

**PROJECT INFORMATION DOCUMENT (PID)
APPRAISAL STAGE**

Report No.: PIDA85195

Project Name	Developing Market-based Energy Efficiency Program in China (P132748)
Region	EAST ASIA AND PACIFIC
Country	China
Lending Instrument	Investment Project Financing
Project ID	P132748
GEF Focal Area	Climate change
Borrower(s)	People's Republic of China
Implementing Agency	Huaxia Bank, Hebei PMO, China National Energy Conservation Center
Environmental Category	B-Partial Assessment
Date PID Prepared/Updated	22-Sep-2016
Date PID Approved/Disclosed	08-Apr-2015
Estimated Date of Appraisal Completion	30-Sep-2016
Estimated Date of Board Approval	21-Oct-2016
Appraisal Review Decision (from Decision Note)	The project processing steps and proposed timeline have been agreed at the decision review meeting. Project appraisal is planned to start on September 26, 2016. The Bank will negotiate the project after receiving the GEF Council approval and GEF CEO endorsement. This GEF project will be synchronized to start its support to the two PforR Programs as soon as possible.

I. Project Context

Country Context

Over the last 35 years since the start of the open door policy, China has experienced the fastest economic growth in the world and its energy sector has developed accordingly. Energy consumption increased more than 6-fold to fuel an economy that increased 22-fold and to satisfy the needs of an urban population that nearly quadrupled, reaching 54 percent of China's population in 2013. China is now the largest energy consumer in the world, heavily relying on coal to meet two-thirds of its primary energy needs. Over the next two decades, energy consumption is expected to double. This remarkable growth in energy consumption has led to twin 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 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 on one of the most aggressive energy conservation campaigns in the world. The Government of China (GoC) 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). Between 1980 and 2005, China achieved the remarkable accomplishment of reducing energy intensity by more than 60 percent. In the 13th FYP (2016-2020), the GoC plans to implement a total energy consumption cap, in addition to a 15 percent reduction in energy intensity. Finally, the GoC made a pledge to reduce its carbon intensity by 40-45 percent from 2005 to 2020, and by 60-65 percent from 2005 to 2030, and has announced that it expects the country's carbon emissions to peak by 2030. Energy efficiency (EE) is expected to make the single largest contribution to these emission reduction targets.

Government's commitment to climate change: At the Paris COP 21 meeting, the GoC made a pledge, as part of its Intended Nationally Determined Contributions (INDC), to reducing its carbon intensity by 40-45 percent from 2005 to 2020 and by 60-65 percent from 2005 to 2030, and has announced that it expects China's carbon emissions to peak by 2030. The GoC is also piloting a carbon Emission Trading Scheme in five cities and two provinces, and plans to roll out nationwide in 2017. Energy efficiency (EE) is expected to make the single largest contribution to these emission reduction targets.

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 has also more aggressively enforced compliance with new residential building designs and energy efficiency building codes, and has tightened energy efficiency standards for electrical appliances. In addition, the government rolled out a national reward fund scheme that provides financial incentives for EE investments based on energy savings (per ton of coal equivalent), with additional funds provided by provincial governments. As a result of the aggressive EE campaign, China cut energy intensity by 19.1 percent during the 11th FYP period, and also importantly raised national awareness of energy conservation.

EE achievements during the 12th Five-Year Plan: To accomplish its energy intensity and carbon intensity reduction targets for the 12th FYP, the GoC made increasing use of market-based regulatory and fiscal instruments, including: (a) allocating quantitative energy saving targets to each province and 17,000 priority energy-consuming enterprises and setting a voluntary total energy consumption cap; (b) policy incentives such as the reward fund for EE investments to both industrial enterprises and Energy Service Companies (ESCOs); and (c) other market-based mechanisms, such as scale-up of the ESCO industry, and pilot carbon cap and trade schemes.

Priority Enterprises Program: Specifically, during the 12th FYP the GoC expanded the 1,000 priority industrial enterprise program implemented in the 11th FYP to 17,000 top energy-

consuming enterprises, which collectively account for about two-thirds of the nation's energy consumption. The National Development and Reform Commission (NDRC) Environmental Protection and Resource Conservation Department is responsible for implementing the EE targets, and managing the energy conservation program in the 17,000 priority enterprises.

EE Fiscal Incentives: In parallel, a scaled-up fiscal reward program to provide incentives for energy savings was put in place by increasing the reward from RMB 200 to 240 (US\$40) per ton of coal equivalent (tce) in Eastern China and from RMB 250 to 300 (US\$48) per tce for Middle and Western China. Furthermore, the GoC ramped up its support for ESCOs with a number of fiscal and tax incentives, indicating the intention to rely more on market-based mechanisms. By the end of the 12th FYP (2015), the EE fiscal reward fund was discontinued for new EE projects.

