II. Sectoral and Institutional Context

Local government’s commitment and vision: Shanghai municipal and Changning district governments requested Bank support to benefit from international knowledge and best practices. They seek to combine a Bank loan to finance low-carbon investments and a GEF grant for policy advice and business development studies to make the Changning District and Shanghai leaders in designing novel and efficient ways to achieve their carbon intensity reduction targets. Shanghai municipal and Changning district governments are firmly committed to the transition to a low-carbon city, and achieving the carbon intensity reduction targets is one of the highest priorities in their 12th Five-Year Plan (FYP). Shanghai municipal government targets a reduction in carbon intensity and energy intensity by 19 and 18 percent respectively, and a cap on total energy consumption by the end of the 12th FYP period. The Changning district government targets a reduction in energy intensity by 17 percent, and a cap on total energy consumption by the end of the 12th FYP, which would cut the annual growth of total energy consumption by half compared to the current levels. To achieve these targets, both municipal and district governments have allocated dedicated funds to support energy conservation and emission reduction. Shanghai is also piloting carbon cap and trade scheme under NDRC’s pilot programs in five cities and two provinces.

In particular, the Changning District government has presented an articulated vision aimed at transforming Changning into a leading low-carbon district in Shanghai and the country, anchoring green growth as the engine for competitiveness of the district. The Changning government has specifically developed a low-carbon district 12th FYP that focuses on improving energy efficiency of buildings, shifting to low-carbon economic structure and energy mix, and adopting innovative mechanisms in multiple sectors. It is also willing to pilot bold policies and incentives that are not yet implemented at the municipal and national levels during the 12th FYP. This proposed project is an important and integral part of the district government’s emission reduction program. Benefiting from international experience through this project, Changning government plans to accelerate the speed and enhance the quality and success of this initiative.

Identifying cost-effective abatement options: Prior to the project identification mission, the Changning district government entrusted a Shanghai energy conservation institution, supported by the Bank team and assisted by an international firm, to conduct a comprehensive survey of buildings in the Hongqiao demonstration area in the Changning district, and develop CO2 abatement cost curves to identify abatement potentials,
In addition, financial institutions are usually reluctant to finance building EE investments, because of (a) the small size of each project (the Changning District was prepared for district government’s consideration, and is expected to be in effect by the end of 2012. mandates for building retrofit will take time. In the short term, the Changning district government is willing to provide additional funding to achieve to price signals. Regulations tend to be more effective. However, bringing about major changes in national building codes and introducing Adoption of building EE measures requires decisions and actions by many decentralized players, as a result, energy demand is less responsive to the baseline buildings in 1980s, while Shanghai’s building codes are a step ahead of national codes requiring 65 percent of energy savings. At present, national and municipal governments have mandatory building codes for new buildings, but not for building retrofit. In addition, current building codes in China need improvements. The national building codes require new buildings to meet 50 percent of energy savings compared to the baseline buildings in 1980s, while Shanghai’s building codes are a step ahead of national codes requiring 65 percent of energy savings. These buildings codes focus on input-based individual technology requirements rather than performance-based energy consumption (e.g. in kWh/m²). They, therefore, are not directly linked to total energy savings and emission reduction targets.

Building EE projects, in particular the envisaged investments to achieve Changning’s ambitious energy saving targets, usually have a long payback period (e.g. 8-10 years), while commercial investors are normally only willing to invest in projects with a 3-5 year payback. The current subsidies provided by the national and municipal governments seem insufficient to induce investments in this market on a large scale. Currently, the national and municipal governments provide a subsidy of 60 Yuan/m² (or $9.5/m²) for building retrofit achieving national building codes, or 500 Yuan/tce (or $80/tce) energy savings for ESCOs who invest in EE measures (both industrial and building EE), equivalent to only 3 percent of the capital investment of an average building retrofit investment. For renewable energy in buildings, the national and municipal go vernments offer a subsidy of 14 Yuan/Wp (or $2.2/Wp) for rooftop solar PV, and mandates all buildings with less than six stories to install solar water heaters. Additional incentives are therefore critical to improve the financial viability of building retrofit investments and increase market scope to achieve higher emission reductions.

