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
16	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
17	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
18	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
19	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
20	0.00	1.65	1.65	15.08	3.52	6.46	0.60	3.00	28.65	27.00	
NPV @ 12%				140.2	80.2	18.7	34.4	3.2	15.9	152.3	12.1
EIRR											13.2%

73. *Sensitivity and Risk Analysis.* The sensitivity and risk analysis for this sub-project were conducted considering its relatively low EIRR. The selected variables include energy price, investment cost, and the price of carbon. The sensitivity analysis showed that the EIRR will decrease to (i) 11.9 percent if energy price decreases by 10 percent, (ii) 11.9 percent if investment cost increases by 10 percent, and (iii) 12.9 percent if carbon price decreases by 20 percent. The risk analysis showed that the expected EIRR of this subproject will be 13.2 percent based on Monte-Carlo simulation of 1,000 times, same as the base case considering the growing energy price which benefits EE subprojects and compensates part of other adverse impacts to this sub-project. The probability of an EIRR lower than 12 percent is about 22 percent.

Financial Analysis

74. The FIRR of the proposed investment is 11.2 percent. This rate would improve to 12.5 percent assuming that the reduction in CO₂ could benefit from receipt of carbon financing revenues, which have been assumed to trade at \$10/ton. Both FIRRs are higher than the estimated investor's hurdle rate of 8.0 percent. The pay back period of this sub-project was calculated as 6.6 years without carbon financing revenues. The PBP decreases to 5.9 years if carbon financing revenues are included.

Subproject 2: Waste Heat Utilization in Vitriol Production Process

Description

75. The owner of this sub-project is also the Tongling Nonferrous Metal Corporation who plans to recover and use the waste heat produced during the vitriol production process. Two generation units (2x18MW) will be installed to utilize the recovered waste heat for electricity production.

Economic Analysis

76. The economic costs and benefits are assessed according to the methodology described above. The *economic costs* include (i) total investment cost of 73.6 million yuan, and (ii) annual incremental operation cost. The major *economic benefits* considered for the analysis include (i) annual generation of 173 GWh from recovered waste heat, and (ii) associated environmental benefits due to reduction in pollutants emission from the avoidance of electricity purchase.

77. The detailed estimate of EIRR for this subproject is presented in table A9.30. The EIRR of the sub-project is 58.5 percent, much higher than the 12 percent threshold, indicating the robustness of the economic viability of sub-projects of similar nature. The estimated annual energy saving for this sub-project is 55,360 tons of coal equivalent (tce) and the annual CO₂ emissions reduction is 137,533 tons.

**TABLE A9.30. COST BENEFIT ANALYSIS FOR WASTE UTILIZATION IN VITRIOL
PRODUCTION PROCESS SUB-PROJECT**

Year	Cost							Net Benefit
	Investment	O&M Cost	Subtotal	Electricity Consumption Saving	Enviornmental		Subtotal	
					Local	Carbon		
-1	51.55	0.00	51.55	0.00	0.00	0.00	0.00	-51.55
0	22.09	0.00	22.09	0.00	0.00	0.00	0.00	-22.09
1	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
2	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
3	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
4	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
5	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
6	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
7	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
8	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
9	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
10	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
11	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
12	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
13	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
14	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
15	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
16	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
17	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
18	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
19	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
20	0.00	3.68	3.68	50.30	3.42	10.73	64.45	60.77
NPV @ 12%			85.6	299.5	20.4	63.9	383.8	298.2
EIRR								58.5%

Financial Analysis

78. The FIRR is calculated according to the same methodology described above. The FIRR of the proposed investment is 47.5 percent and would increase to 55.9 percent if the benefits of CO₂ emission reductions trading at \$10/ton are included in the analysis. These returns clearly exceed the subproject sponsor's assumed weighted average cost of capital of 8.0 percent. The payback period of this sub-project was calculated as 1.5 years without carbon financing revenues. The PBP will decrease to 1.2 years if carbon financing revenues are included.

Subproject 3: Rehabilitation of Fans and Pumps

Description

79. The owner of this sub-project is also Tongling Nonferrous Metal Corporation which plans to rehabilitate the 74 sets of fans and pumps in its factory by adopting frequency control technology.

Economic Analysis

80. The *economic costs* considered in the analysis include (a) the total investment cost of 38.3 million yuan, and (b) the annual incremental operation cost. The major *economic benefits* considered in the analysis include (i) annual electricity consumption saving of 36.91 GWh, and (ii) associated environmental benefits due to avoided pollutant emissions from reduced electricity generation.

81. The detailed calculation of the EIRR for this subproject is shown in the table A9.31. The EIRR of the sub-project is 36.1 percent, much higher than 12 percent discount benchmark. The estimated annual energy saving for this sub-project is 13,124 tons of coal equivalent (tce) and the annual CO₂ emission reduction is 32,603 tons.

**TABLE A9.31: COST BENEFIT ANALYSIS FOR REHABILITATION OF FANS AND PUMPS
SUB-PROJECT**

Year	Cost		Subtotal	Benefit				Net Benefit
	Investment	O&M Cost		Electricity Consumption Saving	Enviornmental		Subtotal	
					Local	Carbon		
-3	3.83	0.00	3.83	0.00	0.00	0.00	0.00	-3.83
-2	11.49	0.00	11.49	0.00	0.00	0.00	0.00	-11.49
-1	11.49	0.00	11.49	0.00	0.00	0.00	0.00	-11.49
0	11.49	0.00	11.49	0.00	0.00	0.00	0.00	-11.49
1	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
2	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
3	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
4	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
5	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
6	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
7	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
8	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
9	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
10	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
11	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
12	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
13	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
14	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
15	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
16	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
17	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
18	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
19	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
20	0.00	0.00	0.00	17.67	0.81	2.54	21.02	21.02
NPV @ 12%			28.1	83.9	3.8	12.1	99.8	71.7
EIRR								36.1%

Financial Analysis

82. Based on the expected net financial benefit, the FIRR of the proposed investment is 31.8 percent and would increase to 35.0 percent when benefits from carbon financing are included. Both FIRR's are higher than the assumed weighted average cost of capital of 8.0 percent. The pay back period of this sub-project was calculated as 2.2 years without carbon financing revenues. The PBP decreases to 1.9 years if carbon financing revenues are included.

Subproject 4: Rehabilitation of Polyvinyl Alcohol (PVA) Production Line

Subproject Description

83. The owner of this sub-project is Anhui Waiwei Advanced Materials Company. It plans to improve the enterprises energy efficiency by rehabilitating its (a) PVA production line, (b) air cooling system, and (c) CHP plant to make use of waste heat for more generation and reduce its power purchase from the grid.

Economic Analysis

84. The *economic costs* include (a) the total investment cost of 67.4 million yuan, and (b) the annual incremental operation cost. The major *economic benefits* considered for the analysis include (a) the resulting energy savings including the reductions of electricity consumption by 4.37 GWh/year and the reductions of steam consumption by 52 ton/hour, (b) the associated environmental benefits due to avoided pollutant emissions from coal burning for electricity and steam production, and (c) the reduction of water consumption.

85. The detailed calculation of the EIRR for this subproject is shown in table A9.32. It shows that the EIRR of the sub-project is 64.2 percent, much higher than 12 percent hurdle rate. The estimated annual energy saving for this sub-project is 41.980 tons of coal equivalent (tce) and the annual CO2 emission reduction is 104,293 tons.

TABLE A9.32. COST BENEFIT ANALYSIS FOR REHABILITATION OF PVA PRODUCTION LINE SUB-PROJECT

Year	Cost		Subtotal	Benefit						Net Benefit
	Investment	O&M Cost		Energy Saving		Water Con. Saving	Enviornmental		Subtotal	
				Electricity	Coal		Local	Carbon		
0	67.44	0.00	67.44	0.00	0.00	0.00	0.00	0.00	0.00	-67.44
1	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
2	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
3	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
4	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
5	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
6	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
7	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
8	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
9	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
10	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
11	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
12	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
13	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
14	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
15	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
16	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
17	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
18	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
19	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
20	0.00	0.00	0.00	2.46	20.17	9.91	2.59	8.13	43.27	43.27
NPV @ 12%			60.2	16.4	134.5	66.1	17.3	54.3	288.6	228.4
EIRR										64.2%

Financial Analysis

86. The financial internal rate of return of this sub-project is 48.2 percent and would increase to 60.2 percent if benefits from emission reductions trading at \$10/ton are also included. Both FIRRs are higher than the estimated investor's hurdle rate of 8.0 percent. The payback period of this sub-project was calculated as 2.1 years without carbon financing revenues, and 1.7 years with carbon financing revenues included.

Conclusions

87. The analyses of the four sub-projects provide extended comfort that the energy efficiency investments which are likely to be considered by the on-lending banks will be economically justified and financially viable. The financial viability of these subprojects would be enhanced if CO₂ emission reductions are traded. As the environmental benefits are usually underestimated in countries like China, where coal is dominant, the economic viability is even more robust and EIRRs are consistently higher than FIRRs.

Annex 10: Safeguard Policy Issues

EAST ASIA AND PACIFIC: China Energy Efficiency Financing

1. The energy efficiency sub-projects which will be financed by the IBRD loan under this Project generally should result in minor impacts on the environment that can be mitigated by taking standard measures. As such, the overall Project belongs to the Category B according to the World Bank's operational policy on Environmental Assessment (OP4.01). However, owing to the possibility of great differences of the sub-projects in environmental issues, it is possible for some sub-projects to have significant environmental issues and if evaluated on their own merit might be required by both the Government of China and the World Bank to require a detailed Environmental Impact Assessment (equivalent to World Bank Category A). Therefore, it is not suitable to prepare uniform environmental impact assessment (EIA) documentation for all sub-projects. The purpose of this framework EIA document (Framework Document) is to be used to provide guidance to both the Sub-project sponsor (Sub-borrower) and the Participating Financial Institution (PFI) for the environmental assessment process to be followed in evaluating individual sub-projects that are to be considered for financial support under the overall Project.

