

**CEO ENDORSEMENT STAGE
DRAFT PROJECT APPRAISAL DOCUMENT**

ON A

PROPOSED GRANT FROM THE
GLOBAL ENVIRONMENT FACILITY TRUST FUND
IN THE AMOUNT OF US\$ 17.8 MILLION

TO THE

PEOPLE'S REPUBLIC OF CHINA

FOR A

DEVELOPING MARKET-BASED ENERGY
EFFICIENCY PROGRAM IN CHINA

January 29, 2015

World Bank GEF Coordination Program

ABBREVIATIONS AND ACRONYMS

CPS	Country Partnership Strategy	Mtce	Million tons of coal equivalent
DA	Designated Account	NA	Not Applicable
EE	Energy Efficiency	NCB	National Competitive Bidding
ESCO	Energy service company	NDRC	National Development and Reform Commission
ETS	Emission trading scheme	ORAF	Operational Risk Assessment Framework
FM	Financial management	O&M	Operation and Maintenance
FMM	Financial management manual	PAD	Project Appraisal Document
FYP	Five-Year Plan	PBP	Pay Back Period
GDP	Gross Domestic Product	PDO	Project Development Objective
GEF	Global Environment Facility	PIP	Project Implementation Plan
GHG	Greenhouse Gas	PMO	Project Management Office
GOC	The Government of China	PP	Procurement plan
GPN	General Procurement Notice	QBS	Quality-Based Selection
ICB	International Competitive Bidding	QCBS	Quality- and Cost-Based Selection
IFR	Interim financial reports	RE	Renewable energy
IPMVP	International Performance Measurement & Verification Protocol	RMB	Renminbi (Chinese Yuan)
MOF	Ministry of Finance	TA	Technical Assistance
M&V	Measurement and verification	tce	Ton of coal equivalent
MRV	Measurement, reporting, and verification	WB	World Bank

CHINA
DEVELOPING MARKET-BASED ENERGY EFFICIENCY PROGRAM
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DRAFT PAD DATA SHEET*China**Developing Market-based Energy Efficiency Program (P132748)***DRAFT PROJECT APPRAISAL DOCUMENT***EAST ASIA AND PACIFIC**EASCS*Report No.: **PADXXX**

Project Financing Data(in USD Million)										
<input type="checkbox"/>	Loan	<input checked="" type="checkbox"/>	Grant	<input type="checkbox"/>						Other
<input type="checkbox"/>	Credit	<input type="checkbox"/>	Guarantee							
Total Project Cost:			17.80			Total Bank Financing:			17.80	
Total Cofinancing:			0.00			Financing Gap:			0.00	
Financing Source				Amount						
BORROWER/RECIPIENT				0						
Global Environment Facility (GEF)				17.8						
Total				17.8						
Expected Disbursements (in USD Million)										
Fiscal Year	2016	2017	2018	2019	2020					
Annual	1.0	2.5	4.0	5.5	4.8					
Cumulative	1.0	3.5	7.5	13.0	17.8					
Proposed Global Environmental Objective(s)										
The objective of the project is to support development and implementation of China's priority energy conservation programs, with a focus on improving energy savings measurement and verification system and developing market-based mechanisms.										
Components										
Component Name					Cost (USD Millions)					
Component 1. Improving Market-based Fiscal Incentives for Energy Savings					10.0					
Component 2. Supporting Development and Implementation of Priority Energy Efficiency Programs					7.0					
Component 3. Supporting Project Management and Coordination					0.8					

Total		17.8		
Institutional Data				
Sector Board				
Energy and Mining				
Sectors / Climate Change				
Sector (Maximum 5 and total % must equal 100)				
Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Energy and mining	General energy sector	70		100
Industry and trade	General industry and trade sector	30		100
Total		100		
<input type="checkbox"/> I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.				
Themes				
Theme (Maximum 5 and total % must equal 100)				
Major theme	Theme	%		
Environment and natural resources management	Climate change	100		
Total		100		
Compliance				
Policy				
Does the project depart from the CAS in content or in other significant respects?			Yes []	No [X]
Does the project require any waivers of Bank policies?			Yes []	No [X]
Have these been approved by Bank management?			Yes []	No [X]
Is approval for any policy waiver sought from the Board?			Yes []	No [X]
Does the project meet the Regional criteria for readiness for implementation?			Yes [X]	No []
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

STRATEGIC CONTEXT

A. Country Context

1. China has experienced the fastest economic growth in the world for the last three decades, and decoupled energy consumption from economic growth, with a five-fold increase in energy consumption to fuel an economy that increased 18-fold and satisfy the need of an urban population that more than doubled reaching 45 percent of the population. China is now the largest energy consumer in the world, heavily relying on coal to meet 70 percent of its primary energy needs. Over the next two decades, energy consumption is expected to double. 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.

B. Sectoral and Institutional Context

2. **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. Finally, 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 single largest contribution.

3. **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.

4. **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 voluntary 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.

5. **Priority Enterprises Program:** 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. 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.

6. **EE Fiscal Incentives:** 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. By mid-2014, the EE fiscal reward fund is closed for new EE projects. A new fiscal incentive program started to provide 400-600 million RMB per year for three years to award each of the pilot Energy Conservation and Emission Reduction cities if they can reach higher targets of energy intensity reduction, carbon intensity reduction, and emission reduction than those required by the 12th FYP. To date, 30 pilot cities have been approved under this program. The Ministry of Finance (MOF) Economic and Construction Department is charge of the EE fiscal incentives.

7. **Ways Forward for the 13th Five-Year Plan.** Chinese President Xi Jinping has recently called for “energy revolution” for China’s energy sector, including revolutions for energy consumption, energy supply, institutional reforms, and technology innovation as well as international cooperation. Following this principle, it is widely expected that the upcoming 13th FYP (2016-2020) will adopt mandatory total energy consumption cap, in addition to the energy intensity reduction target, and increase the use of market-based mechanisms. The 13th FYP period will be the crucial last five years to achieve the carbon intensity reduction target by 2020. The government has requested for assistance from this project with GEF funding to help develop and implement EE priorities for the 13th FYP.

8. **World Bank Group’s engagement in China’s energy efficiency over the past 20 years:** World Bank’s long-term engagements with the government, moving from pilots to mainstreaming actions, have resulted in transformational impacts. Over the past two decades, the World Bank has been working with China to help China move to more market-based approaches for energy conservation under the three phases of World Bank/GEF-supported projects: (a) the Energy Conservation Project introduced the ESCO concept to China by establishing the first three ESCOs; (b) the Energy Conservation II Project provided partial risk guarantees to help ESCOs access to financing and established an ESCO Association, as the ESCO industry started to grow; and (c) the China Energy Efficiency Financing (CHEEF) program is now supporting the mainstreaming of energy efficiency lending in the Chinese banking sector through EE credit lines. As a result, the ESCO industry in China has grown to nearly 5,000 companies with nearly \$10 billion in energy performance contracts in 2012. The success of this long-term sector

engagement is largely thanks to the interventions at the right timing when the Chinese government was searching for market-based solutions, strong government commitment and support, and continuity of the teams both on the government side and the Bank side. Furthermore, the International Finance Corporation (IFC) has also been implementing the China Utility-Based Energy Efficiency Project (CHUEE) project that intends to promote EE improvements with commercial bank financing backed by a partial risk guarantee facility.

9. Market-based mechanism: Energy Saving Certificates Trading. The Third Plenary Session of the 18th Central Commission of the Communist Party of China decided that the market will play a decisive role, and listed Energy Savings Certificates Trading as one of the top reform priorities. Currently, reaching the 12th FYP energy intensity target is running into significant obstacles – some of the provinces and targeted priority enterprises could not meet their energy saving targets. Looking ahead, the 13th FYP is likely to mandate total energy consumption cap, and some of the provinces fear that this cap would put a lid 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 each province and priority enterprises, and the energy data collection and reporting systems have been established during the 11th and 12th FYP period, the condition is relatively mature for Energy Saving Certificates Trading. Therefore the Energy Saving Certificates Trading scheme can help the government achieve its energy efficiency targets cost effectively.

10. *Coordination between Energy Saving Certificates Trading and Carbon Cap and Trade:* Currently, the government is piloting Carbon Emission Trading Schemes (ETS) in five cities and two provinces, and the top-level design of the pilot Energy Saving Certificates Trading scheme is still under consideration by the highest level of decision makers in China. Both the World Bank team and the government recognized the importance to reconcile and coordinate between the envisioned Energy Saving Certificates Trading and the ongoing pilot carbon cap and trade schemes. To this end, the World Bank team has conducted (a) a study on international experience of coordination between the EE trading, Renewable Energy (RE) trading, and ETS (see Section C for details); and (b) an ongoing Chinese study on a roadmap of the coordination of EE, RE, and ETS trading schemes, which is expected to produce a policy note on coordination of the trading schemes in China. In addition, the Bank team has also undertaken extensive consultations with the NDRC Environmental Protection and Resource Conservation Department, MOF, NDRC Climate Change Department, who is in charge of the ongoing pilot carbon and trade scheme, State Council Development and Reform Center, and other relevant stakeholders. The studies demonstrated that Energy Saving Certificates Trading scheme could co-exist with ETS in parallel, but the two pilot trading schemes should be in segregated geographic markets to avoid conflicts. Finally, this project has also been closely coordinated with the Partnership for Market Transformation initiative supporting the design of China's ETS system.

11. *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 measurement and verification (M&V) and penalty of non-compliance. In addition, as mentioned earlier, Chinese government agencies need to reconcile and coordinate between the pilot Energy Saving Certificates Trading and the ongoing pilot carbon cap and trade schemes.

