

PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC995

Project Name	Establish M&V system for Energy Efficiency in China (P132748)
Region	EAST ASIA AND PACIFIC
Country	China
Sector(s)	Energy efficiency in Heat and Power (100%)
Theme(s)	Climate change (100%)
Lending Instrument	Specific Investment Loan
Project ID	P132748
GEF Focal Area	Climate change
Borrower(s)	International Department, Ministry of Finance
Implementing Agency	Economic Construction Department, Ministry of Finance, Economic Construction Department, Ministry of Finance
Environmental Category	C-Not Required
Date PID Prepared/ Updated	17-Jun-2013
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Concept Review Decision	Track II - The review did authorize the preparation to continue

I. Introduction and Context

Country Context

China has experienced the fastest economic growth in the world for the last three decades, with a 15-fold increase in GDP. Over the same time period, its energy consumption has more than tripled and is expected to double over the next two decades. China is now the largest energy consumer in the world, heavily relying on coal to meet 70 percent of its primary energy needs. This remarkable growth has led to twin energy challenges in China-environmental sustainability and energy security. China has many of the world's most polluted cities, and is the largest emitter of greenhouse gases (GHGs) in the world. China is also facing growing energy security concerns because of the increasing dependence on oil and gas imports.

Sectoral and Institutional Context

Government's commitment to energy efficiency: Improving energy efficiency is the most cost-

effective way to simultaneously address the twin energy challenges. The Chinese government has made energy conservation as one of the top priorities for the nation, as increasing energy efficiency produces energy savings, conserves scarce natural resources, improves local air quality, and enhances energy security. Therefore, China has embarked one of the most aggressive energy conservation campaigns in the world. The Government of China (GoC) had set a mandatory target to cut energy intensity (energy consumption per unit of GDP) by 20 percent in the 11th Five-Year Plan (2006-2010) and renewed its target of 16 percent reduction during the 12th Five-Year Plan (2011-2015), after its remarkable accomplishment of more than 60 percent reduction in energy intensity from 1980 to 2005. In addition, the GoC also made a pledge to reducing its carbon intensity by 40-45 percent from 2005 to 2020, to which energy efficiency (EE) is expected to make the largest contribution.

EE achievements during the 11th Five-Year Plan: The GoC has primarily relied on administrative measures to achieve the 20 percent energy intensity reduction target during 11th Five Year Plan (FYP). The Central government allocated mandatory targets for the 31 provinces and the nation's top 1,000 energy-consuming industrial enterprises, which account for one-third of China's total energy use. It also enforced compliance of new residential building designs with energy efficiency building codes more aggressively, and tightened energy efficiency standards for electric appliances. In addition, the government rolled out a national reward fund scheme that provides financial incentives for EE investments based on per ton of coal equivalent energy savings achieved, with additional funds from provincial governments. As a result of the aggressive EE campaign, China cut energy intensity by 19.1 percent during the 11th FYP period, and the national awareness of energy conservation soared.

EE priorities for the 12th Five-Year Plan: To accomplish the targets of reduction in energy intensity and carbon intensity for the 12th FYP, the GoC continues to use a combination of instruments with more inclination towards the use of market-based mechanisms, including: (a) regulatory and administrative measures by allocating quantitative energy saving targets to each province and 17,000 priority energy-consuming enterprises and setting a total energy consumption cap; (b) fiscal policies and incentives such as the reward fund for EE investments to both industrial enterprises and Energy Service Companies (ESCOs); and (c) market-based mechanisms, such as scale-up of ESCO industry, pilot Energy Saving Certificates trading, and pilot carbon cap and trade schemes.

Specifically, the GoC expanded the "1,000 priority industrial enterprise program" implemented in the 11th FYP to cover about 17,000 top energy-consuming enterprises which collectively account for two thirds of the nation's energy consumption. In parallel, a scaled-up fiscal reward program to provide incentives for EE investments is also put in place with increased reward from RMB 200 to 240 (US\$40) per ton of coal equivalent (tce) energy savings for Eastern China and from RMB 250 to 300 (US\$48) per tce for Mid- and Western China. Furthermore, the GoC ramped up its support for ESCOs with a number of fiscal and tax incentives, an indication that the market-based mechanism has become a key focus for the GoC in the 12th FYP.