Prospects for the 13th Five-Year Plan: President Xi Jinping has recently called for an energy revolution in China, including revolutions for energy consumption, energy supply, energy institutions, and technology innovation as well as international cooperation. Following this principle, the 13th FYP (2016-2020) for the first time adopts a mandatory total energy consumption cap from 4.3 billion tons of coal equivalent (tce) in 2015 to 5 billion tce by 2020, in addition to a 15 percent energy intensity reduction target. The government also intends to increase the use of market-based mechanisms. The 13th FYP is a critical period for achieving the country's aggressive carbon intensity reduction target for 2020. Through this project, the government has requested assistance from the GEF to help develop and implement the energy efficiency and carbon reduction goals of the 13th FYP.

Energy Consumption Certificates Trading: To accomplish the total energy consumption cap, the government is contemplating the use of an Energy Consumption Certificates Trading Program. Under this scheme, enterprises or regions (eg, Eastern provinces) with limited scope to achieve the energy consumption cap would be able to trade Certificates with other enterprises or regions (eg, Northeast and Western provinces) that have greater potential for energy savings or energy consumption growth. Enabling enterprises or regions to trade with those that have surplus Certificates would help achieve China's energy consumption cap target in a more cost-effective way. However, Energy Consumption Certificates Trading is complex and challenging to design and implement, and is new to China. There are three major challenges to the trading scheme in China: (a) the lack of energy saving measurement and verification (M&V) protocols and implementation capacity; (b) the need for penalties for non-compliance; and (c) the need to reconcile and coordinate between Certificate Trading and China's carbon Emission Trading Scheme (ETS), which is under pilot in 5 cities and 2 provinces and that is planned to be rolled out nationwide in 2017.

World Bank Group engagement in energy efficiency in China's over the past 20 years: The Bank's long-term engagement with China on energy efficiency, moving from pilots to mainstreaming actions, have resulted in transformational impacts. Over the past two decades, the Bank has been working with China to help move towards more market-based approaches for energy conservation. Support from the Global Environment Facility (GEF) has been instrumental in World Bank assistance to China for energy efficiency, and has included support in the following areas: (a) The Energy Conservation Project (1998) helped introduce the Energy Service Company (at the time in China called energy management companies) concept to China, whereby for-profit investments in energy efficiency are made by third-party companies, including the support of the country's first three ESCO companies; (b) When the ESCO industry started to grow, the Energy Conservation II project provided partial risk guarantees to help ESCOs access financing and promoted the establishment of an ESCO Association. From this initial start, China's ESCO

industry has grown to over 5,000 companies, with nearly US\$10 billion in energy performance contracts in 2012; and (c) Having successfully established the ESCO industry, the next phase of support was to mainstream energy efficiency within China's banking sector by establishing EE credit lines, providing training to the banking sector, and introducing alternative financing mechanisms. The China Energy Efficiency Financing (CHEEF) program, working with Huaxia Bank Co. Limited (HXB), EXIM Bank, and Minsheng Bank, has financed US\$2.6 billion of EE and renewable energy (RE) investments in China, of which US\$350 million in financing has been provided by IBRD and the remaining funding from the participating banks and industrial enterprises. The GEF Provincial Energy Efficiency Scale-Up Project has supported market-based energy efficiency programs at the provincial level (in Shandong, Shanxi, and Jiangxi), including the introduction of an innovative and successful energy efficiency leasing model, and building capacity for expanding the ESCO industry and refining energy savings data upon which the overall energy efficiency industry depends.

The World Bank is financing two Program-for-Results operations to support the GoC's Air Pollution Prevention and Control Action Plan: China is experiencing severe air pollution. The Beijing-Tianjin-Hebei region (hereafter referred to as Jing-Jin-Ji, or JJJ Region) has been experiencing severe air pollution in recent years, with annual average fine particulate matter (PM2.5) concentrations of 93 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) in 2014, far exceeding the national PM2.5 standard of 35 $\mu\text{g}/\text{m}^3$ and the World Health Organization (WHO) PM2.5 standard of 10 $\mu\text{g}/\text{m}^3$. The GoC has declared a war on air pollution and issued the Air Pollution Prevention and Control Action Plan (APPCAP) in 2013, which has nationwide coverage and specifically mandates the JJJ region to reduce its annual average PM2.5 concentration by 25 percent between 2012 and 2017. An extension to the APPCAP that will further reduce PM2.5 concentrations in the JJJ Region beyond 2017 was announced on December 30, 2015, and aims to reduce PM2.5 concentrations by around 40 percent from the 2013 level by 2020, reaching around 64 $\mu\text{g}/\text{m}^3$. The implementation regulations of the APPCAP in the JJJ Region also set a mandatory target to reduce coal consumption by 83 million tons from 2012 to 2017. To support the APPCAP, the World Bank is financing two Program-for-Results (PforR) operations, providing \$500 million IBRD funds for each program: (a) the Innovative Financing for Air Pollution Control in Jing-Jin-Ji Program (JJJ PforR Program); and (b) the Hebei Pollution Prevention and Control Program (Hebei PforR Program). Both of these Programs use the PforR lending instrument, which requires implementing agencies to hire independent and credible third parties to verify agreed-upon results prior to World Bank disbursement of funds.