2. This Framework Document defines the contents, procedures and responsibilities for environmental assessment of the sub-projects, whose purpose is to ensure the environmental assessment is in compliance with both Chinese EA laws and regulations and in accordance with World Bank EA policies and procedures as specified in OP/ BP 4.01 (Environmental Assessment).

3. The EA procedure covers the following six aspects of preparation/construction phase and two aspects of implementation phase. Each of the aspects is described below along with the requirements and responsibilities for each aspect.

A. Sub-Project Preparation and Construction Phase

1. Project Screening
2. EA Document Preparation
3. Public Consultation
4. Review and Approval of EA
5. Disclosure
6. Related Conditions and Responsibilities

B. Implementation Phase

7. Supervision
8. Reporting

A. Sub-Project Preparation and Construction Phase

General

The Sub-borrower is responsible for project screening, EA document preparation, public consultation, and disclosure. *The PFI has no involvement in these activities.* After the Sub-borrower obtains the required Chinese environmental approvals, it will be required

to submit to the PFI an information package consisting of items outlined in paragraph **ix** to demonstrate that the Chinese EA procedures have been followed in strict accordance with Chinese EA regulations. The PFI will review this material and if necessary, request additional supplementary information from the Sub-borrower to insure that the World Bank EA procedures are also followed. Details of these requirements are presented below.

1. Sub-project Screening

The Sub-borrower will discuss the proposed sub-project with appropriate local, Provincial or State Chinese environmental authorities and provide them the necessary information which they would require to establish the EIA documentation requirement. The Chinese environmental authorities will establish the EIA documentation required for the proposed sub-project either as: (a) a full EIA (equivalent to World Bank Category A), (b) an EIA Table (equivalent to World Bank Category B) or (c) no EIA required (equivalent to World Bank Category C).

2. EIA Document Preparation

The Sub-borrower is responsible for preparing the EIA documentation requirement which has been established by the appropriate Chinese environmental authorities.

Full EIA Required (World Bank equivalent of CATEGORY A)

- i. Proposed sub-projects that the Chinese environmental authorities decide require a complete EIA or involve land acquisition will not be eligible for financing under the World Bank loan.

EIA Table Required (World Bank equivalent of CATEGORY B)

- ii. Sub-projects with impacts of limited duration and/or extent and that are easily mitigated through standard, readily available, widely practiced techniques.

Nothing Required (World Bank equivalent of CATEGORY C)

- iii. Sub-projects with little or no impacts and require no mitigating measures.

Since proposed sub-projects which require a Full EIA (Category A) will not be eligible for financing under this Project and eligible sub-projects which do not require any environmental review (Category C) have no further environmental assessment requirements, the remainder of this Section, deals only with eligible sub-projects which require an EIA Table (Category B).

3. Public Consultation

- iv. The Sub-borrower is responsible for conducting the public consultation. These responsibilities include: notification to the public, conducting the consultation and recording the significant findings, conclusions, recommendations and next steps. Details of the documentation required for the public consultation are presented in Section D of Annex 10-I (Consultation with Local NGOs and Project-Affected Groups).

- v. The purpose of public consultation is to solicit views of groups or individuals who may be affected by the sub-project regarding their environmental concerns. Affected groups or people should identify the environmental issues they believe to be significant. Any significant issues, established during the public consultation, should be incorporated into the EIA Table.
- vi. Only one public consultation is required and it may be held (a) prior to preparing the draft EIA Table and incorporating the collected issues into the final draft EIA Table or (b) after a draft EIA Table is prepared which can be used as a background document to be circulated at the public consultation and then using the results of the consultation the Sub-borrower would add or delete issues from the EIA Table based upon the recommendations of the public consultation.

4. Review and Approval of EA

- vii. The Sub-borrower will submit the EIA Table to appropriate Chinese environmental authorities for review and approval.
- viii. The energy efficiency sub-projects under this Project will be restricted to renovation and rehabilitation at existing production facility (ies) of the Sub-borrower. The Sub-borrower must also validate that the existing production facility which will be defined as the “connected project” has a valid, approved EA¹⁶ if required by the Chinese environmental authorities.
- ix. The Sub-borrower will submit the following Information Package to the PFI:
 - Copy of the sub-project EIA approval letter from Chinese environmental authorities
 - EIA Table
 - Record of the Public Consultation (see Annex I, Section D: Consultation with Local NGOs and Project-Affected Groups)
 - Location (physical or website address) and Date of EIA Disclosure (see below)
 - Copy of the EIA approval letter for the “connected project”
 - Construction start date for the “connected project”

5. Disclosure

- x. The Sub-borrower will be responsible for disclosing the approved EIA Table publicly (municipal building, library etc. near the project site, and/or on an Internet website).

PFI Information Package Review

¹⁶ The World Bank environmental safeguard policies require an evaluation of any activities which although not directly involved with the World Bank investment may be “linked” to that investment and whose operational performance is dependent upon the World Bank investment. For example, if the World Bank was financing a transmission line extending from an existing power station, the policy would require a verification that the power station was operating with all appropriate environmental approvals, permits, licenses, etc. required by the sub-borrowers’ country. This is only required if the existing production facility was constructed *after* Chinese EA regulations were officially adopted *or* Chinese environmental authorities had a retroactive EA requirement for the facility.

The PFI will review the approved EIA Table and compare the information it contains with the information requirements of a World Bank Environmental Management Plan (EMP, See Annex I). If the approved EIA Table does not contain all the information required by the World Bank EMP, the PFI will request the Sub-borrower to provide the additional information to ensure that EMP information requirements of the World Bank are also satisfied.

The PFI will then review the entire information package detailed in paragraph ix to determine that: (a) the Sub-borrower has all the necessary Chinese EA approvals, (b) the information contained in the EIA Table also satisfies World Bank EMP requirements, (c) the record of the public consultation is complete, (d) the EIA was disclosed in a timely and proper manner, and (e) the “connected project” met all the Chinese EIA requirements with construction starting *after* EIA approval had been obtained.

6. Related Conditions and Responsibilities

During the investment Sub-project tender, it is the responsibility of the Sub-borrower to assure that the requirements put forward in the EIA Table have been included in all tender documents. During sub-project implementation, the PFI has the right to check tender documents to verify this condition. Satisfying these conditions is one prerequisite to winning the bid.

B. Implementation Phase

The Sub-borrower is responsible for insuring that all the requirements of the EIA Table and any supplementary World Bank EIA requirements are properly implemented.

7. Supervision

During the normal Sub-project supervision activities, the PFI will check with local environmental authorities to determine if the Sub-project implementation is meeting all specified EIA requirements. Any supervision reports prepared by the PFI should include a brief environmental section.

8. Reporting

The PFI will include an environmental section in any report prepared for the World Bank. As appropriate, the Section will discuss details of any environmental issue that occurred during the reporting period and the actions taken to resolve it.

Annex 10-I: Environmental Management Plan Format
EAST ASIA AND PACIFIC: China Energy Efficiency Financing

Sub-Project Description

1. Present a brief description of the Sub-project. Include the nature of the investment, the location, and any characteristics of the area that are of particular interest, e.g. near a protected area, area of cultural, historical, religious interest etc. Also, very briefly describe the general land use characteristics (farming, small industry etc.), and the location(s) of the nearest population centers. Provide a brief summary of the major Sub-project related environmental issues, how will they be managed, who will manage them and what, if any, are the environmental risks.

A. MITIGATION PLAN

Phase	Issue	Mitigating Measure	Cost of Mitigation (If Substantial)	Responsibility*	Start Date	End Date
Construction	• • • • •				• • • • •	• • • • •
Operation	• • • •				• • • •	• • • •

* Items indicated to be the responsibility of the contractor should be specified in the bid document

Annex 11: Project Preparation and Supervision
EAST ASIA AND PACIFIC: China Energy Efficiency Financing

	Planned	Actual
PCN review		Check web
Initial PID to PIC		March 14, 2006
Initial ISDS to PIC		Check web
Appraisal	May 2007	
Negotiations	July 2007	
Board/RVP approval	December 2007	
Planned date of effectiveness	February 2008	
Planned date of mid-term review	December 2010	
Planned closing date	December 2013	

Key institutions responsible for preparation of the project:

- Ministry of Finance, Government of China
- National Development and Reform Committee, Government of China

Bank staff and consultants who worked on the project included:

Name	Title	Unit
Leiping Wang	Senior Energy Specialist/Task Team Leader	EASTE
Nancy Chen	Senior Financial Management Specialist	EAPFP
Robert P. Taylor	Lead Energy Specialist	EASTE
Feng Liu	Consultant	EASTE
Nuru Lama	Young Professional	EASTE
Ximing Peng	Energy Specialist	EASTE
Haixia Li	Financial Management Specialist	EAPCO
Xiaowei Guo	Senior Procurement Specialist	EAPCO
Bernard Baratz	Consultant, Senior Environmental Specialist	EASTE
Mei Wang	Senior Counsel	LEGEA
Noureddine Berrah	Consultant	EASTE
Ashok Sarkar	Senior Energy Specialist	ESMAP
Nuyi Tao	Technical Specialist/Carbon Finance	ENVCF
Xiaoyu Shi	Consultant	ESMAP
Cristina Hernandez	Program Assistant	EASTE

Bank funds expended to date on project preparation:

1. Bank resources: \$400,000
2. Trust funds: \$180,000
3. Total: \$580,000

Estimated Approval and Supervision costs:

1. Remaining costs to approval:
2. Estimated annual supervision cost:

Annex 12: Documents in the Project File
EAST ASIA AND PACIFIC: China Energy Efficiency Financing

1. Technical Options of Energy Efficiency in Three Energy Intensive Sectors
2. NDRC Personnel for the Preparation of the GEF Grant
3. China Energy Conservation Financing Research Report
4. China Mid and Long Term Energy Conservation Plan

Annex 13: Statement of Loans and Credits
EAST ASIA AND PACIFIC: China Energy Efficiency Financing

Project ID	FY	Purpose	Original Amount in US\$ Millions				Cancel.	Undisb.	Difference between expected and actual disbursements	
			IBRD	IDA	SF	GEF			Orig.	Frm. Rev'd
P083322	2007	CN-SICHUAN URBAN DEV	180.00	0.00	0.00	0.00	0.00	180.00	0.00	0.00
P086515	2007	CN-3rd National Railway	200.00	0.00	0.00	0.00	0.00	200.00	0.00	0.00
P088964	2007	CN-Guangxi Integrated Forestry Dev	100.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00
P091020	2007	CN-Fujian Highway Sector Investment	320.00	0.00	0.00	0.00	0.00	320.00	0.00	0.00
P070519	2006	CN-Fuzhou Nantai Island Peri-Urban Dev	100.00	0.00	0.00	0.00	0.00	100.00	9.58	0.00
P075732	2006	CN-SHANGHAI URBAN APL2	180.00	0.00	0.00	0.00	0.00	153.11	-5.22	0.00
P081255	2006	CN-Changjiang/Pearl River Watershed Reha	100.00	0.00	0.00	0.00	0.00	99.75	5.75	0.00
P081348	2006	CN-HENAN TOWNS WATER	150.00	0.00	0.00	0.00	0.00	149.63	0.46	0.00
P082992	2006	CN-GEF-Termite Control Demonstration	0.00	0.00	0.00	14.36	0.00	14.36	0.00	0.00
P082993	2006	CN-GEF-PCB Mgmt & Disposal	0.00	0.00	0.00	18.34	0.00	18.34	4.63	0.00
P099992	2006	CN-Liaoning Medium Cities Infrastructure	218.00	0.00	0.00	0.00	0.00	218.00	5.83	0.00
P084742	2006	CN-IAIL III	200.00	0.00	0.00	0.00	0.00	160.99	16.07	0.00
P085124	2006	CN-Ecnomic Reform Implementation	20.00	0.00	0.00	0.00	0.00	18.44	-0.83	0.00
P085333	2006	CN-5th Inland Waterways	100.00	0.00	0.00	0.00	0.00	80.58	5.91	0.00
P096158	2006	CN-Renewable Energy II (CRESP II)	86.33	0.00	0.00	0.00	0.00	78.42	-7.91	0.00
P086629	2006	CN-Heilongjiang Dairy	100.00	0.00	0.00	0.00	0.00	96.75	-1.58	0.00
P094388	2006	CN-HFC-23 Emissions Reduction	0.00	0.00	0.00	0.00	0.00	1,003.66	0.00	0.00
P093906	2006	CN-3rd Jiangxi Hwy	200.00	0.00	0.00	0.00	0.00	200.00	0.00	0.00
P090336	2006	CN-GEF-NINGBO WATER & ENVMT	0.00	0.00	0.00	5.00	0.00	4.50	0.33	0.00
P069862	2005	CN - Agricultural Technology Transfer	100.00	0.00	0.00	0.00	0.00	88.46	17.16	0.00
P075730	2005	CN-HUNAN URBAN DEV	172.00	0.00	0.00	0.00	0.00	165.14	31.97	0.00
P068752	2005	CN-Inner Mongolia Highway & Trade Corrid	100.00	0.00	0.00	0.00	0.00	76.93	3.59	0.00
P067828	2005	CN-Renewable Energy Scale-up Program	87.00	0.00	0.00	0.00	0.00	57.14	27.89	0.00
P067625	2005	CN-GEF-Renewable Energy Scale-Up Program	0.00	0.00	0.00	40.22	0.00	38.22	-0.35	0.00
P081161	2005	CN-CHONGQING SMALL CITIES	180.00	0.00	0.00	0.00	0.00	173.02	25.79	0.00
P081346	2005	CN-LIUZHOU ENVIRONMENT MGMT	100.00	0.00	0.00	0.00	0.00	86.01	1.61	0.00
P072721	2005	CN-GEF-Heat Reform & Bldg Egy Eff.	0.00	0.00	0.00	18.00	0.00	15.09	4.37	0.00
P057933	2005	CN-TAI BASIN URBAN ENVMT	61.00	0.00	0.00	0.00	0.00	37.12	8.72	0.00
P071094	2005	CN - Poor Rural Communities Development	100.00	0.00	0.00	0.00	0.00	87.43	31.00	0.00
P086505	2005	CN-NINGBO WATER & ENVMT	130.00	0.00	0.00	0.00	0.00	112.86	-0.14	0.00
P087291	2005	CN-PCF Jincheng Coal Bed Methane Project	0.00	0.00	0.00	0.00	0.00	18.83	0.00	0.00
P073002	2004	CN-Basic Education in Western Areas	100.00	0.00	0.00	0.00	0.00	44.94	38.45	0.00
P075035	2004	CN - GEF-Hai Basin Integr. Wat. Env.Man.	0.00	0.00	0.00	17.00	0.00	12.15	8.28	0.00
P075602	2004	CN-2nd National Railways (Zhe-Gan Line)	200.00	0.00	0.00	0.00	1.00	33.21	-39.12	-40.12
P075728	2004	CN-GUANGDONG/PRD UR ENVMT	128.00	0.00	0.00	0.00	0.64	79.55	-10.34	0.00
P077137	2004	CN-4th Inland Waterways	91.00	0.00	0.00	0.00	0.46	68.14	14.27	13.77

P077615	2004	CN-GEF-Gansu & Xinjiang Pastoral Develop	0.00	0.00	0.00	10.50	0.00	6.95	7.07	0.00
P081749	2004	CN-Hubei Shiman Highway	200.00	0.00	0.00	0.00	1.00	50.09	-5.57	0.00
P084003	2004	CN-GEF GUANGDONG PRD URB ENV	0.00	0.00	0.00	10.00	0.00	9.82	3.33	0.00
P065035	2004	CN-Gansu & Xinjiang Pastoral Development	66.27	0.00	0.00	0.00	0.00	32.85	11.63	0.00
P065463	2004	CN-Jiangxi Integrated Agric. Modern.	100.00	0.00	0.00	0.00	0.00	72.12	28.49	0.00
P066955	2004	CN-ZHEJIANG URBAN ENVMT	133.00	0.00	0.00	0.00	0.00	95.14	12.96	0.00
P069852	2004	CN-Wuhan Urban Transport	200.00	0.00	0.00	0.00	1.00	115.31	108.27	0.00
P040599	2003	CN-TIANJIN URB DEV II	150.00	0.00	0.00	0.00	0.00	132.04	51.85	0.00
P058847	2003	CN-3rd Xinjiang Hwy Project	150.00	0.00	0.00	0.00	0.00	30.70	20.03	0.00
P067337	2003	CN-2nd GEF Energy Conservation	0.00	0.00	0.00	26.00	0.00	7.57	25.68	0.00
P068058	2003	CN-Yixing Pumped Storage Project	145.00	0.00	0.00	0.00	0.00	72.40	31.27	0.00
P076714	2003	CN-2nd Anhui Hwy	250.00	0.00	0.00	0.00	0.00	87.60	13.85	0.00
P070191	2003	CN-SHANGHAI URB ENVMT APL I	200.00	0.00	0.00	0.00	0.00	111.53	39.24	0.00
P070441	2003	CN-Hubei Xiaogan Xiangfan Hwy	250.00	0.00	0.00	0.00	0.00	35.81	27.47	0.00
P060029	2002	CN-GEF-Sustain. Forestry Dev	0.00	0.00	0.00	16.00	0.00	6.88	13.53	0.00
P068049	2002	CN-Hubei Hydropower Dev in Poor Areas	105.00	0.00	0.00	0.00	0.00	22.92	11.99	0.00
P070459	2002	CN-Inner Mongolia Hwy Project	100.00	0.00	0.00	0.00	0.00	20.33	1.66	0.00
P058846	2002	CN-Natl Railway Project	160.00	0.00	0.00	0.00	5.00	9.21	14.21	0.00
P064729	2002	CN-Sustainable Forestry Development	93.90	0.00	0.00	0.00	0.00	27.97	15.41	0.00
P071147	2002	CN-Tuberculosis Control Project	104.00	0.00	0.00	0.00	0.00	47.49	23.20	0.00
P051859	2001	CN-LIAO RIVER BASIN	100.00	0.00	0.00	0.00	0.00	18.04	16.03	0.00
P056199	2001	CN-3rd Inland Waterways	100.00	0.00	0.00	0.00	0.00	16.15	7.82	0.00
P047345	2001	CN-HUAI RIVER POLLUTION CONTROL	105.50	0.00	0.00	0.00	0.00	30.82	30.82	-0.93
P045915	2001	CN-Urumqi Urban Transport	100.00	0.00	0.00	0.00	0.00	32.47	32.47	0.00
P056596	2001	CN-Shijiazhuang Urban Transport	100.00	0.00	0.00	0.00	0.00	53.90	53.90	0.00
P049436	2000	CN-CHONGQING URBAN ENVMT	200.00	0.00	0.00	0.00	29.50	71.97	100.40	-0.87
P045910	2000	CN-HEBEI URBAN ENVIRONMENT	150.00	0.00	0.00	0.00	0.00	34.62	31.28	0.00
P042109	2000	CN-BEIJING ENVIRONMENT II	349.00	0.00	0.00	25.00	26.51	197.90	224.41	-5.11
P064730	2000	CN-Yangtze Dike Strengthening	210.00	0.00	0.00	0.00	0.00	71.23	71.23	4.55
P056424	2000	CN-Tongbai Pumped Storage	320.00	0.00	0.00	0.00	100.00	34.76	139.96	2.02
P064924	2000	CN-GEF-BEIJING ENVMT II	0.00	0.00	0.00	25.00	0.00	19.90	25.00	5.48
P058843	2000	CN-Guangxi Highway	200.00	0.00	0.00	0.00	19.70	3.37	23.07	3.37
P036953	1999	CN-HEALTH IX (Shiyong Wang, Backup)	10.00	50.00	0.00	0.00	0.40	16.73	15.61	15.61
P038121	1999	CN-GEF-RENEWABLE ENERGY DEVELOPMENT	0.00	0.00	0.00	35.00	0.00	9.86	34.77	26.95
P042299	1999	CN-Tec Coop Credit IV	10.00	35.00	0.00	0.00	5.84	13.38	17.12	0.00
P051856	1999	CN-Accounting Reform & Development	27.40	5.60	0.00	0.00	0.00	7.15	7.04	1.21
P051705	1999	CN-Fujian II Highway	200.00	0.00	0.00	0.00	0.00	15.20	15.20	9.12
P036414	1998	CN-GUANGXI URBAN ENVMT	72.00	20.00	0.00	0.00	13.48	19.16	32.05	-1.63
P003614	1998	CN-Guangzhou City Transport	200.00	0.00	0.00	0.00	20.00	49.02	69.02	49.02
P003566	1998	CN-BASIC HEALTH (HLTH8)	0.00	85.00	0.00	0.00	0.00	2.83	1.39	0.00
P003539	1998	CN-Sustainable Coastal Resources Dev.	100.00	0.00	0.00	0.00	2.06	17.60	19.67	17.60
P036405	1997	CN-Wanjiazhai Water	400.00	0.00	0.00	0.00	75.00	4.41	79.41	4.41
Total:			9,164.40	195.60	0.00	260.42	301.59	6,125.97	1,699.41	104.45