The importance of energy saving measurement and verification (M&V): To implement all these policy instruments, the establishment of a market-based, standardized, and internationally recognized measurement and verification (M&V) system for energy savings is of fundamental importance, for the following reasons: (a) such an M&V system is vital for the government's reward fund program, as the financial incentives are provided based on energy savings achieved; (b) M&V is critical to scale up ESCO industry, as ESCOs' revenues depend on actual energy savings

achieved, and also to enhance the confidence of EE investors and financiers who are not sure that the upfront investment will be paid back by claimed energy savings; (c) independent third-party verification brings credibility and validates official statistics to confirm whether the 12th FYP targets are achieved. Currently, there is discrepancy between some of the targeted priority energy consuming enterprises and the government on the energy saving progress towards the 12th FYP targets. The M&V system will be essential to accurately measure the results of the on-going efforts; and (d) M&V is a pre-requisite for the pilot Energy Saving Certificates Trading and carbon cap and trade schemes.

The importance of market-based mechanisms to pilot Energy Saving Certificates trading. The government intends to increase the use of market-based mechanisms during the 12th FYP to achieve its targets cost effectively. Currently, reaching the 12th FYP energy intensity target is running into significant obstacles – some of the targeted priority enterprises could not meet their energy saving targets and some of the provinces fear that the total energy consumption cap puts a drag on their economic growth. Some enterprises or regions (e.g. Eastern provinces) have limited energy saving potentials, and it can be difficult and costly for them to achieve their allocated targets; while other enterprises or regions (e.g. Northeast and Western provinces) have large energy saving potentials, could exceed their allocated targets, but need extra incentives for them to do so. Since the government has allocated mandatory energy saving targets to the 17,000 priority enterprises and the energy data collection and reporting systems have been established during the 11th FYP period, the environment is relatively mature for Energy Saving Certificates Trading. Therefore, the government plans to pilot Energy Saving Certificates Trading scheme to achieve the 12th FYP target cost effectively.

Barriers to energy saving M&V in China: While considerable progress in energy efficiency has been accomplished, China still faces substantial challenges, particularly in the area of energy saving M&V. A few key issues have been identified as the following:

a) Urgent needs for standardized operational guidelines for project-level energy saving M&V. China has issued national standards/protocols for energy saving calculation, and guidelines for five major categories of the most commonly used EE technologies, including (i) boilers and kilns; (ii) energy system optimization; (iii) fuel switching (substitution of oil products); (iv) motor drives; and (v) waste heat recovery. However, these standards and protocols are not sufficiently detailed enough to provide operational guidance to the third party verifiers to conduct energy saving M&V for EE investments. For example, two commonly encountered difficult issues relate to defining boundaries, which determine the scope of energy savings to be included in the calculation; and measuring energy savings from coal, oil, and gas (verification of electricity savings is more straightforward). As a result, the lack of a standardized methodology and detailed operational guidelines to calculate energy savings have led to large discrepancy in measurement of project results in energy savings by the enterprises, the government, and even different third-party verification agencies, thus undermining the efficacy of the EE program. Therefore, there are urgent needs to develop standardized methodologies, detailed operational guidelines, templates, case studies, and best practices for typical EE measures and their applications in key industries.

b) Urgent needs for standardized methodology for enterprise-level energy saving M&V. In addition to project-level energy saving M&V for specific EE investments to allocate the financial reward to each project, China also needs a standardized methodology for energy saving M&V at the enterprise-level to determine whether the 12th FYP energy saving targets mandated for the 17,000

priority enterprises are met. The government has run into many obstacles when verifying whether the priority enterprises have met their 12th FYP targets. Enterprise-level energy savings result from not only specific EE investments (or project-level energy savings), but also more efficient energy management, decreased production, or closure of facilities. Therefore, enterprise-level energy saving M&V requires a different methodology to measure and verify energy savings from measures other than EE investments.

c) Lack of rigor in energy saving M&V. China's energy saving M&V practices are generally less rigorous compared to the most commonly used international protocol -- International Performance Measurement & Verification Protocol (IPMVP). China's current practice is to use host enterprises' energy bills to estimate and calculate energy savings and rarely installs meters and sub-meters to measure energy usages before and after EE measures. IPMVP requires actual measurement of energy consumption before the EE projects as the baseline, and after the EE projects are implemented. In addition, in North America, M&V plan needs to be developed and reviewed before the EE projects are implemented and will be used to guide the M&V practice. As a result, M&V costs often represent about 2-3 percent of the total project costs. In China, due to the much lower budget for M&V paid by the government and much shorter time for verification period, M&V is generally conducted with much less detail and rigor compared with the internationally adopted IPMVP, which incurs higher cost and requires a much longer time period to complete.