Innovative Financing for Air Pollution Control in Jing-Jin-Ji Program: This is the first PforR operation in China, and was approved by the World Bank Board in March 2016. The JJJ PforR Program aims to reduce air pollutants and carbon emissions through energy efficiency and clean energy, with a focus on the Jing-Jin-Ji and neighboring regions. Total investment of the Program is expected to be at least \$1.0 billion, of which \$500 million would come from IBRD loans and \$500 million from HXB loans. The Program intends to achieve results in three areas: (a) coal reduction from eligible energy efficiency and renewable subprojects; (b) reduced air pollution emissions through pollution abatement measures; and (c) strengthened institutional capacity of HXB. Six disbursement-linked indicators (DLIs) have been agreed to measure these results areas. The HXB is responsible for verification of the achievements of the DLIs through independent verification agencies, based on the agreed verification protocol.

The Hebei Pollution Prevention and Control Program: The Hebei PforR Program aims to reduce the emissions of air pollutants from key sectors. The total Program expenditure is expected to be at least \$650 million, of which \$500 million would come from IBRD loans and \$150 million from the Hebei government. The Program intends to achieve results in four areas: (a) comprehensive control of industrial enterprises and the reduction of emissions of air pollutants from key industrial sectors; (b) area source air pollution controls (such as from agricultural and open burning); (c) prevention and control of emissions from transport sources; and (d) establishment of monitoring and warning systems, and the use of advanced planning tools. Seven DLIs have been identified to measure the results. The Hebei Government is responsible for verification of the achievement of the DLIs through independent verification agencies, based on the agreed verification protocol. The Hebei PforR Program was approved by the World Bank Board in June 2016.

Value added of GEF funds: The GEF funds are sought to support the implementation of the above two PforR Programs through capacity building and technical assistance to implementing agencies, proactive outreach, and independent third-party verification of the results. GEF funds are critical to ensure successful implementation of the PforR Programs and result verification

Energy savings measurement and verification is essential for market-based mechanisms: The establishment of a market-based, standardized, and internationally recognized measurement and verification system for energy savings is fundamental to achieve the targets in the 13th FYP and the PforR Programs. Such a system underpins any envisioned market-based energy savings mechanism, for the following reasons: (a) Independent third-party verification provides credibility, can validate official statistics, and can confirm whether the 13th FYP targets are achieved; (b) A credible M&V system is a pre-requisite for the pilot Energy Consumption Certificates Trading and China's ETS, since the bulk of carbon emission reductions from both the Certificate Trading and ETS would come from energy efficiency; (c) M&V is required for the Bank-financed PforR operations and any other results-based financing program; and (d) M&V is critical for the expansion of the ESCO industry, since ESCO revenues depend on actual energy savings achieved, and also to enhance the confidence of EE investors and financiers who are uncertain if upfront investments will be paid back through claimed energy savings.

Under the government's energy savings reward fund program implemented in the 12th FYP, MOF and NDRC accredited 26 third-party verifiers and issued a number of energy savings M&V guidelines and methodologies to verify eligible projects. In addition, the ongoing CHEEF project has been supporting pilot online M&V systems for energy consumption in selected sectors and provinces, and NDRC plans to roll out this online energy monitoring platform program to all 17,000 priority enterprises nationwide.

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 are the following:

Standardized operational guidelines and methodologies for energy saving M&V are needed at both the project and enterprise level. China has issued national standards/protocols for energy saving calculation, and guidelines for the most commonly used EE technologies. 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 issues are: (1) defining the scope or boundary for the energy savings to be included in the calculation; and (2) measuring energy savings from coal, oil, and gas consumption, compared to

measuring only electricity savings which is more straightforward. In addition to project-level energy saving M&V for specific EE investments, China also needs standardized methodologies for energy saving M&V at the enterprise-level to determine whether its mandated energy saving targets are met and to lay the ground work for the future potential EE trading between enterprises. A lack of standardized methodologies and detailed operational guidelines to calculate energy savings at both project and enterprise levels have led to large discrepancies in the measurement of project results by enterprises, the government, and even different third-party verification agencies, thus undermining the credibility and efficacy of the EE program. Therefore, there is an urgent need to develop standardized methodologies, detailed operational guidelines, templates, case studies, and best practices for typical EE measures and their application at the project and enterprise level.