CHINA
STATEMENT OF IFC's
Held and Disbursed Portfolio
In Millions of US Dollars

FY Approval	Company	Committed				Disbursed			
		IFC				IFC			
		Loan	Equity	Quasi	Partic.	Loan	Equity	Quasi	Partic.
2002	ASIMCO	0.00	10.00	0.00	0.00	0.00	10.00	0.00	0.00
2006	ASIMCO	0.00	0.00	4.12	0.00	0.00	0.00	3.61	0.00
2005	BCCB	0.00	59.21	0.00	0.00	0.00	59.03	0.00	0.00
2003	BCIB	0.00	0.00	12.04	0.00	0.00	0.00	0.00	0.00
2006	BUFH	8.14	0.00	0.00	0.00	8.14	0.00	0.00	0.00
2005	Babei	0.00	5.00	0.00	0.00	0.00	5.00	0.00	0.00
	Babei Necktie	11.00	0.00	0.00	6.00	8.94	0.00	0.00	4.88
1999	Bank of Shanghai	0.00	21.76	0.00	0.00	0.00	21.76	0.00	0.00
2000	Bank of Shanghai	0.00	3.84	0.00	0.00	0.00	3.84	0.00	0.00
2002	Bank of Shanghai	0.00	24.67	0.00	0.00	0.00	24.67	0.00	0.00
2005	BioChina	0.00	3.70	0.00	0.00	0.00	3.13	0.00	0.00
2002	CDH China Fund	0.00	2.02	0.00	0.00	0.00	0.00	0.00	0.00
2005	CDH China II	0.00	17.99	0.00	0.00	0.00	11.38	0.00	0.00
2006	CDH Venture	0.00	20.00	0.00	0.00	0.00	0.51	0.00	0.00
2005	CT Holdings	0.00	0.00	40.00	0.00	0.00	0.00	0.00	0.00
2004	CUNA Mutual	0.00	10.53	0.00	0.00	0.00	0.00	0.00	0.00
2006	Capital Today	0.00	25.00	0.00	0.00	0.00	0.32	0.00	0.00
2005	Changyu Group	0.00	18.07	0.00	0.00	0.00	18.07	0.00	0.00
1998	Chengdu Huarong	3.36	3.20	0.00	3.13	3.36	3.20	0.00	3.13
2004	China Green Ener	20.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00
2004	China Re Life	0.00	0.27	0.00	0.00	0.00	0.27	0.00	0.00
1994	China Walden Mgt	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00
2006	Chinasoft	0.00	0.00	15.00	0.00	0.00	0.00	10.00	0.00
2004	Colony China	0.00	15.31	0.00	0.00	0.00	9.29	0.00	0.00
2004	Colony China GP	0.00	0.84	0.00	0.00	0.00	0.49	0.00	0.00
2006	Conch	81.50	40.93	0.00	0.00	81.50	0.00	0.00	0.00
2006	Dagang NewSpring	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	Darong	10.00	0.24	0.00	8.00	6.67	0.24	0.00	5.33
2006	Deqingyuan	0.00	2.85	0.00	0.00	0.00	2.85	0.00	0.00
1994	Dynamic Fund	0.00	2.21	0.00	0.00	0.00	2.01	0.00	0.00
2007	Epure	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
2004	Fenglin	17.64	0.00	6.00	13.47	13.64	0.00	6.00	12.53
2006	Fenglin HJ MDF	0.23	0.00	0.00	3.27	0.00	0.00	0.00	0.00
2005	Five Star	0.00	0.00	7.00	0.00	0.00	0.00	0.00	0.00
2006	GDIH	50.85	0.00	0.00	0.00	50.85	0.00	0.00	0.00
2003	Great Infotech	0.00	1.73	0.00	0.00	0.00	1.03	0.00	0.00
2006	Hangzhou RCB	0.00	10.85	0.00	0.00	0.00	0.00	0.00	0.00
2005	HiSoft Tech	0.00	4.00	0.00	0.00	0.00	3.00	0.00	0.00
2006	HiSoft Tech	0.00	4.34	0.00	0.00	0.00	1.74	0.00	0.00
2004	IB	0.00	52.18	0.00	0.00	0.00	52.18	0.00	0.00
2004	Jiangxi Chenming	40.00	12.90	0.00	18.76	40.00	12.90	0.00	18.76

2006	Launch Tech	0.00	8.35	0.00	0.00	0.00	8.33	0.00	0.00
2001	Maanshan Carbon	5.25	2.00	0.00	0.00	5.25	2.00	0.00	0.00
2005	Maanshan Carbon	11.00	1.00	0.00	0.00	5.00	1.00	0.00	0.00
2005	Minsheng	15.75	0.00	0.00	0.00	7.00	0.00	0.00	0.00
2006	Minsheng & IB	25.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	Minsheng Bank	0.00	23.50	0.00	0.00	0.00	23.50	0.00	0.00
2005	Minsheng Bank	0.00	2.80	0.00	0.00	0.00	2.79	0.00	0.00
2001	NCCB	0.00	8.94	0.00	0.00	0.00	8.82	0.00	0.00
1996	Nanjing Kumho	0.00	3.81	0.00	0.00	0.00	3.81	0.00	0.00
2004	Nanjing Kumho	31.38	2.23	0.00	0.00	31.38	2.23	0.00	0.00
2006	Neophotonics	0.00	0.00	10.00	0.00	0.00	0.00	10.00	0.00
2001	New China Life	0.00	5.83	0.00	0.00	0.00	5.83	0.00	0.00
2005	New Hope	0.00	0.00	45.00	0.00	0.00	0.00	0.00	0.00
1995	Newbridge Inv.	0.00	0.22	0.00	0.00	0.00	0.22	0.00	0.00
2005	North Andre	8.00	6.74	0.00	0.00	0.00	4.25	0.00	0.00
2003	PSAM	0.00	2.01	0.00	0.00	0.00	0.00	0.00	0.00
	RAK China	13.00	0.00	0.00	0.00	13.00	0.00	0.00	0.00
2006	Renaissance Sec	0.00	0.00	20.04	0.00	0.00	0.00	0.00	0.00
2006	Rongde	0.00	35.00	0.00	0.00	0.00	31.38	0.00	0.00
	SAC HK Holding	0.00	1.60	0.00	0.00	0.00	1.00	0.00	0.00
2003	SAIC	12.00	0.00	0.00	0.00	12.00	0.00	0.00	0.00
2006	SBCVC	0.00	20.00	0.00	0.00	0.00	2.00	0.00	0.00
2000	SEAF SSIF	0.00	3.74	0.00	0.00	0.00	3.37	0.00	0.00
	SH Keji IT	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2004	SHCT	38.18	0.00	0.00	28.64	29.04	0.00	0.00	21.78
2004	SIBFI	0.14	0.07	0.00	0.00	0.00	0.07	0.00	0.00
1998	Shanghai Krupp	19.25	0.00	0.00	36.75	19.25	0.00	0.00	36.75
2006	Shanshui Group	50.00	5.50	2.20	0.00	50.00	5.50	0.00	0.00
1999	Shanxi	12.61	0.00	0.00	0.00	12.61	0.00	0.00	0.00
	SinoSpring	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00
	Stora Enso	20.83	0.00	0.00	4.17	11.00	0.00	0.00	0.00
2005	Stora Enso	29.17	0.00	0.00	20.83	0.00	0.00	0.00	0.00
2006	Stora Enso	50.00	0.00	0.00	175.00	0.00	0.00	0.00	0.00
2006	TBK	4.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
2006	VeriSilicon	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
	Wanjie High-Tech	9.89	0.00	0.00	0.00	9.89	0.00	0.00	0.00
2004	Wumart	0.00	1.62	0.00	0.00	0.00	1.62	0.00	0.00
2003	XACB	0.00	17.95	0.00	0.00	0.00	0.64	0.00	0.00
2004	Xinao Gas	25.00	10.00	0.00	0.00	25.00	10.00	0.00	0.00
2006	Zhejiang Glass	50.00	24.96	0.00	18.00	0.00	0.00	0.00	0.00
2003	Zhengye-ADC	10.43	0.00	0.00	4.87	10.43	0.00	0.00	4.87
2002	Zhong Chen	0.00	4.78	0.00	0.00	0.00	4.78	0.00	0.00
2006	Zhongda_Yanjin	21.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total portfolio:		733.58	577.30	181.40	340.89	470.95	371.06	29.61	108.03

