

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

Report No.: PIDA33687

Project Name	Hebei Clean Heating Project (P148599)
Region	EAST ASIA AND PACIFIC
Country	China
Sector(s)	Energy efficiency in Heat and Power (100%)
Theme(s)	Pollution management and environmental health (40%), Climate change (10%), Other urban development (50%)
Lending Instrument	Investment Project Financing
Project ID	P148599
Borrower(s)	People's Republic of China
Implementing Agency	Foreign Debt Management Center, Hebei Provincial Department of Finance
Environmental Category	A-Full Assessment
Date PID Prepared/Updated	13-Oct-2015
Date PID Approved/Disclosed	13-Oct-2015
Estimated Date of Appraisal Completion	13-Oct-2015
Estimated Date of Board Approval	25-Feb-2016
Appraisal Review Decision (from Decision Note)	<p>The Decision Meeting took place on September 21.</p> <p>The main decisions taken were:</p> <p>(a) The chair authorized the team to appraise the project subject to clearance of the safeguard documents.</p> <p>(b) The meeting discussed the risk rating of the project and agreed to rate the project Substantial.</p>

I. Project Context

Country Context

China has achieved rapid economic growth in recent decades, however, many imbalances remain. In the past decade, GDP grew by 9.9 percent per annum with broadly effective macroeconomic management. Inflation has been kept broadly under control. China's real economy was affected by the global financial crisis from 2008 in terms of trade flows and FDI, however, a forceful fiscal and monetary stimulus helped keep China's growth rate at a high level. Per capita incomes have risen rapidly in urban and rural areas, and dozens of millions of people have been lifted out of poverty. At the same time, approximately 200 million people still live below the World Bank poverty line,

with China having the second-largest number of poor among all countries (after India). In addition, some economic and social imbalances have emerged, in particular:

- widening disparities in regional development and incomes, between urban and rural areas, and between coastal and inland provinces; and
- growing local and global environmental challenges, and high vulnerability to the adverse impacts of climate change.

China's economic growth continues to moderate, signaling what President Xi has called the "new normal"—a growth trajectory that is slower but more sustainable. In 2014, gross domestic product (GDP) expanded by 7.4 percent, within the government's indicative growth target of about 7.5 percent for the year, but sharply slower than the 10 percent average annual growth rate that China experienced over the past three decades. An orderly correction in real estate—reflecting policy efforts to reduce supply mismatches and tighten nonbank credit—continues to weigh on economic activity. Ongoing adjustments in real estate, a buildup of excess capacity, and decelerating export growth are affecting industrial activity. In contrast, growth in services remains robust as the composition of growth has continued to improve. Government efforts to cut excess capacity in heavy industry, dampen unproductive risk-taking in shadow banking, and hardening budget constraints for local government will help make investment more efficient and realign growth over the medium term. In the short term, however, such reforms will depress economic activity. Official targets for 2015 signal a downward trajectory, with GDP targeted at about 7 percent, half a percentage point lower than in 2014.

Managing local government debt remains a challenge. While policy initiatives to refinance local government debt are targeted to address specific vulnerabilities, accommodating policies if not accompanied with structural reforms will make it more challenging to implement the policies necessary to shift growth to a more sustainable medium-term path.

Sectoral and institutional Context

China's energy sector faces three main challenges: energy security, environmental sustainability, and sector efficiency. By 2030, China is expected to import 75 percent of its oil and 50 percent of its natural gas, and become the world's largest oil importer. The country is heavily dependent on fossil fuels, with coal accounting for about 70 percent of primary energy consumption. As a result, 85 percent of CO₂ emissions come from energy. The 12th FYP (2011-2015) aims to reduce energy intensity by a further 16 percent. For the first time, it also set a target to reduce carbon intensity by 17 percent, intended to contribute to an initial overarching goal of reducing carbon intensity in the economy by 40 to 45 percent from 2005 to 2020. China also announced in November 2014 a target to peak greenhouse gas (GHG) emissions by around 2030, and to increase the share of non-fossil fuels in primary energy consumption to around 20 percent by 2030 compared to 9.8 percent in 2013. The 13th FYP (2016-2020) has not yet been issued, but is expected to be an extension of the Government's commitments on energy and carbon intensity. Many options are being discussed, including possible caps on the consumption of energy or coal, or overall carbon emissions.

Associated with these challenges is the need for China to develop greener approaches to urbanization. By 2030, China's cities are projected to add about 45 percent more residents (about 300 million), and about 60 percent more buildings (in square meters of floor area) compared with 2010. The energy needs of these citizens will need to be met through a series of coordinated actions—reducing demand as much as possible, using local clean energy sources where feasible,

importing cleaner energy from outside city boundaries, and making coal use cleaner where it cannot be avoided (see *Urban-China: Toward Efficient, Inclusive and Sustainable Urbanization*, World Bank and State Council Development Research Center, 2014).

Hebei Province (population 73 million, ranking 6th in population and 16th in GDP/capita in 2013) is facing a major challenge in mitigating the environmental impacts of its economic growth. Hebei Province is a key center for manufacturing, including energy intensive heavy industry, and is a key source for fine particulate air pollution which is known to have major impacts on public health. The province is located in a major airshed that also includes the provinces of Beijing and Tianjin and that is known collectively as the Jing-Jin-Ji region. Hebei accounts for about 80 percent of total primary fine Particulate Matter (PM2.5) in the Jing-Jin-Ji region. In 2010, the region emitted a total of 1.6 million tons of primary PM2.5, with 1.3 million tons from Hebei Province along. Industrial processes and the residential sector are the main sources of primary PM2.5 in the region, accounting for 54 and 29 percent of pollution contributions, respectively. Sulfur dioxide (SO2) and nitrogen oxide (NOx) are also major atmospheric emissions. Industrial boilers, industrial processes, the power sector, the residential sector, and the heating sector contribute 39, 19, 17, 15, and 8 percent of SO2 emissions, respectively. The transportation sector, industrial boilers, the power sector, heating and industrial processes are the main sources of NOx emissions, accounting for 28, 27, 24, 10 and 7 percent, respectively.

