I. Introduction and Context

Country Context

The main objective of the 12th Five-Year Plan (FYP, 2011-2015) of the Government of China (GOC) is to accelerate the transformation of the mode of economic development. This is supported by five guiding principles, including adherence to building a resources-efficient and environmentally friendly society. Saving energy and reducing emissions remain key binding commitments in the 12th FYP. The national target for energy efficiency (EE) improvement requires reduction of energy consumption per unit GDP by 16 percent by 2015, compared with the level in 2010. For the first time in GOC’s planning history the 12th FYP also includes a binding target for reduction of carbon dioxide (CO2) emission per unit GDP by 17 percent by 2015, compared with that of the level in 2010.

As the engines of economic growth, cities and urban areas will be the primary driver of the economic development transformation and a main contributor to achieving the EE improvement and CO2 emission reduction targets. China is in a quick urbanization process and it is expected to add 10 to 15 million persons per year to its cities between 2010 and 2030. In addition to continued economic growth, this drives demand for residential and commercial buildings and the energy that supplies them. It is estimated that about sixty percent of the residential and commercial building stock in Chinese cities as of 2006 had been built since 1996. Another sixty percent of the residential and commercial building stock in Chinese cities by 2030 will have been built since 2006. Beijing strives to be a leader of Chinese cities in transforming the mode of economic growth and promoting resource-efficient growth. Its 12th FYP aims to strengthen or establish Beijing’s leadership in cultural prosperity, science and technology, and green city. Following a highly successful effort in the 11th FYP period, Beijing Municipal Government (BMG) has set more demanding targets than those of the GOC: reducing GDP energy intensity by 17 percent and GDP CO2 intensity by 18 percent by 2015. Beijing achieved a 26.5 percent reduction in GDP energy intensity from 2006 to 2010, the deepest reduction among all provinces, in large part due to economic structural adjustment.

Sectoral and Institutional Context
Scaling up investments in EE and renewable energy (RE) is a key national strategy to transform China’s economic development into clean and resource-efficient growth. New efforts and investments are being mobilized to scale up EE and RE supplies in cities. China plans to increase the installed capacity of rooftop photovoltaic (PV) systems from about 400 MW in 2010 to 3,500 MW in 2015. This is being supported by central government subsidies (9 yuan/W) through the “Golden Sun” program and by additional local government subsidies (BMG’s subsidy is 3 yuan/W). The estimated installed costs of rooftop PV systems range from 15 to 20 yuan/W in Beijing. BMG’s “Sunshine Schools” program, which will install about 100 MW rooftop PV systems in municipal public schools and colleges, is the largest of such initiatives in China so far. There are no tried and tested domestic implementation and operational models to follow. As a demonstration, if proven commercially successful, the project would provide valuable experience (technical feasibility, economic viability, safeguards, and project management) for developing similar schemes in many northern cities with good solar resources.

The GOC also is actively supporting EE investments in the public sector by encouraging the use of energy savings performance contracts (ESPCs). The State Council’s April 2010 policy statement on ESPC includes an explicit statement that public institutions can pay ESPCs from energy cost provisions in their fiscal budgets. Following this guidance in its Interim Measures for Management Funds for Fiscal Awards to Energy Performance Contracted Projects of November 2010, BMG included specific provisions allowing public institutions to retain their portion of energy cost savings delivered from ESPCs and use these funds according to an overall plan. The BMG’s regulation also states that entities may retain all of the annual energy cost savings achieved from ESPCs for three years after the energy service provides have been fully paid and contracts concluded. However, there is no practical experience with these new policies and incentive policies have been introduced to stimulate interest. Under a new incentive program the central government will provide a subsidy of 240 yuan per annual ton of coal equivalent (tce) saved to eligible ESPCs. BMG also provides 260 yuan/annual tce additional subsidy. The costs of energy savings in the public sector were reported to be around 5000 yuan/annual tce or more.

Despite significant public capital subsidies scaling up commercial investments in rooftop PV systems and EE in the public sector still face significant challenges. In addition to high capital cost and a lack of experience in operating large scale rooftop PV systems, a main policy barrier to rooftop PV systems is the restrictions on two-way metering and net metering, which enables PV system owners to minimize electricity cost by receiving credits at retail prices for surplus electricity generation sent back to the grid. Initial estimates indicated that at an installed cost of 18 yuan/w and taking into account of the capital subsidies, the payback time is about 25 yrs relying solely on regular school consumption. The payback time would be 17 yrs with two-way metering and 15 yrs with net metering. Recent policy development indicates that two-way metering is likely to be permitted. But net metering still remains a divisive issue. Using ESPC for public sector EE projects faces known but persistent challenges associated with promoting energy efficiency, e.g., lack of financing, expertise in preparing well defined ESPCs, small disaggregated investments, etc., and public sector-specific challenges associated with, such as lack of experience among building managers with ESPCs for building retrofits and the execution of new policies to promote them.