d) Lack of transparent and credible accreditation process for third-party verifiers. Under the energy saving reward program, 26 third-party verification agencies were selected and approved by the Ministry of Finance (MOF) and National Development and Reform Commission (NDRC), through the process of recommendation and assessment of their capacity and performance. However, this process was not transparent and no specific entity or institution is appointed to accredit third-party verifiers. To measure and verify the massive EE efforts, China needs a large cadre of qualified third-party verifiers, much more than the existing 26 accredited third-party verification agencies. Transparent qualification criteria and accreditation processes need to be established for both third-party verification professionals and agencies.

e) Need for capacity building of third-party verifiers. Third-party verification of energy savings is still at an infant stage in China. The technical skills of many verifiers in China are still low, compared to international standards. Even among the existing 26 third-party verification agencies, technical and managerial capacities as well as professionalism vary significantly. In addition, measurement equipment is obsolete and measurement is conducted at very preliminary level. There is an urgent need to build capacity to third-party verifiers, both those existing ones and new entrants. Finally, there are also significant training needs from ESCOs, priority enterprises, and provincial energy monitoring centers on energy saving M&V.

Challenges to the Energy Saving Certificates Trading in China. The Energy Saving Certificates Trading scheme is complex and challenging to design and implement. Such a scheme is new to China. To date, only a few countries around the world--UK, France, Italy, a few US states, and India—have adopted such a scheme, also called White Certificates Trading. Two major challenges to the Energy Saving Certificates Trading in China are energy saving M&V and penalty of non-compliance. In addition, Chinese government agencies need to reconcile and coordinate between the pilot Energy Saving Certificates Trading and the existing EE financial reward program, as well as between the pilot Energy Saving Certificates Trading and the pilot carbon cap and trade schemes.

The government requested for GEF funding to learn from international experience and benefit from timely and adequate support during the design and implementation of such schemes.

Relationship to CAS

The proposed project is fully consistent with the Country Partnership Strategy (CPS) FY2013-16 for China, ‘supporting greener growth, in particular, shifting to a sustainable energy path’. The Project also contributes to China’s efforts to improve energy efficiency and address climate change during the 12th FYP. It is consistent with the latest National Communication by the Government of China. In addition, the proposed project would support the World Bank Group’s corporate commitment to increasing energy efficiency lending, and addressing climate change.

II. Proposed Development Objective(s)

Proposed Global Environmental Objective(s) (From PCN)

The objective of the proposed project is to establish a measurement & verification system for energy savings to prepare for market-based mechanisms, thereby, contributing to the GoC’s ambitious energy conservation programs.

Key Results (From PCN)

Achievement of the project development objective will be assessed with the following high-level outcome indicator: a measurement & verification system for energy savings established.

The project-level intermediate output indicators are: (a) consistent, operational, and standardized energy saving M&V methodologies, guidelines, and protocols developed; (b) a transparent and credible accreditation process for third-party verifiers established; (c) capacity of stakeholders including third-party verifiers, ESCOs, and enterprises built; (d) market-based trading schemes studied and designed; and (e) avoided CO2 emissions.

III. Preliminary Description

Concept Description

The proposed project is a stand-alone GEF project. The project cost is US\$17.8 million from GEF grant. The counterpart funds of US\$104 million from the governments, enterprises, and financial institutions will be complementary to the project. The GEF project design was approved by the Bank management, Chinese government, and the GEF Council in June 2012.

The proposed project would be comprised of the following three components: (a) establishing a measurement & verification system for energy savings; (b) designing and piloting market-based Energy Saving Certificates trading scheme; and (c) supporting project management and coordination. Component 1 will provide a solid foundation for Component 2.

Component 1 is an immediate and urgent task. Such an energy saving M&V system is needed to bring credibility and accountability to the government’s EE reward funds and achieving the energy intensity reduction target for the 12th FYP. It is required regardless whether the proposed Energy Saving Certificates Trading moves forward or not. Energy savings M&V is a pre-requisite for future potential Energy Savings Certificates Trading and/or carbon cap and trade. International experience demonstrates that it would take a long time to establish an M&V system, before the trading schemes are launched. Therefore, it is essential to establish the energy savings M&V system now to get ready for future trading schemes.