12. Energy savings measurement and verification: 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 12th and 13th FYP EE targets and underpins any envisioned market-based mechanisms, for the following reasons: (a) independent third-party verification brings credibility and validates official statistics to confirm whether the 12th and 13th 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; (b) such an M&V system is a pre-requisite for the pilot Energy Saving Certificates Trading and carbon cap and trade schemes. Since the bulk of carbon emission reductions would come from energy efficiency in China, the sound energy savings M&V system will not only be essential for the EE trading, but also provide solid foundations for the ETS; (c) M&V is vital for the government's fiscal incentive programs; (d) M&V is useful to any envisioned output-based EE financing mechanisms; and (e) 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.

13. To receive the energy savings reward, eligible projects must have their energy savings verified by an independent third party verifier. To date, MOF and NDRC have accredited 26 third-party verifiers under the energy saving reward program. In addition, NDRC plans to establish online M&V systems for energy consumption in the 17,000 priority enterprises.

14. **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 and methodologies for energy saving M&V at both project and enterprise levels.*** 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 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, while verification of electricity savings 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 the 12th FYP energy saving targets mandated for the 17,000 priority enterprises 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 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 at project-level and for key energy-intensive sectors at enterprise-level .

- b) ***Lack of transparent and credible accreditation process and institutional framework and limited capacity for 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, accreditation processes, and credible institutional framework need to be established for both third-party verification professionals and agencies. In addition, 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 capacity to third-party verifiers, both those existing ones and new entrants. Finally, there are also significant training needs from ESCOs, enterprises, and provincial energy monitoring centers on energy saving M&V.

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

C. Higher Level Objectives to which the Project Contributes

16. The proposed project is fully consistent with the recently approved Country Partnership Strategy (CPS) FY2013–2016 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 and 13th 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. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

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

B. Project Beneficiaries

18. Project beneficiaries include (a) government agencies at the national level, particularly Ministry of Finance (MOF) and National Development and Reform Commission (NDRC), and at the local level, particularly the municipal governments under the pilot Energy Conservation and Emission Reduction cities program; (b) the key energy-consuming industrial enterprises; (c)

Energy Service Companies (ESCOs), equipment manufacturers and related service suppliers; (d) third-party energy saving verification agencies and professionals; (e) research institutions and think tanks; (f) all economic agents engaged in the EE supply and delivery chain; (g) the Chinese population who ultimately benefits from less polluting generation of electricity; and (h) the global community who benefits from avoided greenhouse gas emissions, which contributes to global climate change mitigation.

C. PDO Level Results Indicators

19. The achievement of the Project Development Objective would be measured through the following high-level outcome indicators: (a) energy savings measurement and verification system improved; and (b) market-based mechanisms for energy savings designed.

20. The project-level intermediate output indicators are:

- (a) Innovative EE fiscal incentives designed
- (b) Implementation capacity improved in selected pilot cities
- (c) Energy savings M&V methodologies and guidelines developed
- (d) Capacity of stakeholders built for MRV system
- (e) Priority EE policies and programs supporting 13th FYP designed
- (f) Market-based mechanism designed
- (g) Capacity of stakeholders built for market-based mechanisms
- (h) Energy savings achieved
- (i) Avoided CO₂ emissions

III. PROJECT DESCRIPTION

21. The proposed project would be comprised of the following three components: (a) improving market-based fiscal incentives for energy savings; (b) supporting development and implementation of priority energy efficiency programs; and (c) supporting project management and coordination.

22. The PMO has prepared a GEF Project Implementation Plan (PIP), with a detailed work plan for each activity and task, outputs, budget, schedule, PMO structure, and plans for supervision and quality control, satisfactory to the Bank; as well as the first year procurement plan.

23. It should be noted that the tasks outlined below are those urgent to be implemented during project preparation and the initial-year work program, agreed between MOF, NDRC, and the Bank. Other tasks will be detailed and confirmed during the annual review of the work program to be carried during the supervision of the project to leave flexibility during project implementation, particularly given the uncertainty over the pilot EE trading schemes as well as the targets and priorities for the 13th FYP.

A. Project Components

24. **Component 1. Improving Market-based Fiscal Incentives for Energy Savings**

(indicative cost estimate: US\$10 million GEF grant): This component will support MOF the development and implementation of market-based fiscal incentives for EE, particularly during the 13th FYP, and establish policy and institutional frameworks and develop detailed methodology for energy savings M&V. This component consists of three sub-components:

- (a) ***Developing market-based fiscal incentives for EE during the 13th FYP:*** MOF is now providing financial incentives to pilot Energy Conservation and Emission Reduction cities, and contemplating new market-based fiscal incentives for EE during the upcoming 13th FYP. This sub-component will support MOF to (i) improve the implementation of the current fiscal incentives to the pilot Energy Conservation and Emission Reduction cities; and (ii) develop innovative EE fiscal incentives for the 13th FYP.
- (b) ***Improving energy savings MRV system.*** This sub-component will primarily (i) review international experience; (ii) develop governing principles and refine policy requirements for measurement, reporting, and verification (MRV); (iii) develop consistent, operational, and standardized energy savings MRV methodologies, templates, and case studies at project-level for most commonly encountered EE technologies under the five major technology categories, and at enterprise-level for each major energy-intensive sector; and (iv) recommend institutional management system for third-party verifiers, including accreditation and management of third-party verification agencies and professionals, and a technical expert group as the methodology panel to approve and update energy saving M&V methodologies.
- (c) ***Building capacity for implementation of the EE fiscal incentives.*** This sub-component will build capacity for (i) third-party verifiers, ESCOs, priority enterprises, and provincial energy efficiency centers on energy savings MRV; and (ii) selected pilot energy conservation and emission reduction cities under the MOF fiscal incentive program to help them improve the implementation of their EE programs through piloting innovative market-based mechanisms and strengthening M&V.

25. **Component 2. Supporting Development and Implementation of Priority Energy Efficiency Programs**

(indicative cost estimate: US\$7 million GEF grant): This component will support NDRC the development and implementation of priority EE policies and programs for the 13th FYP, particularly the envisioned total energy consumption cap and market-based mechanisms for energy savings such as the pilot Energy Saving Certificates trading scheme. This component consists of three sub-components:

- (a) ***Supporting development and implementation of priority EE policies and programs for the 13th FYP.*** This sub-component will (i) set the total energy consumption cap and energy intensity reduction targets for the 13th FYP; (ii) allocate the targets to the provinces and priority enterprises for the 13th FYP; (iii) improve the current monitoring and evaluation system to meet the 13th FYP targets; (iv) prepare the 13th FYP EE action plan; (v) design the 13th FYP EE priority programs; (vi) develop the EE 13th FYP; (vii)

recommend amendment of the Energy Conservation Law; (viii) roll out the online energy monitoring system nationwide; and (ix) support implementation of priority EE policies and programs, particularly the market-based mechanisms for the 13th FYP.

- (b) ***Designing pilot EE trading framework and mechanisms.*** This sub-component will (i) undertake analytical studies on the rationale and the economic impact analysis of the proposed EE trading scheme; (ii) design a pilot EE trading scheme, including but not limited to options of trading parties, eligibility of obliged parties, nature of the cap, cap setting, allowance allocation, compliance period and grace period, trading rules, offset mechanism, penalties, pricing mechanisms, risk management, and evaluation procedures and guidelines; (iii) develop implementation guidelines; (iv) develop EE trading regulations and institutional frameworks; (v) coordinate between EE trading with the ongoing pilot ETS scheme; and (vi) post evaluate the pilot EE trading scheme to monitor results and draw lessons learned.
- (c) ***Building capacity for implementation of market-based mechanisms.*** This sub-component will build capacity for EE trading. A curriculum will be developed, trainers will be trained and then training rolled out to target at central and provincial government officials and staff, the participating enterprises, service providers (such as ESCOs) and non-obligated market participants (such as financial institutions), and covering topics of policy and regulatory frameworks, implementation guidelines, compliance obligations, penalties, trading rules and arrangements, and the institutional arrangements. It will be coordinated with the capacity building of energy savings M&V under Component 1.

26. **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). MOF is responsible for fiscal incentive policies, and energy savings M&V provides underpinning for output-based fiscal incentives. NDRC is responsible for sector policies, in particular, achieving the EE targets under the 12th and 13th FYP, managing the 17,000 priority enterprises program, and implementing the envisioned EE trading scheme. It was agreed that MOF and NDRC will coordinate closely on this project and both be represented in the Project Steering Committee. MOF will lead the implementation of Component 1 on market-based fiscal incentives for EE and energy savings M&V. NDRC will lead the implementation of component 2 on priority EE programs and market-based mechanisms. The PMO under the MOF will provide overall coordination of project implementation.

B. Project Financing

Lending Instrument

27. The proposed project will use GEF Grant.

Project Cost and Financing

28. The proposed project is a stand-alone GEF project. The project cost is US\$17.8 million from GEF grant. Also, US\$104 million from the national and local governments, enterprises, and financial institutions will be provided for activities complementary to the Project during the project's lifetime. The GEF project design was approved by the Bank management, Chinese government, and the GEF Council in June 2012.