FY Approval	Company	Approvals Pending Commitment			
		Loan	Equity	Quasi	Partic.
2002	SML	0.00	0.00	0.00	0.00
2004	NCFL	0.00	0.00	0.02	0.00
2007	Xinao CTC	0.04	0.01	0.00	0.14
2004	China Green	0.00	0.00	0.01	0.00
2006	Launch Tech	0.01	0.00	0.00	0.00
2005	MS Shipping	0.00	0.01	0.00	0.00
2003	Peak Pacific 2	0.00	0.01	0.00	0.00
Total pending commitment:		0.05	0.03	0.03	0.14

Annex 14: Country at a Glance

EAST ASIA AND PACIFIC: China Energy Efficiency Financing

POVERTY and SOCIAL		China	East Asia & Pacific	Lower-middle-income
2005				
Population, mid-year (<i>millions</i>)		1,304.5	1,885	2,475
GNI per capita (<i>Atlas method, US\$</i>)		1,740	1,627	1,918
GNI (<i>Atlas method, US\$ billions</i>)		2,269.8	3,067	4,747
Average annual growth, 1999-05				
Population (%)		0.7	0.9	1.0
Laborforce (%)		1.0	1.3	1.4
Most recent estimate (latest year available, 1999-05)				
Poverty (% of population below national poverty line)		..	..	..
Urban population (% of total population)		40	41	50
Life expectancy at birth (years)		71	70	70
Infant mortality (per 1,000 live births)		26	29	33
Child malnutrition (% of children under 5)		8	15	12
Access to an improved water source (% of population)		77	79	82
Literacy (% of population age 15+)		91	91	89
Gross primary enrollment (% of school-age population)		118	115	114
Male		118	116	115
Female		117	114	113

Development diamond*

Life expectancy

GNI per capita

Gross primary enrollment

Access to improved water source

China

Lower-middle-income group

KEY ECONOMIC RATIOS and LONG-TERM TRENDS					
	1985	1995	2004	2005	
GDP (US\$ billions)	304.9	728.0	1,931.7	2,228.9	
Gross capital formation/GDP	37.8	39.3	38.7	..	
Exports of goods and services/GDP	10.0	23.1	34.0	..	
Gross domestic savings/GDP	33.6	41.5	41.2	..	
Gross national savings/GDP	34.0	40.1	42.2	..	
Current account balance/GDP	-3.8	0.8	3.6	5.0	
Interest payments/GDP	0.2	0.6	0.2	..	
Total debt/GDP	5.5	16.2	12.9	..	
Total debt service/exports	7.7	8.6	3.5	..	
Present value of debt/GDP	..	..	12.5	..	
Present value of debt/exports	..	..	35.7	..	
	1985-95	1995-05	2004	2005	2005-09
<i>(average annual growth)</i>					
GDP	9.7	8.8	10.1	9.9	8.0
GDP per capita	8.2	8.0	9.4	9.2	7.3
Exports of goods and services	9.4	19.7	28.4	23.6	10.3

Economic ratios*

Trade

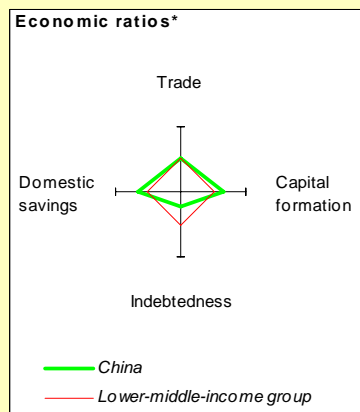
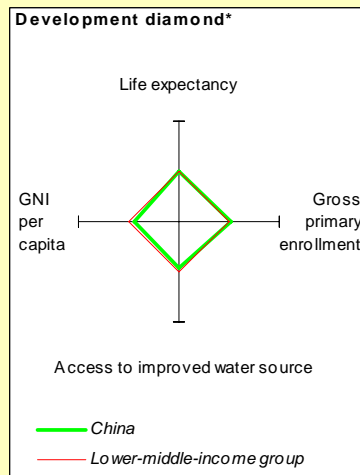
Domestic savings

Capital formation

Indebtedness

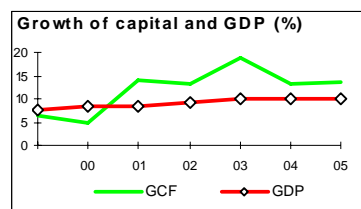
China

Lower-middle-income group



STRUCTURE of the ECONOMY

	1985	1995	2004	2005
(% of GDP)				
Agriculture	28.4	19.8	13.1	..
Industry	43.1	47.2	46.2	..
Manufacturing	34.9	..	..	..
Services	28.5	33.1	40.7	..
Household final consumption expenditure	53.2	47.5	48.5	..
General gov't final consumption expenditure	13.2	11.0	10.2	..
Imports of goods and services	14.1	20.9	31.4	..
	1985-95	1995-05	2004	2005
(average annual growth)				
Agriculture	4.2	3.3	6.3	5.0
Industry	12.8	9.9	11.1	10.8
Manufacturing	10.0	..	..	..
Services	9.5	9.7	9.8	10.1
Household final consumption expenditure	10.2	5.7	1.1	..
General gov't final consumption expenditure	9.4	8.9	6.8	..
Gross capital formation	9.4	10.1	13.0	13.5
Imports of goods and services	10.3	17.4	22.5	15.3



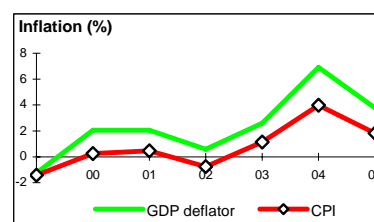
Note: 2005 data are preliminary estimates.

This table was produced from the Development Economics LDB database.

* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

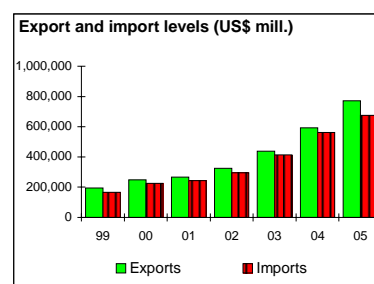
PRICES and GOVERNMENT FINANCE

	1985	1995	2004	2005
Domestic prices (% change)				
Consumer prices	..	16.9	4.0	1.8
Implicit GDP deflator	10.1	13.7	6.9	3.8
Government finance (% of GDP, includes current grants)				
Current revenue	28.0	10.8	16.6	17.5
Current budget balance	7.3	0.6	1.7	2.0
Overall surplus/deficit	0.0	-1.5	-1.5	-1.3



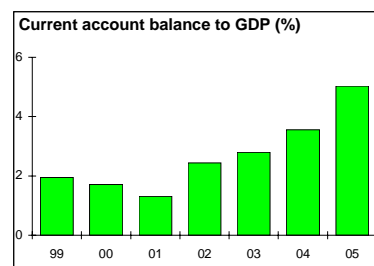
TRADE

	1985	1995	2004	2005
(US\$ millions)				
Total exports (fob)	27,350	148,780	593,369	771,511
Food	3,803	9,954	18,870	..
Mineral fuels, lubricants, and related material	7,132	5,332	14,476	..
Manufactures	13,522	127,295	552,818	727,191
Total imports (cif)	42,252	132,084	561,423	674,331
Food	1,553	6,132	9,156	..
Fuel and energy	172	5,127	48,003	..
Capital goods	16,239	52,642	252,624	230,369
Export price index (2000=100)	52	118	102	106
Import price index (2000=100)	74	107	112	119
Terms of trade (2000=100)	70	110	91	88



BALANCE of PAYMENTS

	1985	1995	2004	2005
(US\$ millions)				
Exports of goods and services	30,489	167,974	655,827	843,537
Imports of goods and services	43,092	151,882	606,543	746,150
Resource balance	-12,602	16,092	49,284	97,386
Net income	841	-11,774	-3,523	4,668
Net current transfers	243	1,434	22,898	10,000
Current account balance	-11,518	5,752	68,659	112,055
Financing items (net)	6,096	16,711	137,705	98,000
Changes in net reserves	5,422	-22,463	-206,364	-210,055

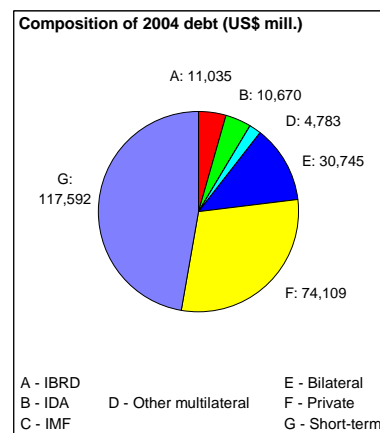


Memo:

Reserves including gold (US\$ millions)	..	80,277	622,945	826,303
Conversion rate (DEC, local/US\$)	2.9	8.4	8.3	8.2

EXTERNAL DEBT and RESOURCE FLOWS

	1985	1995	2004	2005
(US\$ millions)				
Total debt outstanding and disbursed	16,696	118,090	248,934	..
IBRD	498	7,209	11,035	11,140
IDA	431	7,038	10,670	9,741
Total debt service	2,478	15,066	23,657	..
IBRD	26	810	1,054	1,139
IDA	4	63	264	296
Composition of net resource flows				
Official grants	117	330	381	..
Official creditors	1,117	7,902	16	..
Private creditors	2,867	5,013	7,970	..
Foreign direct investment (net inflows)	1,659	35,849	54,936	..
Portfolio equity (net inflows)	0	0	10,923	..
World Bank program				
Commitments	1,092	3,148	1,285	..
Disbursements	565	2,269	1,188	1,131
Principal repayments	0	364	999	1,004
Net flows	565	1,905	190	127
Interest payments	29	509	319	430
Net transfers	536	1,396	-130	-303



Note: This table was produced from the Development Economics LDB database.