Component 2 needs to take a flexible approach and adjust the scope along the way during project implementation, as the government has not formally confirmed moving forward with the Energy Saving Certificates Trading. The National Development and Reform Commission (NDRC) Environmental Protection and Resource Conservation Department plans to pilot Energy Saving Certificates Trading as a market-based mechanism to achieve the 12th FYP energy intensity reduction target cost effectively. In the meantime, the NDRC Climate Change Department is piloting carbon cap and trade scheme in five cities and two provinces (Beijing, Tianjin, Shanghai, Chongqing, Shenzhen, Guangdong, and Hubei) to cost effectively achieve the 12th FYP carbon intensity reduction target. The priority and coordination of the proposed Energy Saving Certificates trading and carbon cap and trade are under discussion at the highest level of the government.

Component 1. Establishing measurement & verification system for energy savings (indicative cost estimate: US\$12 million GEF grant): This component will support the design and establishment of an energy saving M&V system in China through the following four sub-components: (a) developing more detailed methodologies, operational guidelines, templates, and case studies for energy saving M&V, both at the project-level and enterprise-level; (b) establishing a transparent and credible accreditation system for third-party verifiers and an institutional mechanism for energy savings M&V; (c) building capacity of third-party verifiers, ESCOs, enterprises, provincial energy monitoring centers, and other key stakeholders; and (d) supporting implementation of energy saving M&V in selected priority enterprises, including installation of the online monitoring systems and M&V equipment. This component will be closely coordinated with measurement, reporting, and verification (MRV) for the proposed carbon cap and trade under the Partnership for Market Readiness (PMR) initiative.

Component 2. Studying and designing market-based trading schemes (indicative cost estimate: US \$5 million GEF grant): Fully recognizing the uncertainty over Energy Saving Certificates trading, this component will provide analytical work on market-based trading scheme, including the design of the Energy Saving Certificates trading and other relevant market-based trading schemes, coordination and integration of Energy Saving Certificates trading with carbon cap and trade. The market-based trading schemes under this component could include Energy Saving Certificates trading system, carbon cap and trade system, or both. This component will capitalize on international experience to support the design of Energy Saving Certificates trading, including obliged parties, penalty for non-compliance, trading platform, pricing mechanisms, trading rules, regulatory and registry entities, and coordination with the existing financial reward program and the ongoing pilot carbon cap and trade. This component will focus on analytical work and design, which provides financing and technical inputs to guide government's decision making process for the market-based trading schemes. Once the government's decision is made, the project will move forward to support its implementation.

Component 3. Supporting project management and coordination (indicative cost estimate: US\$0.8 million GEF grant): This component will support project management and coordination activities of the Project Management Office (PMO). The PMO has been established under the Economic Construction Department of the Ministry of Finance (MOF). Currently, MOF is responsible for fiscal incentives such as the EE reward fund, and energy saving M&V is required to be eligible to receive the EE rewards. NDRC is responsible for achieving the 12th FYP energy intensity targets and managing the 17,000 priority enterprises program. A close collaboration between MOF and NDRC is essential to ensure that the proposed project will be effective and successful. It was agreed that MOF and NDRC will both be represented in the Project Steering Committee and the PMO, and

assign dedicated staff working on this project. The following implementation arrangement was proposed and is waiting for confirmation from the GoC--MOF will lead the implementation of Component 1, NDRC will lead the implementation of Component 2, and the PMO under the MOF will provide overall coordination of project implementation.

IV. Safeguard Policies that might apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01	x		
Natural Habitats OP/BP 4.04		x	
Forests OP/BP 4.36		x	
Pest Management OP 4.09		x	
Physical Cultural Resources OP/BP 4.11		x	
Indigenous Peoples OP/BP 4.10		x	
Involuntary Resettlement OP/BP 4.12		x	
Safety of Dams OP/BP 4.37		x	
Projects on International Waterways OP/BP 7.50		x	
Projects in Disputed Areas OP/BP 7.60		x	

V. Financing (in USD Million)

Total Project Cost:	118.00	Total Bank Financing:	0.00
Total Cofinancing:		Financing Gap:	0.00
Financing Source			Amount
BORROWER/RECIPIENT			100.00
Global Environment Facility (GEF)			18.00
Total			118.00

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