Table 1. Project Costs

Project Components	Project cost (\$million)	GEF Financing	% Financing
1. Improving fiscal incentives for energy savings	10.00	10.00	100%
2. Supporting development and implementation of priority energy efficiency programs	7.00	7.00	100%
3. Supporting project management and coordination	0.80	0.80	100%
Total Baseline Costs	17.80	17.80	100%
Physical contingencies	0.00	0.00	0%
Price contingencies	0.00	0.00	0%
Total Project Costs	17.80	17.80	100%
Total Financing Required	17.80	17.80	100%

C. Lessons Learned and Reflected in the Project Design

29. The project design has incorporated lessons learned from international and Chinese experiences. In particular, in preparation of the project, with funding support from ESMAP, two studies were commissioned to review international experiences regarding energy savings M&V and coordination of EE, RE, and ETS schemes and their relevance to China's conditions. Some key lessons learned are summarized below.

• ***Energy policy seeks to achieve multiple aims, and it is justified to set multiple targets of EE, RE, and carbon emissions.*** Many developed countries, such as EU countries and some U.S. states, have set EE, RE, and carbon emission targets at the same time, like China. The overarching objectives of energy policy are multi-dimensional, covering energy security (reducing energy supply and pricing vulnerability), resource conservation, increased access and affordability for the poor, as well as improved local environment and global climate change mitigation. These multiple objectives led to multiple targets for EE, RE, and carbon emissions in which each contributes to certain areas of energy policy. In China, EE not only makes the single largest contribution to the carbon intensity reduction target, but also addresses concerns of energy security and resource scarcity.

• ***Multiple policy objectives have led to the use of multiple trading schemes, and carbon cap and trade alone will not tap the full potentials of energy efficiency.*** This is because carbon pricing alone cannot remove all the market barriers and failures for energy efficiency, partly due to the low price elasticity at least in the short run. Use of EE trading scheme focuses abatement on energy reduction, which has been seen to benefit energy security, fuel poverty, reduction of energy bills, avoiding investment in energy system expansion, and is complementary to carbon cap and trade. There is a need for complementary EE policies with carbon reduction policies. This also ensures that if one policy fails to meet the carbon reduction target, the other complementary policies may compensate.

• ***International experience from the UK, Italy, and California demonstrates that the EE, RE, and carbon trading schemes can co-exist and complement well with each other.*** But it is important for close coordination among the multiple trading schemes to avoid conflict, particularly on the target allocation, coverage, and obligated parties. In these countries, each trading scheme targets at different obliged parties, systems, and sectors. In Europe, for example, the ETS covers large industries and power generators to achieve emission reduction targets; while the complementary Energy Saving Certificates trading puts EE obligations on electricity distributors, covering decentralized consumers in the residential and commercial sectors at demand side not directly covered by the ETS to tap the additional emission reduction potentials. Whenever and whenever necessary, changes are made for the trading schemes to avoid any conflicts. For example, when the trading schemes apply to the same sectors and obligated parties, specific rules are introduced to avoid overlap of energy coverage (e.g. primary fuels vs electricity). The key is to have institutional coordination at the top policy level for EE, RE, and carbon reduction, and each trading scheme targets at different obliged parties, sectors, or energy fuels.

• ***Measurement, reporting, and verification (MRV) are essential to both EE trading and ETS schemes.*** MRV is a pre-requisite to both the EE trading and ETS schemes. Tokyo, for example, spent ten years to put in the MRV system before they formally launch the ETS scheme. This is particularly true in China, where 90 percent of the CO₂ emissions come from the energy sector, therefore, energy savings MRV will not only provide the critical inputs to the EE trading, but also the ETS system.

• ***It is important that China's energy savings M&V system builds on international experience.*** There is a considerable body of international experience and knowledge on energy savings and carbon emissions MRV methodologies and institutional frameworks, such as the International Performance Measurement & Verification Protocol (IPMVP) for energy savings and Clean Development Mechanism (CDM) at project level, the California Energy Efficiency Evaluation Protocol at program level, MRV in EU ETS, and energy savings M&V in European White Certificates Trading. Lessons learned from international experience demonstrated that (a) a clear definition of concept is important to avoid interpretation divergence during protocol and methodologies implementation; (b) flexibility and broad applicability of protocol is one of the key elements to ensure success; and (c) the level of rigorous and costs of M&V depend on the objective of the project or program evaluation, project size, and expected savings. It is important to maintain a balance between the complexity and robustness of the methodologies and the time and effort required to develop and implement them in real projects. In addition, transparent

institutional structure and decision-making process are critical to establishment of a credible energy savings M&V system. Such an institutional structure could include (a) an accreditation body to accredit the third-party verification agencies and professionals with transparent criteria and procedures, manage them, and ensure quality control periodically; (b) a strong methodology panel with some of the best experts in the market to develop, approve, and update the M&V methodologies to ensure credibility of the whole scheme; and (c) an independent and executive body to oversee the M&V process and make arbitration, if required.

• ***Flexible approach to adapt to government's priorities and changing environment is required:*** This is because this project coincides with the 13th FYP, and the government's targets and priorities for the EE programs for the 13th FYP have yet to be developed. In addition, China is experimenting a few new market-based mechanisms and the policy environment changes quite fast. Therefore, flexibility and adaption were essential to meet the government's request by providing timely assistance to the decision-making process and achieve the project's objectives.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

30. The PMO has been established under the Economic Construction Department of the Ministry of Finance (MOF). The PMO will be responsible for overall implementation, coordination, monitoring and reporting during project implementation.

31. A Project Steering Committee will be set up to provide overall strategic and policy guidance and coordinate between various government agencies to the implementation of the project activities. MOF is responsible for fiscal incentive policies, and energy savings M&V provides underpinning for output-based fiscal incentives. NDRC is responsible for sector policies, in particular, achieving the EE targets under the 12th FYP and 13th FYP, managing the 17,000 priority enterprises program, and implementing the envisioned EE trading scheme. It was agreed that MOF and NDRC will coordinate closely on this project, which is essential for effective and successful project implementation. MOF and NDRC will both be represented in the Project Steering Committee and the PMO, and assign dedicated staff working on this project. MOF will lead the implementation of Component 1 on market-based fiscal incentives for EE and energy savings M&V, NDRC will lead the implementation of Component 2 on priority EE programs and market-based mechanisms, and the PMO under the MOF will provide overall coordination of project implementation.

32. The PMO has 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 year procurement plan.

B. Results Monitoring and Evaluation

33. Monitoring of the implementation of the proposed project will involve: (a) the monitoring of performance indicators as included in the results framework in Annex 1; (b) annual progress reports; and (c) a midterm review of implementation progress. The PMO will be responsible for

overall monitoring and systematic evaluation of implementation progress including collection of project performance information and reporting on the impact and results of the project.

C. Sustainability

34. The likelihood of sustainability of the project is high. The government's commitment to energy conservation is high, implementing administrative measures of allocating energy saving targets to provinces and key enterprises, providing fiscal incentives, and shifting towards market-based mechanisms. The establishment of an M&V system is fundamentally important to enable the implementation and evaluation of all these measures, and would play a critical role in both the envisioned EE trading and ETS schemes. The market-based EE trading scheme sustains the energy conservation commitment and efforts by providing a market-based option for the obliged parties to meet their energy savings targets cost effectively, while also incentivizing non-obliged parties to investing in EE measures to generate tradable EE certificates. Close monitoring and coordination with the carbon cap-and-trade scheme will also ensure that the two trading schemes will complement each other. The program design integrated policy support, institutional strengthening, technical studies, and capacity building to ensure sustainability of the proposed interventions to achieve a sustainable growth of EE development in China.

V. KEY RISKS AND MITIGATION MEASURES

A. Risk Ratings Summary Table

	Rating
Stakeholder Risk	Moderate
Implementing Agency Risk	
- Capacity	Moderate
- Governance	Low
Project Risk	
- Design	Substantial
- Social and Environmental	Low
- Program and Donor	Moderate
- Delivery Monitoring and Sustainability	Low
- Other (Optional)	
- Other (Optional)	
Overall Implementation Risk	Substantial

B. Overall Risk Rating Explanation

35. The project is rated as substantial risk. Even though the Third Plenary Session of the 18th Central Commission of the Communist Party of China has decided Energy Savings Certificates Trading as one of the top reform priorities, the pilot options of the envisioned Energy Saving Certificates Trading is still under consideration by the top-level decision makers, given the

concern over the potential overlap between the Energy Saving Certificates trading and the carbon cap-and-trade scheme. In addition, the EE trading is new to China, and complex to design and implement. Furthermore, the uncertainty over the EE targets and priorities in the upcoming 13th FYP adds another layer of uncertainty. The Bank team has been working with a top-level think tank in China to develop a roadmap and top-level design of coordination between Energy Saving Certificates trading, Renewable Energy Certificates trading, and Carbon Cap and Trade systems in China, and conducted a wide range of stakeholder consultations during project preparation. The project will closely monitor the progress of carbon cap-and-trade scheme and coordinate with key stakeholders to reduce duplication and enhance effectiveness of the interventions. The project design maintains high level of flexibility, and the Bank team will undertake review and make necessary adjustments during mid-term review. In addition, despite strong support from the central government, the proposed project may run into resistance from some local governments and enterprises due to potential conflict of interest and resistance to innovation. Furthermore, the problem is exacerbated by the small number of competent third-party verification agencies for energy savings. The project will provide extensive training and capacity building for key stakeholders, cultivate the market to spur the development of third-party verifiers and capitalize on extensive international experience to design a robust and credible energy saving M&V system.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analyses

36. The proposed project will have potentially significant impacts on energy conservation and emission reduction in China, as a well-established energy savings M&V system will bring credibility and accountability to the government's EE targeting systems and the government supported incentive programs. It is the foundation for establishing the Energy Savings Certificates Trading scheme. The EE trading system is expected to provide additional incentives for participating enterprises making extra efforts on energy conservation to exceed the allocated EE targets, which would lead to additional carbon emission reductions.