To address these barriers to regulations and incentives for building retrofit, the Bank team, in collaboration with the Energy Foundation, has been supporting local counterparts to undertake an upstream analytical work to (a) develop performance-based building energy efficiency benchmarks in kWh/m², which could be used to mandate building retrofit; (b) recommend policy frameworks of potential mandatory measures and additional financial incentives beyond existing national and municipal government policies that could be piloted under this project by the municipal and district governments; and (c) identify a number of viable business models to bundle small-scale building retrofit projects. This is the first attempt to tackle building retrofit in China. If successful, this will have a wide replication potential nationwide. Adoption of building EE measures requires decisions and actions by many decentralized players, as a result, energy demand is less responsive to price signals. Regulations tend to be more effective. However, bringing about major changes in national building codes and introducing mandates for building retrofit will take time. In the short term, the Changning district government is willing to provide additional funding to achieve its low-carbon vision as a leader of the low-carbon city paradigm. To this end, a draft decree to provide additional incentives for building retrofit in Changning District was prepared for district government’s consideration, and is expected to be in effect by the end of 2012.

In addition, financial institutions are usually reluctant to finance building EE investments, because of (a) the small size of each project (the
average size of a typical building retrofit project usually ranges between US$500,000 and US$1,000,000) and high transaction costs; (b) high credit risks of energy service companies (ESCOs), who typically implement building retrofit projects but normally do not have major assets to offer as collaterals; and (c) the perceived high technical risks and concerns about materialization of projected energy savings.

Currently, building retrofit in China is linked to demonstration projects with government budget. The proposed project intends to jump start the building retrofit market and scale up low-carbon investments in buildings through commercial bank financing.

In addition to commercial buildings, this project will also support retrofit of government buildings, as the government should lead by example. In Changning, government office buildings, schools, and hospitals offer a high, captive and easier to tap saving potential.

Pushing envelope for new buildings: While new buildings have to meet mandatory municipal building codes, the proposed project intends to push the envelope further to achieve deeper emission reductions and demonstrate the technical feasibility of future generation of low-emission buildings. To this end, the Bank team, in collaboration with the Energy Foundation, has been supporting local counterparts to undertake an upstream analytical study to confirm the technical feasibility and estimate the incremental costs of low-emission buildings with higher energy efficiency and lower emissions than the municipal building codes and near zero-emission buildings in Shanghai. The study concluded that low-emission buildings achieving 70 percent energy savings (compared to the 65 percent municipal building codes) are financially viable with existing government subsidies, while near zero-emission buildings are technically feasible.

### III. Project Development Objectives

The higher-level global environment objective of the project is to support Shanghai’s low-carbon city development by promoting green energy schemes, with a focus on Changning district. The project objectives are to pilot green energy schemes and scale up low-carbon investments in buildings in Shanghai, with a focus on Changning district.

### IV. Project Description

#### Component Name

- Component 1. Technical Assistance and Near Zero-Emission Building
- Component 2. Low-Carbon Investments

### V. Financing (in USD Million)

<table>
<thead>
<tr>
<th>For Loans/Credits/Others</th>
<th>Amount</th>
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<tbody>
<tr>
<td>BORROWER/RECIPIENT</td>
<td>151.66</td>
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<tr>
<td>International Bank for Reconstruction and Development</td>
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<tr>
<td>Global Environment Facility (GEF)</td>
<td>4.35</td>
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<tr>
<td>Total</td>
<td>256.00</td>
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### VI. Implementation

#### A. Institutional and Implementation Arrangements

**Project Steering Committee and Project Executive Committee:** A Project Steering Committee will be set up to coordinate and replicate policies at the Municipality level. A Project Executive Committee will be established to coordinate the district level government agencies and supervise day-to-day project implementation.