Relationship to CAS

The proposed operation is in line with the 12th Five Year Program’s objective relating to EE and emissions reduction. The objective of the proposed project is fully consistent with the Country Partnership Strategy (CPS) for 2006 to 2010 (Report No. 35435-CN), approved by the Board on May 23, 2006. It directly supports one of five pillars of the Country Partnership Strategy for China: managing resource scarcity and environmental challenges. This pillar supports China’s effort to meet its ambitious goals for creating a more resource-efficient, less polluting society. It also supports China’s undertaking to improve EE, to expand use of renewable energy and to address climate change. The project is also expected to be consistent with the new CPS for 2011-2015, currently being prepared in alignment with China’s 12th FYP.

II. Proposed Development Objective(s)

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The PDO for the proposed project is to scale up rooftop PV systems and EE investments in the public sector in Beijing. This will be achieved through supporting a large scale roof-top PV program among about 1000 Beijing public schools and colleges using market-based business model, pilots in two-way metering and possibly net metering in a few selected schools for each option, and an EE investment program in the public sector using the ESPC approach.

Key Results

The proposed project will support BMG in scaling up the utilization of renewable energy and achieving its targets for reducing CO2 emissions and improving energy efficiency (EE) in the 12th FYP period and beyond. The proposed KPIs are total installed rooftop PV systems (MW), annual electricity generation (MWh/yr), and avoided CO2 emissions through the Sunshine Schools program and annual energy-savings (tce/yr) and avoided CO2 emissions through the public sector EE program. The task team also considers developing this project into a programmatic CDM with the support from carbon finance team within the Bank.

III. Preliminary Description

Concept Description
The proposed Project will comprise three components:

Component 1: Sunshine Schools Program (proposed IBRD financing $95 million). The total investment cost of the component is about 1.8 billion yuan (based on an estimated installed cost of 18 yuan/W), or about US$283.5 million ($1 = 6.35 yuan) for a total installed capacity of 100 MW. The PV systems will be installed in about 1000 public schools and in a number of municipal budget-financed colleges. Individual PV systems are expected to range from 50 kW to 200 kW. Central and municipal government subsidies will finance about two thirds of the estimated investment. IBRD loan is proposed to cover the remainder. The Sunshine Schools program also includes pilots on two-way metering and possibly net metering in a few selected schools, related technical studies, and educational activities on sustainable energy. These will be covered under a separate component (Policy Support and Capacity Building) for the purpose of streamlining implementation arrangements for the proposed project.

Under the current proposal, the schools or colleges hosting the PV systems will pay directly to Yuanshen - an energy service company who is assigned by BMG as the project entity, through an escrow account for the electricity consumed at the retail prices which the schools pay to the grid company (currently at 0.485 yuan/kWh). A separate meter will be installed for metering the electricity from the PV system and the data will be collected and monitored by a central monitoring system.

Component 2: Public Sector EE Program (proposed IBRD financing $20 million). The total investment cost of the component will be determined during preparation. The main investment activity currently under consideration is an EE renovation program among BMG-funded public entities, covering heating, ventilation, and air conditioning systems, lighting, and building envelope. Initial survey done by Beijing Energy Conservation and Environmental Protection Center indicated an EE investment portfolio of about 150 million yuan (about $24 million) among 28 BMG-funded colleges. Other investment proposals under consideration include EE retrofits for buildings and facilities managed by the bureaus of sports, culture, and civil affairs, totaling about 210 million yuan (about $33 million). The potential size of EE investment in Beijing municipal entities is expected to be significantly larger. It is expected that ESPC approach will be used for this component.

Component 3: Policy Support and Capacity Building (proposed IBRD financing $5 million). Proposed activities include (1) supporting pilots of two-metering and possibly net metering and related technical studies; (2) expanding and upgrading the on-line monitoring platform for PV systems installed by the Sunshine Schools program; (3) supporting the establishment of an sustainable energy education platform in public schools, including curriculum development, demonstration laboratories for hands-on learning and experiment, and training of school technical managers for energy management based on international best practices and experiences; (4) improving energy management in public entities (e.g., implementation of energy monitoring and targeting); and (5) project management and supervision, including monitoring and evaluation.

IV. Safeguard Policies that might apply

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VI. Contact point

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