37. The broad justification of the proposed project is based on incremental cost reasoning required by the GEF. The incremental global environmental benefit is measured by the incremental CO₂ emissions reduction attributable to the GEF assistance based on comparison of a baseline scenario and a GEF alternative scenario. Since the proposed project support primarily improvements of policies and implementation capacities, the full materialization of the impact of these policy and capacity improvements on emissions outcome is likely to take longer time than the implementation period of the project itself. A conservative approach is adopted to estimate the incremental benefit associated with the proposed project: (i) the annual CO₂ emissions reduction achieved at the end of project implementation is estimated based on incremental EE improvements attributable to the GEF direct global environmental benefits during the project implementation period; (ii) the cumulative CO₂ emissions reduction attributable to the GEF direct global environmental benefits at the end of project implementation is calculated for 10 years out; and (iii) an undiscounted GEF incremental cost per ton of CO₂ emissions reduction is calculated. Based on the scenario analysis, the total estimated incremental emissions reduction attributable to the GEF direct global environmental benefits at the end of project implementation is about 88 million tons of CO₂. The undiscounted GEF incremental cost is about US\$0.2/ton-

CO₂, compared to the current price of about US\$4/ton-CO₂ of certified emission reduction (CER) in the European Union. Please see details in the GEF incremental cost analysis.

B. Technical

38. The technical design and approach for this proposed project integrated features of relevant global experiences and knowledge on energy savings M&V and EE trading. EE technologies are mature with broad commercial applications. The project will primarily support technical studies and policy analysis. The PMO will hire world class international and Chinese technical experts to review and approve those activities, and provide quality control of the results. Capacity building will be provided to the PMO during implementation.

C. Financial Management

39. The PMO established at the MOF Economic Construction Department will be responsible for the project management and implementation, including project financial management (FM). The grant proceeds, including overseeing the Designated Account (DA), will be managed by MOF. The PMO has extensive experience with the Bank administered trust funds operations through implementing the GEF Thermal Power Efficiency Project. The PMO's project financial staff has been well trained through participating the Bank's FM and disbursement trainings and on-job experience accumulated in the past few years. As such, continuity of PMO staff is critical to assure FM and disbursement work running in an efficient and effective manner. In addition, to standardize the FM work, a well prepared FM Manual (FMM) has been in place for the existing project in the PMO and updated to accommodate the feature and arrangements of this project.

40. With implementation of the proposed actions, the FM arrangements will satisfy the World Bank's requirements under OP/BP 10.00. See Annex 3 for additional information

D. Procurement

41. A procurement capacity and risk assessment of the PMO was conducted at project pre-appraisal. The PMO was the implementing agency for the recently closed GEF Thermal Power Efficiency Project (P098654) and its staff has the relevant experience and capacity to conduct procurement under the new project. The key procurement risks identified are that the PMO staff may change during project implementation and potential delay and non-compliance caused by the lack of experience of the new comers in PMO. Mitigation measures agreed include: (a) procurement training to be further provided to the PMO staff as needed; and (b) a procurement agent or an individual procurement expert with experience in World Bank procurement procedures to be recruited by the PMO as necessary to guide new staff. Further details on procurement are provided in Annex 3. A procurement plan for the first 18 months of project implementation has been discussed at pre-appraisal and will be agreed no later than project negotiations.

E. Social (including Safeguards)

42. The project is of technical assistance nature. There is no land acquisition, resettlement, physical cultural resources or indigenous people involved in the project, therefore, there is no social safeguards policy triggered.

43. The project will involve consultations with civil society organizations and non-government organizations. The project will benefit women and men equally. During consultation and assessment with beneficiaries, surveys and interviews will be designed with gender sensitivity to ensure that women are given equal opportunities.

F. Environmental Safeguards

44. The proposed project consists of improving market-based fiscal incentives for energy savings, and supporting development and implementation of priority EE programs in China. These are all policy and institutional system level activities that will lead to positive environmental impacts through promoting energy saving in China. The project does not include any physical works, nor will it result in direct physical investments. There are no adverse environmental and social impacts envisaged, therefore, the project is classified as Category C, no further EA action is required as per provisions of OP4.01.

G. Other Safeguards Policies Triggered *(if required)*

Annex 1: Results Framework and Monitoring
China: Developing Market-based Energy Efficiency Program

PDO Level Results Indicators	Core	Unit of Measurement	Baseline Original Project Start (7/15)	Cumulative Target Values					Frequency	Data Source/ Methodology	Responsibility for Data Collection	Comment
				Y1	Y2	Y3	Y4	Y5				
1. Energy savings M&V system improved	<input type="checkbox"/>		NA				Energy savings M&V methodologies developed	Capacity of stakeholders built for MRV system	Annual report	MoF/NDRC	PMO	
2. Market-based mechanisms for energy savings designed	<input type="checkbox"/>		NA			Development of EE 13 th FYP supported		Market-based EE trading mechanisms designed	Annual report	NDRC/MOF	PMO	

Intermediate Results Indicators	Core	Unit of Measurement	Baseline Original Project Start (7/15)	Target Values					Frequency	Data Source/ Methodology	Responsibility for Data Collection	Comment
				Y1	Y2	Y3	Y4	Y5				
Innovative EE fiscal incentives designed	<input type="checkbox"/>						Improvement in fiscal incentives in pilot cities program supported	Innovative EE fiscal incentives designed	Annual report	MOF/NDRC	PMO	
Implementation capacity improved in selected pilot cities	<input type="checkbox"/>					Pilot cities' monitoring mechanisms developed	Pilot municipal government's implementation guidelines supported		Annual report	MOF/NDRC	PMO	

Intermediate Results Indicators	Core	Unit of Measurement	Baseline Original Project Start (7/15)	Target Values					Frequency	Data Source/ Methodology	Responsibility for Data Collection	Comment
				Y1	Y2	Y3	Y4	Y5				
Energy savings M&V methodologies and guidelines developed	<input type="checkbox"/>	No. of methodologies			5	12	18	25	Annual report	MOF/ NDRC	PMO	
Capacity of stakeholders built for MRV system	<input type="checkbox"/>	No. of people trained	0		100	400	800	1200	Annual report	MOF/ NDRC	PMO	
Priority EE policies and programs supporting 13 th FYP designed	<input type="checkbox"/>					Development of EE 13 th FYP supported	Priority EE policies and programs for 13th FYP developed		Annual report	NDRC/ MOF	PMO	
Market-based mechanism designed	<input type="checkbox"/>		NA					EE trading mechanisms designed	Annual report	NDRC/ MOF	PMO	
Capacity of stakeholders built for market-based mechanisms	<input type="checkbox"/>	No. of people trained	NA		100	200	400	800	Annual report	NDRC/ MOF	PMO	
Annual energy savings	<input type="checkbox"/>	Mtce	0					3.6	Annual report		PMO	
Avoided CO ₂ emissions ¹	<input type="checkbox"/>	Mt	0					88	Annual report		PMO	

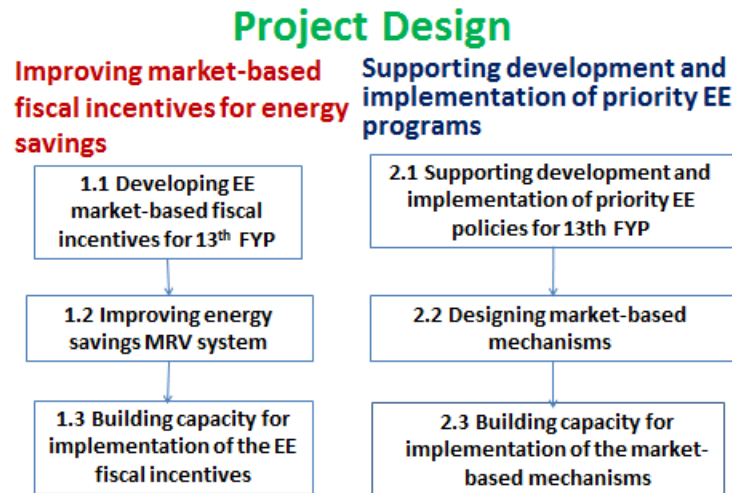
¹ Assuming 10-year lifetime of energy efficiency investment projects and emission factor of 2.44 ton CO₂/tce.

Annex 2: Detailed Project Description

China: Developing Market-based Energy Efficiency Program

1. The proposed project would be comprised of the following three components: (a) improving market-based fiscal incentives for energy savings; (b) supporting development and implementation of priority energy efficiency programs; and (c) supporting project management and coordination, as illustrated in figure 1 below.
2. The PMO has prepared a GEF Project Implementation Plan, with a detailed work plan for each activity and task, outputs, budget, schedule, PMO structure, and plans for supervision and quality control, as well as the first year procurement plan.
3. It should be noted that the tasks outlined below are those urgent to be implemented during project preparation and the initial-year work program, agreed between the MOF and the Bank. Other tasks will be detailed and confirmed during the annual review of the work program to be carried during the supervision of the project to leave flexibility during project implementation, particularly given the uncertainty over the pilot EE trading schemes as well as the targets and priorities for the 13th FYP.