Lack of a transparent and credible accreditation process and institutional framework, and limited capacity of third-party verifiers. To measure and verify the China's massive EE efforts, a large cadre of qualified third-party verifiers, much more than the existing 26 accredited third-party verification agencies, is needed. Transparent qualification criteria, accreditation processes, and a credible institutional framework needs to be established for both third-party verification professionals and agencies. In addition, 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. There is an urgent need to build the capacity of third-party verifiers, both of existing verifiers and new entrants. There are also significant training needs from ESCOs, enterprises, and provincial energy monitoring centers for energy saving M&V. The government has therefore requested the support of the GEF to learn from international experience to develop and implement market-based priority EE and coal cap programs for the 13th FYP, and to improve the energy savings M&V system, both of which are essential for achieving the government's ambitious EE programs.

Therefore, the government requested GEF funding to learn from international experience and benefit from timely and adequate support to develop and implement market-based priority EE and coal cap programs for the 13th FYP, and to improve the energy savings M&V system, contributing to the government's ambitious EE programs.

II. Proposed Development Objectives

The objective of the project is to support development and implementation of China's priority energy efficiency and environment programs, with a focus on improving results measurement and verification system and developing market-based mechanisms.

III. Project Description

Component Name

Component 1. Supporting Market-based Priority Energy Efficiency and Coal Cap Control Programs

Comments (optional)

Component Name

Component 2. Supporting Results-based Green Energy Financing

Comments (optional)

Component Name

Component 3. Supporting the Results-based Environmental Program in Hebei
Comments (optional)

IV. Financing (in USD Million)

Total Project Cost:	0.00	Total Bank Financing:	0.00
Financing Gap:	-17.80		
For Loans/Credits/Others			Amount
Borrower			0.00
Global Environment Facility (GEF)			17.80
Total			17.80

V. Implementation

A Project Steering Committee, comprising the Environmental Protection and Resource Conservation Department of the NDRC, the International Cooperation Department of the Ministry of Finance (MOF), Hebei Development and Reform Commission (HBDRC), and Huaxia Bank (HXB), will be set up to provide overall strategic and policy guidance and coordinate between various government agencies to implement the project activities. NDRC is responsible for sector policies, in particular, for achieving the EE targets under the 13th FYP, managing the 17,000 priority enterprises program, and implementing the envisioned energy consumption trading scheme, and will therefore lead the implementation of Component 1. HXB is responsible for implementing the JJJ PforR Program and Component 2. Hebei DRC will lead the implementation of the Hebei PforR Program and Component 3. It is agreed that MOF, NDRC, HBDRC, and HXB will coordinate closely on this project.

For Component 1, a PMO has been established under the Environmental Protection and Resource Conservation Department of the NDRC. The PMO will be responsible for overall implementation, coordination, monitoring and reporting during project implementation. NDRC will assign a Director to head the PMO as Director, and the PMO will include one full-time Executive Director, two to three project managers, one procurement specialist, and one financial specialist. A technical expert group will also be formed under the PMO.

HXB, particularly its Green Finance Center, will lead the implementation of Component 2. HXB will assign dedicated staff to manage the GEF grant, supported by technical experts on an as-needed basis. The NDRC PMO and HXB staff have prior experience in managing GEF grants under the CHEEF project, are familiar with the Bank procurement, financial management, and safeguard guidelines and procedures, and have demonstrated satisfactory performance under the CHEEF project.

HBDRC will lead the implementation and coordination of Component 3 in Hebei. They are in the process of establishing the Hebei PMO (HBPMO). The Bank team requested that HBDRC assign a Director to head the PMO as Director, and the PMO will include one full-time Executive Director, two to three project managers, one procurement specialist and one financial specialist familiar with the Bank's fiduciary guidelines and procedures. A technical expert group will also be formed under the HBPMO.

The NDRC PMO and HXB have prepared a GEF Project Implementation Plan (PIP), with a detailed work plan for each activity and task, outputs, budgets, schedule, PMO structure, and plans for supervision and quality control, as well as the first 18-month procurement plan.

VI. Safeguard Policies (including public consultation)

Safeguard Policies Triggered by the Project	Yes	No
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

Comments (optional)

VII. Contact point

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