8/12/06

Annex 15: Incremental Cost Analysis

EAST ASIA AND PACIFIC: China Energy Efficiency Financing

National Development and Global Environment Context

China's rapid ascendance to world manufacturing powerhouse has not been accompanied by a transition of its industrial sector to world-class energy efficiency. The sharp increase in coal consumption since 2001, driven by surging demand in power generation and energy-intensive industries, has helped drive up the energy intensity of the economy, reversing a descending trend of over 20 years. This has heightened the urgency in the government to accelerate and scale up energy efficiency policy interventions.

The continuing fast expansion of China's economy and the large size of its (existing) inefficient sectors require dual attentions to energy efficiency improvements. China must seize the opportunity of growth and strive for adopting state-of-the-art energy technologies in all new capital investments. It will also need to invest in energy efficiency renovation of the existing physical plants and facilities that will continue to operate in the next 10–20 years, or even longer. The consensus among Chinese experts is that most of the existing capital stocks in China's energy-intensive industries, especially those in medium and large-sized enterprises, will still remain in production until at least 2020.¹⁷ There is a window of opportunity to rehabilitate and upgrade the existing capital stocks to improve their energy efficiency in the next five years or so.

The government has adopted a comprehensive policy to increase energy efficiency investments in major energy-consuming sectors, especially in energy-intensive industries, with strong efforts during the 11th Five-Year Plan period (2006–10). The proposed project, especially the GEF-supported components, will assist the implementation of national energy conservation programs with the objective of building capacity for long-term and sustained energy efficiency improvements, focusing on removing barriers to financing energy conservation investments in medium-size to large manufacturing facilities in energy-intensive industries where major energy-efficiency renovations have stalled.

The energy-intensive manufacturing sectors, such as iron and steel, building materials, and petrochemical industries, consume approximately 50 percent of China's total primary energy and have great potential for cost-effective energy saving investments. Even the good practices in relatively modern large facilities of these industries still require 20–50 percent more energy per unit physical output than international best practices (Table A1).

TABLE A1: ENERGY USE PER UNIT PHYSICAL OUTPUT—LARGE ENTERPRISES VS. INTERNATIONAL BEST PRACTICES, 2000

	<i>Raw steel</i>	<i>Cement</i>	<i>Plate glass</i>	<i>Synthetic ammonia</i>	<i>Ethylene</i>	<i>Petroleum refining</i>
International best practice	100	100	100	100	100	100
Large enterprises in China	122	140	150	137	141	140

¹⁷ For example, China now produces 30 percent and 45 percent of the world's raw steel and cement, respectively. Most of the production capacities were added in the past 5–10 years.

Note: According to the State Statistical Bureau, industrial enterprises with an annual revenue at or above Y 300 million are classified as “large.”

Source: State Development and Reform Commission, Mid to Long-Term Energy Conservation Plan, 2004.

The government has set a target of achieving 560 Mtce energy savings between 2005 and 2010. It is estimated that one third of the expected energy savings will come from technical improvements, and the rest from structural changes of the economy. The energy savings potential achievable through energy efficiency renovation among the existing medium and large-sized manufacturing facilities of iron and steel, cement, plate glass, synthetic ammonia, ethylene, and petroleum refining are between 30 Mtce and 50 Mtce per year. Much energy savings can be realized by energy conservation investments with less than five years of simple payback time.¹⁸ These represent major opportunities for GEF intervention and will result in significant amount of reduction in carbon dioxide emissions.

Main Barriers to Scaling up Investments in Industrial Energy Efficiency Renovations

The needs for energy efficiency renovation in medium and large-sized manufacturing facilities in energy-intensive industries are large. However, actual investments in such investment projects remain limited. For examples, coke dry quenching, a reliable technology with attractive financial returns (about four years of simple payback time), is applied in only 10 percent of the medium and large-sized coking plants. The main barriers to scaling up investments in major energy-intensive manufacturing facilities include the following:

1. ***Perceived high technical and financial risks by industrial enterprises.*** Compared with small-scale industrial energy conservation projects, which usually cost about US\$1 million per project and have very short payback periods (one to two years), medium and large-sized projects typically are technically more complex, sometimes involving new technologies and optimization of production processes, have no solid record of reliable financial returns, and require longer payback periods. Such characteristics often lead enterprises to defer or abandon major investments in energy conservation renovations in favor of production expansions, which normally fit well with the general growth pressure in the Chinese economy.
2. ***Unfamiliarity with industrial energy conservation technologies and a lack of knowledge of energy efficiency business opportunities among Chinese banks.*** Chinese banks are accustomed to providing loans for production expansion projects and have little experience in financing energy conservation projects, in part because of the lack of demand. The lack of specialty experience and skills and the large variety of energy conservation technologies do not encourage the banks to start their own initiatives in energy efficiency lending because of perceived difficulties for repeat businesses and the high costs of project appraisal and supervision. In addition, energy conservation investments usually do not generate additional revenues, but rather contribute to profit margins through a reduction in energy expenditures. This makes it difficult for banks to identify and trap cash flows from such projects and take energy savings as assets of

¹⁸ Consultant report: Energy Efficiency Renovation Technologies in Iron and Steel, Construction Materials, and Petro-Chemical Industries of China; Tokyo Energy Efficiency Group, December 2006.

sufficient market value to justify a loan, often resulting in unattractive financing cost and terms. As such, Chinese banks have not developed operational capacity for direct energy-efficiency lending to industrial enterprises, nor do they have a good understanding of the major investment opportunities in industrial energy conservation.

3. ***Insufficient institutional capacity, especially at the national level, to address the pressing needs of scaling up energy-efficiency investments.*** The government has set ambitious goals for energy efficiency improvements for the 11th Five-Year Plan period and in the next 15 years. Achieving these goals will require a combination of market-based policy instruments and enforcement of regulations and standards. In the wake of the great expansion of energy-intensive industries in the last 10 years or so, the government's capability to effectively implement its energy efficiency policies and programs has declined considerably in relative terms. Given the size and large weight of the energy-intensive industries in China's economy, as well as the widespread inefficient practices among their major facilities, policy and regulatory interventions need to be strengthened significantly to encourage industrial enterprise to undertake energy efficiency investments.

Baseline Scenario

Without the proposed project, it is expected that energy efficiency financing for medium and large-sized industrial energy conservation investments through direct lending by domestic banks will remain negligible in the next five years. The participating banks will not conduct explicit marketing and pipeline development activities for energy efficiency lending, nor will they seek to establish the energy efficiency lending business lines in a systematic manner (with specialized unit and budget).

Under the baseline scenario the implementation of the government's energy conservation policies and programs will also be affected negatively because of a slower pace in developing the capacity of the soon-to-be-established NECC and inadequate resources for other time-sensitive activities, for example, the midterm review of the energy efficiency programs of the 11th Five-Year Plan.

GEF Alternative and Barrier-Removal Activities

The proposed project will remove the above barriers through targeted technical assistance activities and an output-based subsidy to partially cover the operating costs of new energy efficiency lending business. The details are described in **Table A2**.