Figure 1. Project Design



4. **Component 1. Improving Market-based Fiscal Incentives for Energy Savings** (indicative cost estimate: US\$10 million GEF grant): This component will support MOF the development and implementation of market-based fiscal incentives for EE, particularly during the 13th FYP, and establish policy and institutional frameworks and develop detailed methodology for energy savings M&V. This component consists of three sub-components, as shown in the left side of figure 1:

5. ***Sub-component 1.1: Developing market-based fiscal incentives for EE during the 13th FYP.*** MOF is now providing financial incentives to pilot Energy Conservation and Emission

Reduction cities, and contemplating new market-based fiscal incentives for EE during the upcoming 13th FYP. This sub-component will support MOF for the following activities:

- *1.1.1 Improving the implementation of the current fiscal incentives to the pilot Energy Conservation and Emission Reduction cities.* This sub-task will: (i) survey and review the successful policies and measures of pilot cities; (ii) identify barriers to implementation in pilot cities; (iii) assess and recommend improved monitoring and evaluation system; (iv) promote exchange of experience among the pilot cities; and (v) recommend improvement of fiscal incentives of the pilot city program.
- *1.1.2 Developing innovative EE fiscal incentives for the 13th FYP.* This sub-task will first review and summarize international experience of EE fiscal incentives, and then develop innovative market-based EE fiscal incentives to help achieve the 13th FYP priority programs and targets.

6. ***Sub-component 1.2: Improving energy savings MRV system.*** This sub-component will include the following activities:

- *1.2.1 Reviewing the international experience.* This sub-task will build on a preliminary study that has been done on international experience to carry out more in-depth review on governing and institutional framework for MRV systems and make valuable reference for China.
- *1.2.2 Refining MRV policy requirements.* For “Measurement”, it includes (i) refining boundary and baseline at both project and enterprise levels; and (ii) reviewing and improving the consistency and applicability of existing M&V methodologies. For “Reporting”, it includes: (i) developing legal framework for mandatory reporting; (ii) putting in place data disclosure system; (iii) refining enterprise reporting requirements: including data requirements for enterprises: where, when, what meters, adjustment factors, baseline, and conversion factors, and the format/quality of reporting documents; and (iv) linking with the online energy monitoring platform. For “verification”, it includes developing consistent comprehensive verification principles such as level of rigor (depending on the purposes), duration, procedure, and requirements for project-level M&V vs enterprise-level MRV. In addition, this subcomponent will define terminology and glossary and coordinate between EE MRV and ETS MRV methodologies.
- *1.2.3 Developing energy saving MRV methodologies.* This sub-task will develop methodologies at the following two levels: (i) developing methodologies at the individual project level for the purpose of output-based EE financing mechanisms and ESCOs. International best practices regarding individual-project M&V (ASHRAE 14 and IPMVP), as well as many other protocols based on these standards and adjusted for specific programs will be taken into consideration during this activity. A survey and analysis conducted during project preparation identified insights and limitations regarding the M&V activities currently being carried out in China. These insights and limitations will be reviewed to enable making improvements to the newly designed

methodologies. The methodologies to be developed will be selected according to the energy-saving potential and replication potential of most commonly encountered EE technologies among the five main categories already identified. The objective will be to target a limited set of methodologies that represents a large share of the EE potential among large energy users in China. Detailed operational methodologies will be developed, including guidelines, templates and instructions for their utilization. The new and the existing enhanced methodologies will be peer-reviewed to ensure that the resulting methods are robust, applicable and accurate. Case studies will be provided to help facility owners, consultants and third-party verifiers understand how those methodologies should be applied in practice; and (ii) developing methodologies at enterprise level for the purpose of the potential EE trading and evaluation of the EE targets for the 12th and 13th FYP. The activities will first review international practices, such as EU ETS and EE Trading in Europe, India, and some US states; and develop detailed operational guidelines for enterprise energy saving M&V and reporting system by key energy-consuming sector.

- *1.2.4 Recommending institutional management system for third-party verifiers.* This sub-task will (i) define the roles and functions of institutional management system for the third-party verifiers' supervising body and its relationship with third-party verifiers. The management structure proposed will cover (a) the decision-makers at the policy level; (b) the system operator in charge of third-party supervision; (c) the roles and functions of the methodology panel for methodology development, approval, and update. The responsibilities and processes for the development, quality control, approval and updating of methodologies will be defined, including the criteria and procedures for both the methodologies initiated by the methodology panel (top-down) and methodologies proposed by verifiers (bottom-up); (d) the accreditation and regulation body of third-parties. The tasks will define the responsibility, criteria, and procedure to certify third-party verifier professionals and accreditation of third-party verification agencies, and how to regulate and oversight third-party verifiers; and (e) the arbitration body in case of disputes between the third party and the host facility owner. Stakeholder consultations will be held to discuss the proposed schemes for third-party verifier management and methodology development to ensure that most relevant comments and suggestions from the parties involved will be taken into consideration; (ii) develop regulation and oversight implementation guideline for accreditation and management of third-party verifiers; and (iii) establish the methodology panel by developing detailed internal operational procedures and guidelines for methodology development. Support will be provided to establish the core team and build its internal capacity for developing methodologies during the initial establishment stage. A self-sustainable mechanism will be proposed to ensure long-term financing of this institution.

7. Sub-component 1.3: Building capacity for implementation of the EE fiscal incentives. This sub-component will include the following activities:

- *1.3.1 Building capacity for energy savings MRV.* Program design will consider the best practices in the international market, including selecting the stakeholders to be trained (third-party verifiers, provincial energy monitoring centers, ESCOs, and enterprises),

curriculum design for each group, train-the-trainer modules that include theoretical and on-the-job training, the trainer selection criteria, details regarding certification scheme operation and the associated institutional rules and procedures. Training will be provided to disseminate information about the methodologies and how they are developed and applied. A first round of pilot training will be conducted to identify areas of improvement in terms of contents and materials before expanding the scale of the training program.

- *1.3.2 Building capacity for pilot energy conservation and emission reduction cities under the MOF fiscal incentive program to implement their EE programs at the local government level.* This sub-task will (i) select 3-4 pilot energy conservation and emission reduction cities under the MOF fiscal incentive program, which is providing 400-600 million RMB per year for three years to each pilot city if they can reach higher targets than those required under the 12th FYP; (ii) support the selected cities to develop and pilot innovative market-based mechanisms such as EE trading or EE financing mechanisms; (iii) provide technical assistance in planning, implementation plans, policies, business and financing models to remove barriers; (iv) support enforcement and monitoring; and (v) provide training.

8. **Component 2. Supporting Development and Implementation of Priority Energy Efficiency Scheme** (indicative cost estimate: US\$7 million GEF grant): This component will support NDRC the development and implementation of priority EE policies and programs for the 13th FYP, particularly the envisioned total energy consumption cap and market-based mechanisms for energy savings such as the pilot Energy Saving Certificates trading scheme. This component consists of three sub-components, as shown in the right side of figure 1.

9. ***Sub-component 2.1: Supporting development and implementation of priority EE policies and programs for the 13th FYP.*** This sub-component will include the following activities:

- *2.1.1 Setting the total energy consumption cap and energy intensity reduction targets for 13th FYP.* This sub-task will (i) set the total energy consumption cap and energy intensity reduction targets with modeling and scenarios, and coordinate with carbon reduction and RE targets; (ii) analyze the impacts of economic structure changes on the EE targets; (iii) analyze technical potential of energy savings in each key energy-intensive sector such as the power, industrial, transport, and building sectors to validate the EE targets and allocate the targets to each key energy-intensive sector; (iv) develop paths to achieve the 13th FYP targets; and (v) recommend policies for the 13th FYP.
- *2.1.2 Allocating targets to the provinces and priority enterprises for the 13th FYP.* The national targets will be allocated to each province in the following three steps: (a) the government adopts an analytical allocation framework that considers key factors of each province such as the economic structure, development status, regional differences, potential of energy efficiency improvement, total energy demand, and EE performance during the 12th FYP; (b) then, the national government will negotiate with provincial governments in cases where the provincial governments request a compromise given their concerns about the impacts of the allocated targets on economic development at the provincial level. The coordination between the central and provincial governments

heavily relies on the analytical framework as the most valuable tool of persuasion for local and provincial government officials; and (c) after the consultation process, the central government will make the final decision on the target allocation. This activity will focus the first step of developing the analytical allocation formula. This activity will also define the criteria of priority enterprises under the 13th FYP, develop methodology to allocate targets to each priority enterprise, and estimate energy savings from the priority enterprise program.

- *2.1.3. Improving the current evaluation system to meet FYP EE target.* China's EE targets are set and managed at national level, but implementation lies in the provinces. Currently, NDRC visits each province every year to evaluate the progress made towards the allocated EE targets on a sample basis. However, the sum of energy intensity reductions in all provinces from a bottom-up approach does not equal to the national level reductions from a top-down approach. This task will assess the current evaluation system at the provincial level and the statistics system at the national level, and help improve the current systems. This sub-task will recommend improved monitoring and evaluation system for the 13th FYP, particularly the improved scoring card system, monitoring and evaluation plan for the total energy consumption cap, and linkage with the online energy monitoring system.
- *2.1.4 Preparing the 13th FYP EE action plan.* This sub-task will develop the 13th FYP EE action plan, including policies, measures, key EE technologies, implementation responsibilities, and capacity building to achieve the 13th FYP EE targets.
- *2.1.5 Designing the 13th FYP EE priority program.* This sub-task will (i) review EE priority programs for 11th and 12th FYP; and (ii) develop the 13th FYP EE priority programs, with a focus on total energy consumption cap and increased use of market-based mechanisms.
- *2.1.6 Developing the EE 13th FYP.* This sub-task will integrate the findings from all the above studies, and prepare the EE 13th FYP, and conduct stakeholder consultations.
- *2.1.7 Recommending amendment of the Energy Conservation Law.* This sub-task will (i) review the current Energy Conservation Law and identify its impediment to new situation; (ii) review existing best practices of policy measures and implementation system, and assess whether it is justified to include some of them in the amended EE Law; (iii) recommend amendment; (iv) draft amended Energy Conservation Law; and (v) undertake stakeholder consultations.
- *2.1.8 Rolling out the online energy monitoring system nationwide.* Establishing online energy monitoring platform in priority enterprises is a top priority for Chinese government to strengthen energy savings M&V. The World Bank/GEF China Energy Efficiency Financing Project has supported the top level design of the online energy monitoring platform, which has resulted in approval by the top decision makers and ongoing pilots in three provinces and three sectors. The government plans to replicate this experience to nationwide covering the 17,000 priority enterprises. This sub-task will support the design of the national online energy monitoring platform.

