1. Key Development Issues and Rationale for Bank Involvement

Urban residential space heating contributes significantly to energy waste in China and is an obstacle to greater energy sector market and environmental reforms. The urban heating sector accounts for about 10 percent of China’s total commercial energy use and its share rises to about 25% in China’s cold regions, where temperatures fall below 5°C for over 90 days. The heating sector currently provides no incentives for consumers to respond to market-based energy costs: China’s centralized heating systems are based on standards of Soviet technology that do not allow consumers to control their heating. There are practically no meter-based systems and billing is based on a flat per square meter price. Moreover, most individual household heat bills are paid by their employers, representing one of the last vestiges of the old-style welfare system. China’s building construction boom is overwhelming efforts to enforce its building energy efficiency standards and there are strong incentives to maintain existing, easily understood building designs, materials and practices among the suppliers and contractors in the housing development industry. This risks locking in lax energy use parameters, and high heating bills for consumers, in China’s urban residential building stock, which is expected to triple over the next 20 years. Due to its major cost advantage, and shortages of alternatives, coal is expected to be the predominant fuel for centralized urban heating systems for the foreseeable future. The coal-fired central heating plants are already a primary source of air pollution in China’s cold weather cities. The situation will rapidly get worse under present conditions without major efforts in improving energy efficiency of urban space heating.

The need to improve urban space heating has been discussed in China for years. Recently China’s leadership has made it clear reforms must proceed and the focus has shifted on how to implement them. The World Bank’s initial study work and dialogue with Chinese officials concluded the most effective way to implement urban space heating reform in China is by having government and corporate actors in the heating supply and housing development industries work
together. Thus far, however, efforts at the central and local government levels have dealt separately with issues relating to supply of heating and with measures to improve end use. The results of this piecemeal approach have been limited. An integrated, “two handed” approach is necessary, but there is no experience with implementing its interrelated policy changes in China. On one hand, the creation of a market mechanism is needed through heat reform and heat system modernization so consumers pay for actual consumption (i.e. by passing responsibility of payment to households from enterprises, metering consumption and introducing consumption-based billing) and to enable consumers to control how much heat they consume (i.e. by using in new facilities variable-flow, two-pipe heat supply systems and manual valves or thermostatic radiator valves in radiator systems). The other hand of the two handed approach requires major improvements in urban residential building energy efficiency, which could save 50% or more of heat energy. These sustainable improvements in building energy efficiency require widespread adoption of more energy efficient designs, materials/components and construction methods – often called building energy efficiency market transformation.

There are complex and interwoven barriers that need to be removed to achieve efficiency in heat supply and its use in China. Major organizational and institutional challenges need to be overcome to implement reforms within each affected industry (i.e. introduction of pricing systems, metering systems, billing practices, new management systems to handle demand-driven heating systems, incorporating building energy efficiency enforcement into design and construction regulation systems at the local levels, developing a credible market for energy efficient building materials and housing designs). Even with the two handed approach, there is the challenge of integrating efforts across industry and government – the heat supply industry, the housing development industry and the government units responsible for their regulation need to work closely together to optimize and synchronize approaches. The lack of experience and knowledge of applying international experience in energy efficiency in heat supply and residential buildings to Chinese conditions is an additional barrier. Integrated heat reform, heat modernization and building energy efficiency improvements need to overcome the facts that (a) there is virtually no experience in China with consumption based billing and operating demand-based heating systems, (b) performance of new building materials is unclear, and (c) consumer benefits of heat reform and building energy efficiency improvements are unproven.

Many of these barriers, and especially the organizational and institutional ones, can only be overcome by the Government, working together with industry and housing developers, and over a number of years. This proposed GEF project will provide the core mechanism for providing comprehensive and consistent support over the required multi-year period through pilot city efforts to demonstrate the feasibility and benefits of the two handed approach, and subsequently through a national replication program. It will be complemented by and will be integrated with a closely-related new French GEF project with the city of Harbin. The French GEF project will help improve energy efficiency at the building level in that city, and this project will create the supportive policy framework and an efficient heat supply system.
2. **Proposed Objective(s)**

The objective of the proposed project is to achieve substantial, sustained and growing increases in energy efficiency in residential buildings and the heating systems which supply them in China’s cold and severe cold regions. The project will achieve this by leveraging corporate resources and working in close collaboration with the Chinese Government to reduce energy waste in buildings and heating systems through a combination of: (i) improvements in the buildings themselves, through improved design and use of improved insulation and other energy efficiency measures; (ii) reform of heat pricing and billing systems, through implementation of heat metering, cost-based pricing and consumption-based billing; and (iii) improvements in the heat supply systems to enable consumer control, demand-based dispatch and more commercial operation. The integration of these three elements has not yet been implemented in China, but is considered critical to removing the technical, institutional and organizational barriers to the implementation of the Government’s dual policy agenda in heat reform and building energy efficiency regulation.

3. **Preliminary Description**

The proposed project comprises three mutually reinforcing components: (a) a large, integrated building energy efficiency and heat reform and supply demonstration project in Tannin Municipality; (b) national-level coordination and policy support; and (c) phased-in building energy efficiency and heat reform programs in 4-6 additional northern Chinese cities, to be developed as project implementation of the first two components proceeds.

Two key outputs of the project include: (a) the development and implementation of city wide integrated heat reform and building energy efficiency programs in Tannin and 4-6 other cities; and (b) the dissemination of the results and benefits of these programs across northern China. These city-wide programs will combine heat reform (i.e. consumption-based billing, pricing reform and transfer of heating payment responsibility to households) and building energy efficiency measures (i.e. energy efficient building construction/retrofitting, installation of meters, strengthened enforcement of building energy efficiency standards, energy efficient heating supply construction/rehabilitation). Implemented through the National Component, replication of the results and benefits of the city-wide programs will be supported by a implementation of: (a) comprehensive monitoring and evaluation program; and (b) dissemination to other municipalities as part of the Government’s overall national reform effort.

4. **Safeguard Policies That Might Apply**

The project is assigned an environmental category B. The environmental impacts of the project are highly positive, as project investments will result in large-scale energy savings, and associated local and global emissions reductions. Due diligence reports for housing developments incorporating the energy efficiency innovations of the project will be prepared and reviewed, to ensure that local social and environmental regulations are properly adhered to. Since most investments will not be identified prior to implementation, an environmental
screening framework will be used to identify and address any safeguard issues ensuring compliance with Chinese regulations will be required for all subprojects.

5. Tentative Financing

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6. Contact Point

Contact: Robert P. Taylor  
Title: Lead Energy Specialist  
Tel: (202) 458-2446  
Fax: (202) 522-1648  
Email: Rtaylor1@worldbank.org