TABLE A2: EFFECTS AND OUTCOMES OF BARRIER-REMOVAL ACTIVITIES

<i>Barrier-removal activities</i>	<i>Effects and outcomes</i>
Support for Promotion of Energy Efficiency Financing (Component A of the Proposed Project)	Addressing Barriers 1 and 2 while also supporting the removal of Barrier 3.
A1. Assistance to participating banks in business startup, capacity building, marketing and subproject pipeline development, subproject due diligence,	Accompanied by an infusion of an IBRD onlending loan of US\$200 million IBRD, this subcomponent will help jumpstart the energy efficiency lending business

<p>development of energy conservation financial products and support to cover part of the incremental cost of maintaining the mandated new energy efficiency business unit or team.</p>	<p>of three participating banks (alternatively referred as PFIs). With a focus on learning by doing, GEF technical assistance will help the banks develop internal capacity to identify, prepare, and appraise industrial conservation investment projects, build sectorwise specialty areas and business lines, as well as manage risks. In addition to the US\$200 million IBRD onlent funds, the three participating banks are expected to lend another US\$200 million from their own funds for industrial energy conservation investment over five years.</p> <p>A GEF grant will also provide support for marketing and energy conservation subproject pipeline development, which will raise awareness of the new energy efficiency lending business lines among medium and large-sized industrial facilities and help the participating banks to develop lending pipelines.</p> <p>GEF assistance will provide support to the PFIs for due diligence of energy conservation subprojects, with which the banks are not familiar and thus build the expertise required to scale-up energy conservation lending. In addition, GEF grant will support PFIs to develop financial instruments and risk management tools which are tailored towards energy conservation lending.</p> <p>A portion of GEF assistance will be disbursed as an output-based payment based on independent verification of energy conservation lending by the banks. Disbursing part of the incremental cost assistance through the output-based payment scheme is expected to encourage the banks to quickly scale up their energy efficiency lending business.</p> <p>The outcome will be significantly shortened learning curves for the participating banks, attainment of a critical mass of bank lending to medium and large-sized industrial energy conservation projects, and a successfully demonstrated energy efficiency lending business development model that can be replicated by other domestic banks.</p>
<p>A2. Assistance to other banks in establishment of energy efficiency lending business</p>	<p>Similar GEF energy efficiency business development assistance will be extended to two nonparticipating banks (without IBRD loan) at a later phase of the project to leverage additional energy efficiency lending.</p>
<p>A3. Assistance the overall banking sector</p>	<p>This subcomponent will disseminate the early experience gained from the energy efficiency lending practices of the participating banks and serve as a platform/forum for knowledge exchange and energy efficiency business promotion.</p>

	The outcome will be a broad awareness of the opportunities of and financing products for industrial energy conservation, which will lead to further expansion of the energy efficiency lending business beyond the direct beneficiary banks.
A4. Assistance to energy conservation project demonstration	<p>This will support the preparation and implementation of two or three industrial energy conservation projects in sectors with large replication potentials, but with significant project development difficulties, focusing primarily on preinvestment activities, such as feasibility studies, due diligence, and financing arrangements.</p> <p>In addition, assistance will be provided for the development of an assessment, supervision, and monitoring system for government-supported or cofinanced industrial energy conservation projects. This will help streamline the selection and approval process of projects, laying a foundation for scaling up government fiscal and financial support for industrial energy conservation on one hand, and helping industrial enterprises better access government energy efficiency investment incentives on the other.</p>
Monitoring and verification of PFIs' energy conservation lending (Component B2 of the proposed project)	This will mainly support independent verification of energy conservation lending for the disbursement of the output-based incentive grant, as well as monitoring of energy conservation subproject performance.
National Policy Support and Capacity Building (Component C of the Proposed Project)	Addressing Barrier 3.
C1. Assistance to the establishment of the NECC	<p>To support the government's efforts to strengthen the institutional capacity of energy efficiency interventions, the proposed project will provide major assistance to the establishment and initial operation of NECC, focusing on strategic planning, work program development, and capacity enhancement.</p> <p>The outcome will be a well-positioned organization able to provide critical and effective supports to the government in the implementation of major national energy conservation policies and programs.</p>
C2. Assistance to the implementation of the 11 th Five-Year Plan	This subcomponent will help the government address urgent policy and institutional issues arising from the first two years of implementing the priority energy efficiency programs of the 11 th Five-Year Plan, thus easing the impediment to achieving the target of reducing the energy intensity of GDP by 20%.

GEF cofinancing for management, monitoring, and evaluation of the proposed project also is proposed (Component D). This will help ensure the efficient implementation of the

proposed project and defray part of the costs of administrative and technical services for project management, monitoring, and evaluation.

Incremental Costs and Global Benefits

The incremental costs of the GEF alternative include (a) the costs associated with the technical assistance activities; (b) the capital cost of additional energy conservation investments; (c) the costs incurred by beneficiary banks for setting up and operating new energy conservation lending businesses; and (d) the costs of administrative and technical support to project management, monitoring, and evaluation. The total estimated incremental cost is US\$591.65 million. The main assumptions of the incremental cost calculation are described in the Incremental Cost and Benefit Matrix at the end of section. The detailed incremental cost estimates and proposed GEF cofinancing are presented in **Table A3**.

TABLE A3: ESTIMATED INCREMENTAL COST AND PROPOSED GEF COFINANCING

<i>Components and Activities</i>	<i>Incremental cost (US\$)</i>	<i>GEF (US\$)</i>
A. Promotion of Energy Efficiency Financing	16,650,000	9,900,000
<i>A1. Assistance to PFIs</i>	<i>11,150,000</i>	<i>6,300,000</i>
A1a. Business startup	1,200,000	600,000
A1b. Capacity building	1,600,000	900,000
A1c. Marketing and pipeline development	1,600,000	750,000
A1d. Subproject due diligence	1,750,000	1,200,000
A1e. Financial products development	500,000	300,000
A1f. Output-based incremental cost support	4,500,000	2,550,000
<i>A2. Assistance to other banks</i>	<i>1,600,000</i>	<i>800,000</i>
A2a. Business startup	600,000	300,000
A2b. Capacity building	600,000	300,000
A2c. Due diligence	400,000	200,000
<i>A3. Assistance to overall banking sector</i>	<i>300,000</i>	<i>300,000</i>
<i>A4. Assistance to energy conservation project demonstration</i>	<i>3,600,000</i>	<i>2,500,000</i>
A4a. Preparation of pilot projects	2,200,000	1,800,000
A4b. Development of an assurance system	1,400,000	700,000
B. Energy Conservation Investment Lending	571,400,000	4,500,000
<i>B1. Energy conservation lending by PFIs</i>	<i>571,000,000</i>	<i>0</i>
<i>B3. Monitoring and verification of energy conservation lending</i>	<i>400,000</i>	<i>400,000</i>
C. National Policy Support and Capacity Building	2,800,000	2,800,000
<i>C1. Assistance to the establishment of NECC</i>	<i>2,050,000</i>	<i>2,050,000</i>
C1a. NECC startup	300,000	300,000
C1b. Capacity development	1,300,000	1,300,000
C1c. Development of awareness programs	250,000	250,000
C1d. Assessment of energy auditing industry	200,000	200,000
<i>C2. Assistance to priority energy conservation programs</i>	<i>750,000</i>	<i>750,000</i>
C2a. 11th Five-Year Plan midterm review	250,000	250,000
C2b. Special studies	300,000	300,000

C2c. Adoption of international best practices	200,000	200,000
D. Project Implementation Support and Reporting	800,000	400,000
<i>D1. Supervision and reporting (staff and consultants)</i>	<i>430,000</i>	<i>320,000</i>
<i>D2. Operation (office, utilities, travel, etc.)</i>	<i>370,000</i>	<i>80,000</i>
Total project	591,650,000	13,500,000

Based on case studies of potential industrial energy conservation investment projects, the expected incremental energy efficiency investment volume of US\$571 million over five years (US\$200 million IBRD funds, US\$200 million of additional PFI lending and US\$171 million of equity contribution by beneficiary enterprises) is expected to result in about 1.6 Mtce of avoided energy consumption by the end of the project implementation period (see Table A4 below). Assuming a 20-year life span of the subproject investment, the cumulative avoided energy consumption amount will be 32 Mtce. The direct global benefit of the proposed project is expected to be 3.9 million tons and 78 million tons, respectively, of CO₂ emissions avoidance during the project period and over a 20-year life span.¹⁹

Table A4: Energy Conservation Investment and Energy Savings Resulting from the Proposed Project

	Year 1	Year 2	Year 3	Year 4	Year 5
Energy Conservation investment (US\$ million)	57	114	171	115	114
Energy Savings Yield (tce/yr per US\$ million)	2,800	2,800	2,800	2,800	2,800
New Energy Savings Capacity (tce/yr)	159,600	319,200	478,800	319,200	319,200
Cumulative Energy Consumption Avoided (tce/yr)					1,596,000

Without the proposed project (baseline), the total amount of energy conservation investments from the participating banks will be negligible over the next five years. Therefore, the incremental reduction of CO₂ emissions of the proposed project is 3.9 million tons of CO₂ over five years and 78 million tons of CO₂ over 20 years. The overall undiscounted unit incremental cost is about US\$7.6 per ton of CO₂ (based on US\$591.65 million of total incremental cost), of which GEF's contribution is about US\$0.2 per ton of CO₂.

Table A4: Incremental Cost Matrix

	<i>Baseline (without project)</i>	<i>Alternative (with project)</i>	<i>Increment</i>
Domestic Benefits	None	Avoided energy consumption of 32 Mtce over 20 years.	Avoided energy consumption of 32 Mtce over 20 years.
Global Benefits	None	Avoidance of 78 million tons of CO ₂ emissions over 20 years.	Incremental reduction of 78 million tons of CO ₂ emissions over 20 years.
Costs	(1) Technical assistance (TA): US\$0 (2) Cost of capital: US\$0 (3) Energy conservation lending	(1) US\$14.95 million (2) US\$571 million (3) US\$4.9 million	(1) US\$14.95 million (2) US\$571 million (3) US\$4.9 million

¹⁹ Assuming that year 1 investments start to generate energy savings in year 3.