- *2.1.9 Supporting NDRC to develop and implement priority EE policies and programs*, particularly the market-based mechanisms for the 13th FYP, once the EE targets and priorities for the 13th FYP are determined.

10. ***Sub-component 2.2: Designing pilot EE trading framework and mechanisms.*** This sub-component will include the following activities:

- *2.2.1 Undertaking analytical studies on the rationale and the economic impact analysis of the proposed EE trading scheme.*
- *2.2.2 Developing a pilot EE trading scheme.* This includes but not limited to (a) trading scope and coverage: options of trading parties and eligibility of obliged parties, for example, the rules determining which enterprises are covered, which thresholds apply as a minimum size for inclusion and what is the enterprise boundary for included energy/eligible savings; (b) the nature of the cap--whether it requires performance against energy consumption or energy saving; (c) the allowance allocation methods, such as benchmarking, allocations according to historic baselines, and the rules applied to new entrants and closing installations/enterprises; (d) offset mechanisms that incentivise action beyond the scope of the obligated entities, so can achieve more cost effective action for the system as a whole--study the pros and cons of permitting offsetting, options for offsetting eligibility and the rule-set for offsets if they are to be permitted; (e) the design of penalties to provide a proportionate incentive for compliance and a regime that adequately deters feasible routes to non-compliance; (f) rules for trading and penalties associated with infringements; (g) compliance period and the establishment of grace periods and the basis for regulator discretion in the application of penalties; (h) the system evaluation procedures to check the allocated cap is met, and guidelines for carrying out evaluations; (i) pricing mechanisms such as pricing ceiling and floor, pricing for government intervention; and (j) risk management. The energy savings MRV system established under Component 1 will provide solid foundation for the trading.
- *2.2.3 Developing implementation guidelines.* EE trading will be an important measure towards policy objectives for the FYP. The implementation guideline will define timescales, and the relationship between the EE trading and the achievement of provincial EE targets for the period, including accounting principles for savings certificates subject to inter-provincial trading.
- *2.2.4 Developing EE trading regulations and institutional frameworks.* This activity includes (i) EE trading regulations. This will provide the regulatory basis for the implementation of the system, including the formal rules for participation and the responsibilities of the main stakeholders. It will include the rules by which enterprises and other market participants must comply, the role of the regulator in overseeing the trading market and the conduct of participant enterprises (including their MRV obligations). It is envisaged that the government may participate in the market to provide price stabilisation and capital support. The rules for that intervention will be defined so as to provide clarity to other market participants. The regulations will also cover accounting

rules for trading revenues and arrangements for appeals and arbitration; and (ii) institutional frameworks including who will regulate EE trading, how to regulate obliged enterprises and other market participants, how to regulate trading market, rules for the governments' involvement in the market, accounting method to account for enterprises' trading revenues, and arbitration.

- *2.2.5 Coordinating between EE trading and the ongoing pilot ETS scheme.* The framework for coordination will include: (a) system design interactions such as scope, coverage, cap/target setting; (b) system interactions such as registries and trading platforms; and (c) enforcement and penalty regimes.
- *2.2.6 Post evaluation of the pilot EE trading scheme.* It will cover: (a) evaluation of the direct results of EE trading, such as reported savings, trading market participation and, compliance performance, with appropriate sector disaggregation; (b) lessons learned, such as administrative/process effectiveness, the design effectiveness, success of capacity building, functioning of the market; and (c) impacts of the system including abatement performance, costs of compliance and cost effectiveness, wider consequences including the level and distribution of environmental pollution, social and competitiveness impacts.

11. ***Sub-component 2.3: Building capacity for implementation of market-based mechanisms.*** This sub-component will include the following activities:

- *2.3.1 Building capacity for EE trading.* This activity will include (a) developing the curriculum; (b) training the trainers; and (c) delivering the training. The training will be aimed at government officials and staff, the participating enterprises, service providers (such as ESCOs) and non-obligated market participants (such as financial institutions). The capacity building will cover policy and regulatory frameworks, implementation guidelines, compliance obligations, penalties, trading rules and arrangements, the institutional arrangements and use of the trading registry and platform. It will be coordinated with the capacity building of energy savings M&V under Component 1.

12. **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 incentive policies, and energy savings M&V provides underpinning for output-based fiscal incentives. NDRC is responsible for sector policies, in particular, achieving the 12th FYP and 13th FYP EE targets, managing the 17,000 priority enterprises program, and implementing the future EE trading scheme. It was agreed that MOF and NDRC will coordinate closely on this project and both be represented in the Project Steering Committee. MOF will lead the implementation of Component 1 on market-based fiscal incentives for EE and energy savings M&V, while NDRC will lead the implementation of component 2 on priority EE programs and market-based EE mechanisms. The PMO under the MOF will provide overall coordination of project implementation.

13. This component will (a) support implementation of the project activities, including procurement (preparing terms of reference and bidding documents), contract execution, financial management and disbursement; (b) oversee and coordinate the implementation of activities managed by implementation institutions for Component 1 and Component 2; (c) implement activities directly managed by the PMO, such as training programs on procurement, financial management and disbursement for the GEF Grant supported activities; and (d) monitor and report the progress and outputs of the project.

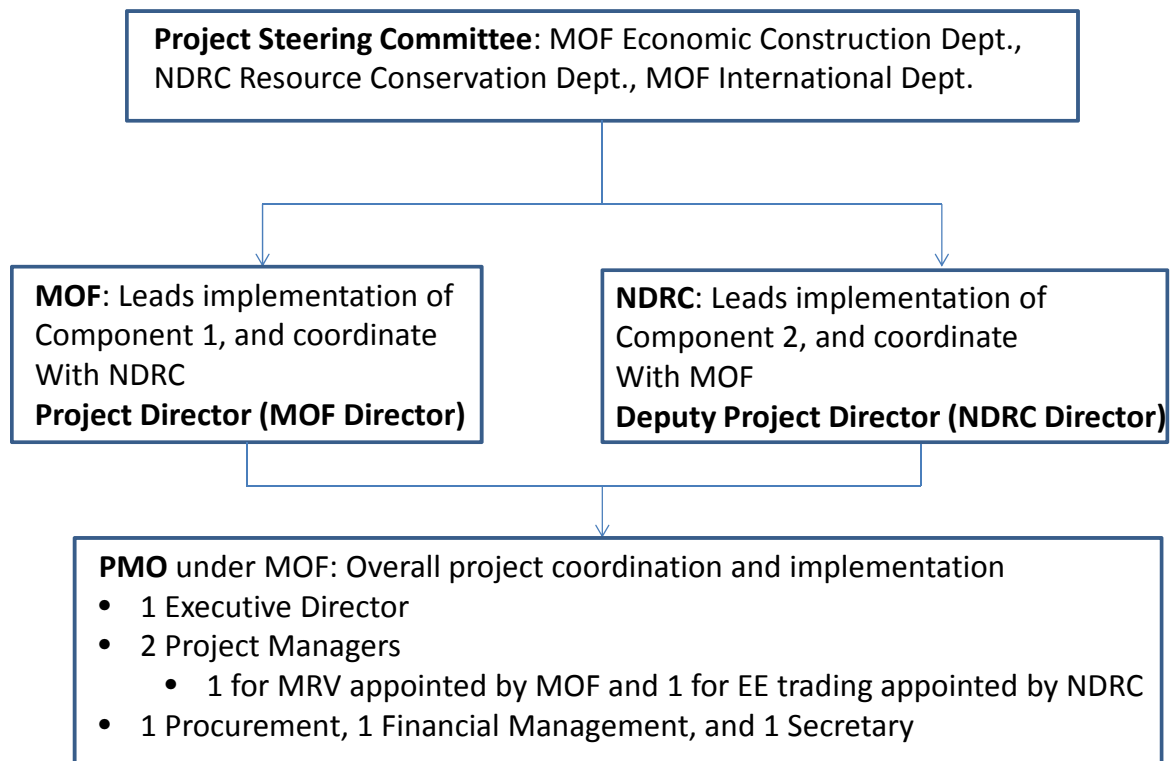
Annex 3: Implementation Arrangements

China: Developing Market-based Energy Efficiency Program

Project Institutional and Implementation Arrangements

1. The PMO has been established under the Economic Construction Department of the Ministry of Finance (MOF). The PMO will be responsible for overall implementation, coordination, monitoring and reporting of this project during project implementation.
2. A Project Steering Committee will be set up to provide overall strategic and policy guidance and coordinate between various government agencies to the implementation of the project activities. Currently, MOF is responsible for fiscal incentive policies, and energy savings M&V provides underpinning for output-based fiscal incentives. NDRC is responsible for achieving the 12th FYP and 13th FYP EE 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. MOF and NDRC will both be represented in the Project Steering Committee and the PMO, and assign dedicated staff working on this project. MOF will lead the implementation of Component 1 on market-based fiscal incentives for EE and energy savings M&V, NDRC will lead the implementation of Component 2 on priority EE programs and market-based mechanisms, and the PMO under the MOF will provide overall coordination of project implementation (Figure 2).