**Project Management Office:** The PMO has been established and is functional to implement the GEF Project Preparation Grant (PPG), with key staff on board (Director, Deputy Director, technical, procurement, financial management, and safeguards staff). The PMO will be responsible for implementing the GEF component of the Project.

Regarding the IBRD loan, the PMO will (a) assist the participating banks in identifying sub-projects; (b) review and provide no-objection to the technical aspects of sub-projects to ensure that the sub-loans follow the Operational Manual and achieve the low-carbon objective in Changning district; (c) conduct environmental and social safeguard due diligence and supervision of sub-projects; and (d) verify energy savings of sub-projects. The Changning on-line energy monitoring platform for building energy consumption provides an innovative tool for the district government/PMO to measure and verify energy savings of the IBRD investments.

**Participating Banks:** The local government compared a few commercial banks operating in Shanghai, and selected SPD Bank and BOS as the implementing agencies for the following reasons: (a) both banks are committed to green credit businesses, have previous experience with building EE and ESCO investments, and have a strong focus on SME finance; and (b) the Shanghai municipal government is the largest shareholder of SPD Bank and BOS. They both have a large network of customers in Shanghai and Changning district.

The participating banks—SPD Bank and BOS—are the implementing agencies for the IBRD loan, responsible for (a) generating a lending pipeline; (b) appraising and approving technical, financial, procurement, and financial management aspects of sub-projects; (c) supervising and monitoring sub-borrowers and sub-projects; and (d) fully disbursing IBRD funds and counterpart co-funding, according to the agreed-upon Operational Manual. The participating banks will bear 100 percent of default risks. They shall follow government policies and World Bank rules and procedures as detailed in the Operational Manual.

The district government will on-lend US$40 million IBRD loan to each of the participating banks, and leave US$20 million for the two PFIs to compete for in the market on a first come first serve basis. The PFI needs to fully disburse the US$40 million allocation first, before they can start to tap the remaining US$20 million to finance eligible sub-projects following the Operational Manual.
SPD Bank and BOS have agreed to put in place dedicated teams at headquarter, branch, and sub-branch levels, and develop internal implementation rules and regulations for this project, prior to project effectiveness. During the entire project implementation period, SPD Bank and BOS shall maintain these dedicated teams with adequate staff and resources and apply the Operational Manual satisfactory to the Bank. The detailed implementation arrangement is provided in Annex 3.

Sub-borrowers: The sub-borrowers would be eligible ESCOs (including leasing companies), building owners, building developers, property management companies, EE/RE equipment vendors, government agencies, government end users, and distributed generation operators for low-carbon investment subprojects. Funding from the government and GEF will assist potential sub-borrowers in undertaking energy auditing, diagnostic and feasibility studies, before they apply for loans from the PFIs. Shanghai has about 200 registered ESCOs on the municipal DRC’s list of qualified ESCOs eligible for receiving government subsidies.

B. Results Monitoring and Evaluation

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 from Shanghai Pudong Development Bank and Bank of Shanghai and reporting on the impact and results of the project.

C. Sustainability

The likelihood of sustainability of the project is high, given the high commitment of Shanghai Municipality and Changning District to achieve their low-carbon development goals which are also strongly supported by the national leadership for reducing the country’s energy intensity and carbon intensity. The financial intermediary approach and GEF support to develop policies, business models, and financing mechanisms will also ensure project sustainability.

VII. Safeguard Policies (including public consultation)

<table>
<thead>
<tr>
<th>Safeguard Policies Triggered by the Project</th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>Environmental Assessment OP/BP 4.01</td>
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<td>Natural Habitats OP/BP 4.04</td>
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<td>Involuntary Resettlement OP/BP 4.12</td>
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<td>Safety of Dams OP/BP 4.37</td>
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<tr>
<td>Projects in Disputed Areas OP/BP 7.60</td>
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</tr>
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</table>

VIII. Contact point

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