	<p>operation costs: US\$0 Operational cost (OC): US\$0 Monitoring and verification (M/V): US\$0</p> <p>(4) Project implementation support (PIS): US\$0</p> <p>Total baseline cost: US\$0</p>	<p>OC: US\$4.5 million M/V: US\$0.4 million</p> <p>(4) PIS: US\$0.8 million</p> <p>Total alternative cost: US\$591.65 million</p>	<p>OC: US\$4.5 million M/V: US\$0.4 million</p> <p>(4) PIS: US\$0.8 million</p> <p>Total IC: US\$591.65 million</p> <p>Proposed GEF cofinancing of IC is US\$13.5 million, including</p> <ul style="list-style-type: none"> • US\$10.15 million for technical assistance to banks, industries and government; • US\$2.55 million output-based grant for covering part of the incremental costs of energy conservation lending at PFIs; • US\$0.4 million for monitoring and verification of energy conservation lending at PFIs; and • US\$0.4 million for sharing project implementation support cost.
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Annex 16: STAP Roster Review
EAST ASIA AND PACIFIC: China Energy Efficiency Financing

Review and Comments

by

Jayant Sathaye

10 March 2007

Summary

The goal of this project is to improve energy efficiency of medium and large scale industrial enterprises, and to reduce their climate change impact. Given China's rapid industrialization and fast growth of its manufacturing sector, in this reviewer's opinion, this is precisely the type of project that the World Bank and the Global Environment Facility should be undertaking. The project is technically feasible and manageable. It reflects priorities identified in studies undertaken by leading western and Chinese laboratories and institutes, and can build on the ongoing work under the GEF China EUEEP project.

The technical and financial barriers identified by the World Bank in the proposal are familiar and widespread in most industrial establishments in developing countries. The project calls for development of sustainable energy efficiency lending practices for the industrial sector in private and public banks, and the strengthening of government capability to enforce standards, rules and regulations, and monitor energy savings. Both will greatly enhance the credibility of energy efficiency practices in China.

In summary, I find this to be an excellent project, indeed the type of project that is creative and innovative and well-targeted to produce tangible sustainable development benefits.

General and specific comments by paragraph are noted in the sections below.

General Comments

The project is aimed at improving the efficiency of industrial enterprises. Industrial enterprises tend to have significantly higher hurdle rates for energy efficiency investments than indicated by the minimum attractive FIRR in the proposed project. This could be a risk factor that could lead to lower than expected demand for energy efficiency loans from prospective industries. This risk factor should be explicitly stated in the **table** on page 12.

The project proposal would benefit by including additional discussion of the types of incentives that would encourage enterprises to borrow for energy efficiency investment and approaches by which this project could strengthen those incentives.

The proposed project focuses on supporting investments whose only benefit is derived from direct energy savings. This energy-efficiency-centric criterion may discourage investments whose main benefit is savings of material and other factor inputs. Material savings in turn yield larger savings of embodied energy. The project design should be made flexible enough to include and seek investment opportunities that capture non-energy and embodied-energy benefits.

The main text of the document, i.e., description of Project Components on pages 5-6, makes no mention of the role of GEF. It needs to provide a clear description of the GEF role in this project. This oversight may be corrected by adding a paragraph or two to describe the GEF role.

The sustainability and replicability sections could be further strengthened, especially on how to involve the whole banking sector. Because most banks lack technical skills and of necessity emphasize borrowers' financial credibility, it has been difficult to get them to focus on lending for energy efficiency improvements. The project's goals to introduce such plans in China are laudable. Replication and sustainability of the practices will require commitments at all levels particularly at the highest level where the main rationale for bank involvement may have little to do with energy efficiency per se. Ways to sustain non-energy-rationale will be important in order to maintain the interest in energy efficiency.

The technical rationale for the project is based on a consultant report. It would be very useful to provide a summary of the report in an appendix to the main report, and note its key findings in a separate section in the main text. .

Specific Comments

I would like to suggest the following specific considerations to improve various sections of the main text, and Appendix 15, "Incremental Cost Analysis".

Section A. Strategy Context and Rationale

- Para (P).2. The term energy conservation is often used to denote energy efficiency improvement through behavioral changes (turning off lights when no one is present for instance). Unless, energy conservation is a term of art that is widely accepted to mean all aspects of energy efficiency in the World Bank and affiliated institutions, it may be better to use the term energy efficiency in place of energy conservation in the document.
- P. 3. Please define the word "Medium" in the title – Medium and Long Term Energy Conservation Plan. What sizes of industry are being referred to here?
- P. 3 A recent article notes that China's energy efficiency gains are already lagging behind the 4% annual goal to 2010. This should provide added rationale for implementing the proposed energy efficiency loan, and reference to this document should be included in the text..
- P.4 At several places, the document refers to official publications or some significant events. In this paragraph, reference is made to "dramatic improvements in production capacities without significant energy efficiency improvements". It is my understanding that this is not correct. I have provided a chart to World Bank staff that illustrates the gains made by industry in this regard. It is important to either cite the document that the proposal text is based on, or rephrase the sentence in the proposal to note that despite such improvements, Chinese industry lags behind its international counterparts.
- P.5 This paragraph should cite the earlier experience with ADB loans, and note the lessons learned from these loans.
- P.7-8 Experience with industrial sector energy efficiency investments suggests that companies demand higher rates of return for investments made within the company that are primarily aimed at cost reduction. This may be due to the difference in capital and operating budgets, organizational reasons, downtime required to install new energy efficient equipment, or perceived higher technical risks. This fact should be noted in the paragraph.

Section B: Project Description

- P.14 The reasons for the World Bank to work through participating financial institutions are well articulated in the document, and it is an effective approach to reduce transaction costs and also build capacity that may be used to spur more such projects elsewhere in China. A note of caution, however, is warranted in this regard. A similar ADB project was set up with the Industrial Development Bank of India (IDBI) in order to on-lend energy efficiency loans to Indian industry for modernization and expansion purposes in the late 1990s. The response was relatively modest, and industry was reluctant to borrow funds for this purpose. In addition, IDBI staff did not set up technical capability within the bank, which precluded further replication and sustainability of this effort. In part this was caused by a recession in the industrial sector in the late 1990s, but it also revealed the reluctance on part of banks to build internal technical capacity and to take on technical challenges. The key issue here is to understand the rationale for an industry to take on debt financing for technically challenging projects, and for banks to be persuaded to take on technical tasks which will require them to retrain or hire staff with technical expertise..
- The project components section is missing an explanation about the role of GEF. A paragraph or more is needed to explain its role, which is articulated in Appendix 15.
- P.18 – Please check typos associated with loan amounts.
- P.18 – Please explain the incentive for PFIs to supplement the IBRD loans. As I understand it, this will be a requirement in order for PFIs to receive the IBRD loan. A sentence to this effect should be included in the text.
- P.25-26 These paragraphs are difficult to understand. They need to be restated in plain English so that a lay reader can understand their meaning. What is “diagnostic work and assistance”? What were the challenges? Shaped by what study? Reference? Please reword the italicized title of P.26. What was requested by the PFIs?
- P.27 Please explain lending volume. Is it the total amount or per loan? What is the amount?
- P.30 – Typo – difference – different
- P.31 – How will the project assist PFIs to develop a robust pipeline of sub-projects? Has bringing together industry, banks, etc. worked before? It is a laudable goal but usually it is difficult to get stakeholders with such diverse interests to work together.

Section C. Implementation:

- P.36 – What will be the link between this project team and PFI’s top management? It is critical that top management (TM) is aware of and approves energy efficiency activities. Typically, TM will have its own reasons to pursue energy efficiency activities, and unless those reasons continue to persist in the future, the replication and sustainability of future activities will be in jeopardy. How would the project ensure that energy efficiency can fulfill the current and future TM objectives? It would be useful to articulate the current and potential reasons for TM participation at the start of the project and revisit these as part of the monitoring plan of the project.
- P.41 – Check typo. – replace “would” with “will” in the first line, and what is \$3.2 million?
- P.42 – Is there a reference to the government’s own assessment?
- Table – Critical risks and possible controversial aspects
- I would think that the risk of slow subproject pipeline is medium and not low. I understand the pipeline is already at 30%, nevertheless industry will have high hurdle rates for such loans and a better rationale should be described if a “low” risk rating is to be retained.
- A category of sustainability and replicability should be included in the table to note the steps being taken to bring about market transformation in the sector, and to assign a risk rating for these categories. This is particularly important from a GEF perspective since its main rationale is to provide seed funding for market transformation projects.

Section D. Appraisal Summary

- P.52 – The criteria used for accepting the FIRR rates is set too low. Most industrial projects demand a much higher FIRR for reasons noted in paragraphs 7-8 in the proposal and also above. The potential project participation rates should be reexamined using a higher hurdle rate and the number of potential projects where the FIRR exceeds this value should be recalculated.
- P.53 – What is the carbon price used in this calculation? Have other (non-energy savings) benefits been included in this calculation? Industry often will take on projects that produce savings beyond energy, for example, reduction in loss of material during its processing is more critical than mere energy savings. Such benefits should be factored into the assessment of the project, and in the calculation of the FIRR.
- P.54 – Please include this document or its executive summary in an appendix to the proposal.
- P.55 – Please explain what the GEF grant is designated for?
- P.58 – Please spell out “FI”.

Appendix 15: Incremental cost analysis:

- Page 74, para 2 – What will be the share of existing capital stock in 2020?
- Page 74, table – Please define “Large Enterprises”
- Page 75, para 1 – and will two-thirds come from structural change?
- Page 75, para 3 – Other important barriers include technology reliability, downtime, trust in technical recommendations, industry and bank capability to evaluate technical proposals.
- Page 76, para 2 – What is the magnitude of self financing?
- Page 77, B1 – Monitoring and evaluation will be a critical component of the role that PFIs and industry will need to play in order to ensure that energy savings are achieved as planned. This should be spelled out as a separate activity in this table. A good way to do this would be to ensure that there should be a monitoring plan prepared prior to the implementation of a project that industry borrowers should be asked to implement with verification by bank staff or third-party entities.
- Page 77, B3 – Please note the role of the top management as discussed above in P.36.
- Page 77, B4 – Please describe the business models that GEF technical assistance will demonstrate.

Annex 17: Maps

EAST ASIA AND PACIFIC: China Energy Efficiency Financing