Figure 2. Project Implementation Arrangement



3. **Implementation agency risks:** The implementation arrangement risk is modest. MOF is in charge of fiscal policies, while NDRC is in charge of sector policies. A close collaboration between MOF and NDRC is essential to an effective and successful project implementation. In addition, the NDRC Environmental Protection and Resource Conservation Department and the NDRC Climate Change Department also need to closely coordinate between the proposed Energy Saving Certificates Trading scheme and the pilot carbon cap and trade schemes. The need for close coordination has been emphasized throughout the project preparation and reflected in the implementation arrangement.

4. The PMO has been implementing the Bank/GEF Thermal Power Efficiency Project, which was closed by June 30, 2014, under the Economic Construction Department of MOF. The NDRC Environmental Protection and Resource Conservation Department has been implementing the Bank/GEF China Energy Efficiency Financing Project. Therefore, all the implementing parties—MOF, NDRC, and PMO—are familiar with Bank procedures and requirements.

Financial Management, Disbursements and Procurement

Financial Management

5. The PMO's project financial staff has been well trained through participating the Bank's FM and disbursement trainings and on-job experience accumulated in the past few years. As such, continuity of PMO staff is critical to assure FM and disbursement work running in an efficient and effective manner. In addition, to standardize the FM work, a well prepared FM Manual (FMM) has been in place for the existing project in the PMO and updated to accommodate the feature and arrangements of this project.

6. Overall, the residual project FM risk after mitigation is assessed as Moderate

7. The PMO established at the MOF economic Construction Department will be responsible for the project management and implementation, including project FM related day-to-day works including project accounting and financial reporting. The PMO has extensive experience with the Bank administered trust funds operations through implementing the GEF Thermal Power Efficiency Project. The PMO has one financial officer who has been well trained through participating the Bank's FM and disbursement trainings and on-job experience accumulated in the past few years. Through observation and review of the educational background and work experience of the financial officer, the task team noted that the financial officer is qualified and appropriate to conduct the work expected to assume.

8. **Budgeting.** The project is fully financed by the grant proceeds. The PMO will prepare the annual project implementation plan and budget. Budget variance analysis will be conducted semi-annually by the PMO to inform management of significant variances from plan that may need corrective actions.

9. **Funds flow.** The Bank grant proceeds will flow from the Bank into a project Designated Account (DA) to be set up at and managed by MOF. MOF will be directly responsible for the

management, maintenance, and reconciliation of DA activities. Supporting documents required for Bank disbursements will be prepared and submitted by the PMO to MOF for further disbursement processing. MOF will, from the DA, reimburse the funds to the PMO for the Bank financed portion paid by PMO first or disburse the funds to contractors directly for payment of eligible expenditures.

10. **Accounting and financial reporting.** The administration, accounting and reporting of the project will be set up in accordance with: “Accounting Regulations for Trust Fund Projects” issued by MOF. The standard set of project financial statements has been agreed between the World Bank and MOF.

11. The PMO will be responsible for the overall project implementation, management, monitoring, and coordination. Original accounting documents for project activities will be retained by the PMO. As most of the project activities will be packed under several big contracts with simple payment transactions, the project accounting and financial statements will be manually prepared by the PMO together with MOF. The unaudited semi-annual project interim financial reports (IFRs) will be prepared and furnished to the Bank by the PMO no later than 45 days following each semester (the due dates will be August 15th and February 15th), in form and substance satisfactory to the Bank.

12. The task team will monitor the accounting process, including the adequacy of the financial management system, especially during the initial stage to ensure complete and accurate financial information are provided in a timely manner.

13. **Internal control.** The PMO has adequate financial management regulations in place. In addition, the project related accounting policy, procedures and regulations were issued by MOF, and the FMM will be prepared and issued to standardize the project FM procedures.

14. **Audit.** China National Audit Office (CNAO) has been identified as the auditor for the project. The annual audit reports will be issued by CNAO and will be due to the World Bank within six months after the end of each calendar year. CNAO has extensive experience with auditing the Bank financed operations. According to the World Bank Policy on access to Information, the audit reports for all investment lending operations for which the invitation to negotiate was issued on or after July 1, 2010, need to be made publicly available in a timely fashion and in a manner acceptable to the Bank. Audit reports will be made publicly available on the website of the provincial auditor. Following the World Bank's formal receipt of the audited financial statements from the borrower, the World Bank will also make them available to the public in accordance with the World Bank Policy on Access to Information.

Disbursements

15. Four disbursement methods are all available for the project: advance, reimbursement, direct payment and special commitment. Supporting documents required for Bank disbursement under different disbursement methods will be documented in the Disbursement Letter issued by the Bank.

16. One segregated DA in US dollar will be opened at a commercial bank acceptable to the

Bank and will be managed by MOF. The ceiling of the DA will be determined and documented in the Disbursement Letter. Upon receipt of the PMO's withdrawal applications, MOF will reimburse funds to the PMO for the Bank financed portion paid first by the PMO or directly disburse funds to the contractors for payment of eligible expenditures.

17. The GEF grants would be disbursed to finance one hundred percent (100%) of eligible expenditures (inclusive of taxes and duties) consisting of goods, non-consulting services, consultants' services, Training, and Operating Costs.

18. Retroactive financing will be determined by the TTL and CTR according to the Bank's policy and specified in the loan agreement.

19. **Supervision Plan.** The supervision approach for this project is based on its FM risk rating, which will be evaluated on regular basis by the FMS in line with the FMSB's FM Manual and in consultation with relevant task team leader. The initial FM supervision will focus on quality and timeliness of project accounting and financial reporting as well as compliance of the Bank's FM and disbursement related requirements.

Procurement

20. **Capacity and risk assessment.** Procurement performance by the PMO, the implementing agency under the recently closed GEF Thermal Power Efficiency Project (P098654), was satisfactory. The PMO staff who were on board at pre-appraisal have the requisite experience and capacity to conduct procurement under the new project. The procurement capacity and risk assessment identified that the main risk is that the PMO staff may change during the project implementation. Other risks are potential delay and non-compliance caused by the lack of experience of the new comers in the PMO. Mitigation measures agreed include: (a) procurement training to be further provided to the PMO staff as needed; and (b) a procurement agent or an individual procurement expert with experience in World Bank procurement procedures to be recruited by the PMO as necessary to guide new staff in the PMO. Procurement training with emphasis on selection and employment of consultants has been provided by the Bank Procurement Specialist to the staff of the PMO who will be involved in processing and approving procurement. Based on the above, the overall procurement risk is considered 'Moderate'.

21. **Applicable Guidelines.** Procurement will be carried out in accordance with the "*Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*" dated January 2011; and "*Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*" dated January 2011; and the provisions stipulated in the Grant Agreement. National Competitive Bidding (NCB) shall be carried out in accordance with the *Law on Tendering and Bidding of the People's Republic of China* promulgated by Order of the President of the People's Republic of China on August 30, 1999 subject to the modifications stipulated in the Grant Agreement in order to ensure consistency with World Bank Procurement Guidelines.

22. Procurement arrangements

- (a) Goods and non-consulting services procurement. The project will finance the procurement of information systems including computers, network and communications equipment, and general-purpose, development and application software. Office equipment would be procured too. The relevant Bank Standard Bidding Documents (SBD) will be used for ICB. National Model Bidding Documents for Goods issued by the Ministry of Finance in June 2012 shall be used for all NCB goods procurement. Non-consulting services to be financed under the project include contracts for measurement and verification, carbon trading and public awareness. Contracts for public awareness, proprietary equipment and patents in the energy sector may be procured through Direct Contracting. In such cases, the PMO shall submit to the Bank for its review and no objection a sufficiently detailed justification, including the rationale for direct contracting instead of a competitive procurement process and the basis for selecting a particular firm..
- (b) Selection of Consultants. Consulting services will be focused on policy reforms and regulation establishing in energy savings M&V and EE trading in China. Universities and research institutes may be included in shortlists as a source of consultants, provided they possess the relevant qualifications and they are not in a situation of conflict of interest. In such cases, QBS or CQS (for small assignments) would be used, if the shortlist also includes consulting firms that operate as commercial entities. The Bank's Standard Request for Proposals (SRFP) shall be used for all QCBS and QBS. Single-source selection (SSS) shall be used only in exceptional cases and shall be specified in the Procurement Plan (PP). A sufficiently detailed justification, including the rationale for SSS instead of a competitive selection process and the basis for recommending a particular firm or individual, will be required.
- (c) Training and Workshops. Plans for training and workshops will be developed by the PMO, and included in the project annual work plan for World Bank review. Expenditures incurred in accordance with the approved plans for training and workshops will be the basis for disbursement.
- (d) Procurement Plan. A procurement plan for the first 18 months of project implementation has been prepared by the PMO and has been reviewed by the Bank. The procurement plan will be agreed with the Bank no later than negotiations and will be made available in the Project's database and on the World Bank's external website. The PP will be updated annually or as required to reflect implementation needs and improvements in institutional capacity.
- (e) Frequency of Procurement Supervision. Procurement supervision will be carried out once a year. Procurement post reviews will be carried out by the World Bank, its consultants and/or by Auditors every 12 months. The procurement post review sampling ratio will be 1 out of 15 contracts.

23. Thresholds for Procurement Methods and Prior Review. The procurement methods and prior-review thresholds are indicated in the table below.

Thresholds for Procurement Methods and Prior Review

Expenditure Category	Contract Value Threshold (US\$)	Procurement/Selection Method	Prior Review Threshold (US\$)
1. Goods and Non-Consulting Services	≥3,000,000	ICB	All
	<3,000,000	NCB	The first two contracts
	<100,000	Shopping	First contract
	NONE	Direct Contracting	All
2. Consultants Services	>300,000	QCBS/QBS	≥100,000
	≤300,000	CQS	First contract
		Individual consultant	
		Single source selection (firm)	≥100,000
		Single source selection (individual)	≥50,000

24. Retroactive financing. Payment up to an aggregate amount not to exceed \$3,000,000 equivalent made prior to the date of the signing of the legal agreement but on or after February 1, 2015, in respect of eligible expenditures may be financed from the GEF Grant, provided that the procurement requirement and procedures have been met. The table below lists the contracts to be procured under retroactive financing.

Table: Contracts to be procured under Retroactive Financing

Reference Number	Description	Estimated Costs	Procurement Method	Review by Bank (Prior / Post)
1	Improving the implementation of fiscal incentives to pilot energy conservation and emission reduction cities	280,000	CQS	Prior
2	Recommending MRV principles	300,000	CQS	Post
3	Setting EE target of 13th FYP and preparing EE 13th FYP	300,000	CQS	Prior
4	Allocating targets to provinces	300,000	CQS	Post
5	Improving the current monitoring and evaluation system	100,000	CQS	Post
6	Preparing 13th FYP energy	100,000	CQS	Post

	efficiency action plan			
7	Design of 13th FYP energy efficiency priority programs	150,000	CQS	Post
8	Amendment of Energy Conservation Law	150,000	CQS	Post
9	Rolling out national online monitoring platform	280,000	CQS	Post
10	Designing and developing of data evaluation system for online monitoring platform	120,000	CQS	Post
11	Executive Director	42,000	IC	Prior
12	Project Manager (1)	30,000	IC	Prior
13	Project Procurement Manager	30,000	IC	Prior
14	Financial Manager	30,000	IC	Prior
15	Secretary	30,000	IC	Prior
	Total	2,242,000		

Environmental and Social (including safeguards)

25. The proposed project consists of improving fiscal incentives for energy savings, and supporting development and implementation of priority EE programs in China. The project does not include any physical works, nor will it result in direct physical investments. There are no adverse environmental and social impacts envisaged, therefore, the project is classified as Category C, no further EA action is required as per provisions of OP4.01.

26. The proposed project only involve policy and institutional level activities, and does not include any physical activities that may have social safeguards impacts. Therefore, no social safeguards policy is triggered.

27. The project will benefit women and men equally. During consultation and assessment with beneficiaries, surveys and interviews will be designed with gender sensitivity to ensure that women are given equal opportunities.

Monitoring & Evaluation

28. Annex 1 provides a detailed description of the performance indicators to be tracked under the project, and specifies the source and schedule for data collection. The PMO will be responsible for the overall M&E system, including regular data collection to assess progress towards achieving results. It will furnish to the Bank semi-annual progress reports on project implementation by February 15 and August 15 of each year, starting with February 15, 2016. In addition, it will prepare a mid-term review report by June 30, 2018. Based on the recommendations of these reports and the Bank's reviews and comments thereon, the PMO will take actions, satisfactory to the Bank, to address any emerging issues in order to meet the targets set in the results framework.

Role of Partners (if applicable)

29. There are many bilateral and multilateral donors active in energy conservation and climate change in China. The project will coordinate with and complement the existing related EE and climate change initiatives. Many of the EE and climate change initiatives are supported by the World Bank and GEF, notably the China Energy Efficiency Financing Project and the Partnership for Market Readiness initiative. The Bank team will periodically organize donor coordination meetings during project preparation and implementation to coordinate with the key active donors and programs in the EE and climate change field in China.

Annex 4: Incremental Cost Analysis

China: Developing Market-based Energy Efficiency Program

1. While China has made considerable progress in energy conservation, it faces substantial challenges in meeting its ambitious 12th FYP EE targets and continuing with the 13th FYP EE targets, particularly the expected total energy consumption cap in the 13th FYP. The command-and-control type of administrative measures has reached its limits and the government intends to increase the use of the market-based mechanism to unleash more energy saving potentials in the economy. In response to the government request, the project is designed to introduce and establish the market-based mechanism for energy savings. The core concept of the project design is to commodify energy savings to make them valuable products, thus to incentivize the efforts to make more energy savings.
2. International assistance from World Bank/GEF has been critical to support Chinese government's efforts on energy conservation, particularly on introducing market-based mechanism by learning from international best practices and customizing them according China's conditions. This project is a continuation of this partnership to address the new challenges and barriers facing Chinese government on achieving its ambitious EE targets.
3. **Baseline:** During the 11th FYP, the GoC has relied on regulatory and administrative measures and provided financial incentives to promote energy efficiency to achieve the energy intensity reduction target. While these measures were successful and effective, many low-cost EE potentials have largely been harvested during the 11th FYP and energy efficiency investments per unit of energy savings have been increasing such that enterprises no longer have sufficient incentives to improve energy efficiency. Therefore, achieving the 12th and 13th FYP targets is relying on increasing the use of market-based mechanisms to allow more enterprises to take actions on energy efficiency. Finally, the development of the 13th FYP faces a tremendous challenge to cap the total energy consumption, thereby, limiting the incremental energy growth.
4. In this context in particular, MOF is providing 400-600 million RMB per year for three years to award each of the thirty pilot Energy Conservation and Emission Reduction cities provided they can reach higher targets of energy intensity reduction, carbon intensity reduction, and emission reduction than those required by the 12th FYP. Currently, some of these pilot cities cannot achieve their intended higher targets due to a number of barriers addressed by the project.
5. **Alternative:** The GEF project is designed to support development and implementation of China's priority energy efficiency programs, with a focus on improving energy savings measurement and verification system and developing market-based mechanisms. The approach is to commodify energy savings through establishing a credible M&V system to certify energy savings and developing a trading scheme for certified energy savings. Such a market-base mechanism will incentivize market participants to make more energy savings thus contributing to the government's ambitious EE targets.
6. The key barriers and challenges that China is currently facing and the project will address include the following:

7. 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.

8. 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 and pilot project-based EE trading, 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 and undertake future enterprise-based EE trading. 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.

9. 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 for example, 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.

10. Lack of transparent and credible accreditation process and institutional framework for third-party verifiers. Under the energy saving reward program, 26 third-party verification agencies were selected and approved by the MOF and 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, accreditation processes, and credible institutional framework need to be established for both third-party verification professionals and agencies.

11. *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.

12. *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 in five cities and two provinces.

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

14. In addition to these policy support interventions, institutional strengthening, and technical assistance activities at national level, GEF support will also be used to provide technical assistance and capacity building to 3-4 selected pilot Energy Conservation and Emission Reduction cities to support them developing and piloting innovative market-based mechanisms such as EE trading and improving M&V system. These efforts are intended to help them achieve higher targets of energy intensity reduction, carbon intensity reduction, and emission reduction than the national targets.

15. **Increment:** The incremental costs of the EE program is estimated at \$17.8 million from the GEF contribution, incremental to the baseline funding of US\$104 million from the central and local governments, enterprises, and third-party verifiers. The total costs of the program are estimated at US\$121.8 million, of which US\$17.8 million are considered incremental.

16. **Domestic Benefits:** In addition to the benefits of meeting the government's EE targets, the project will assist the Government of China to develop market-based fiscal incentives for EE

during the 13th FYP which aims to improve the cost-effectiveness of the current government-financed EE incentives fund. It will assist key energy-consuming enterprises meeting their EE targets in a more cost-effective way, incentivize enterprises to make more energy savings to not only save energy costs, but also gain additional revenue through selling extra energy savings, and provide more EE businesses for ESCOs, and other service suppliers. More energy savings also mean conserved scarce natural resources, enhanced energy security, and improved air quality and better health for Chinese residents.

17. **Global Environmental Benefits:** The long-term Global Environmental Benefits expected to accrue from the project stem firstly from the support that the project offers to China's development and implementation of market-based mechanisms for energy savings and GHG reduction; these benefits are potentially very large, if difficult to estimate reliably and credibly at this point. Whilst still an estimate, one can nevertheless more reliably roughly quantify the direct benefits that would accrue from the support provided to the project's pilot cities, which represents a conservative estimate of the overall impact of the project. Based on the data submitted from the pilot Energy Conservation and Emission Reduction cities under the MOF fiscal incentive program, and assuming three such pilot cities are selected, they would achieve an estimated additional 3.6 million tons of coal equivalent of energy savings beyond meeting the 12th FYP targets. With an assumed emission factor of 2.44 ton CO₂/tce, this translates to 8.8 million tons of CO₂. Over the 10 year lifetime of the investments, the total lifetime avoided CO₂ emissions attributable to the GEF direct global environmental benefits at the end of project implementation are estimated at 88 million tons of CO₂. The undiscounted GEF incremental cost is about US\$0.2/ton-CO₂, compared to the current price of about US\$4/ton-CO₂ of certified emission reduction (CER) in the European Union. Assuming the demonstrated market-based measures are replicated in all 30 cities under the current pilot program, the GEF indirect global environmental benefits could be up to 880 million tons of CO₂ emission reductions. The 13th FYP is expected to have even tougher EE targets. Without market-base measures such as EE trading, the priority enterprises are expected to have a larger gap to meet their targets. Therefore, the real project's global environment benefits are likely to be greater as the project would help avoid a bigger shortfall against more ambitious future targets.