In line with its industrial development, Hebei Province is rapidly urbanizing. Currently the urbanization rate is 48.1 percent (including migrants), and is expected to reach 58 percent by 2020. Part of the urbanization is expected to be from the growth of smaller county towns, which would find their primary source of population growth from rural to urban migration. While there is high uncertainty with respect to the pace and location of this migration, some county towns are certainly expected to grow and present an alternative to larger cities, where the cost of living may be unaffordable for lower income groups.

The heating sector offers some of the most direct opportunities for improving environmental quality in northern cities, including in Hebei, but also faces major challenges in central heating supply sector reform. The Bank study *China: Enhancing the Institutional Model for District Heating Regulation - Outside Perspectives and Suggestions?* (2012) identified the following sector issues: (i) lack of consistency in regulation; (ii) lack of consistency in sector planning, high market fragmentation, and high variability in operator qualifications; (iii) potential improvement in economic regulation and pricing; (iv) underdeveloped consumer protection and social assistance; and (v) weak orientation towards energy efficiency.

District heating systems continue to be mostly fueled by coal. In more than 300 cities, where centralized heating in the winter is legally required, over 90 percent of the heat supply is fueled by coal. While the sector consumes only about 7.5 percent of coal [is this Hebei we're talking about?], it does so in a short period of time during the heating season (between 4-5 months), contributing to the carbon intensity of energy use in China's cold northern provinces. In earlier stages of Chinese urbanization, cities invested in small, coal-fired boilers to provide space heating to new urban areas. Over time, these dispersed systems were replaced with larger district heating systems supplied with larger coal-fired heat only boilers with improved emissions controls. As urban areas continued to expand, coal-fired boilers surrounded the city, with some smokestacks barely clearing apartment building rooftops. Relative to modern technologies, the initial district heating systems in northern cities are often highly inefficient and are usually lagging in pollution controls. As a result, ambient

PM2.5 concentrations of cities north of the Huai River (the traditional boundary line for mandatory provision of heating by local governments) were estimated to be about 55 percent higher between 1981 and 2000. More significantly, these northern cities were found to have average life expectancies about 5.5 years lower, compared to cities where heating is not legally required.

Recently, district heating systems supplied from Combined Heat and Power (CHP) Plants with stricter emission standards have been promoted by the central Government as cleaner and more efficient alternatives to earlier district heating models. Several thermal power plants are now being converted to CHP for this purpose. Some cities have secured natural gas to fully or partially replace coal for heating. More advanced cities are starting to optimize the energy mix for district heating systems by: (a) using CHP to provide base-load and gas-fired boilers, where gas is available, to provide peak-load heating in integrated systems; (b) using low temperature waste heat and water cooling systems from industry; (c) identifying distributed solutions, combining gas/renewable where feasible (ie, using thermal collectors for hot water preparation) and (d) strengthening demand-side measures through building energy management and consumption-based billing. However, consumers and heat suppliers have been slow in responding to market-based energy costs because heating, unlike water and electricity, is largely billed according to the floor area rather than the meter. Though changing, the sector remains a vestige of the welfare state in China.

As part of its Implementation Plan of the Action Plan for the Prevention of Air Pollution in Hebei? (September 2013), Hebei Province has banned the construction of coal-fired heat only boilers (HOB) for district heating. Alternatives, including CHP-based district heating systems, are largely left up to cities to identify and develop with little support from the province. Many new and densifying urban areas in county towns also have no experience in developing district heating networks because they did not need them before. Some have turned to local industries to supply and finance waste-heat based systems, but the local industries also lack experience in designing and operating district heating networks. Some small cities have constructed gas systems, only to be cut off at peak load periods when heating is most needed due to shortages or have had to provide significant subsidies to maintain affordability levels. Without guidance, cities, especially county towns, are facing a major challenge in finding feasible alternatives. The proposed project offers Hebei Province the opportunity to provide this support. Also, it will help participating heating companies to enhance their institutional and operational performance in some of the areas identified by the Bank district heating study referenced above.

II. Proposed Development Objectives

The proposed project development objective (PDO) is to improve the efficiency and environmental performance of heating systems in project areas of selected municipalities of Hebei Province.

III. Project Description

Component Name

District Heating Subprojects

Comments (optional)

It will finance the construction and rehabilitation of district heating facilities in the four project cities (four subprojects) with a total heating area of 38.7 million m², including 13.5 million m² of new buildings. Each subproject is tailored to fit to the needs of the participating city, but will also have common features aiming to modernize operations and make them more efficient.

-Subproject 1.1. Chengde District Heating and Energy Efficiency Subproject (cost US\$ 35.2

million)

-Subproject 1.2. Zhangjiakou District Heating Subproject (cost US\$ 73.387 million)

-Subproject 1.3. Pingshan (County) District Heating and Energy Efficiency Subproject (cost US\$ 24.86 million)

-Subproject 1.4. Xingtai Industrial Waste Heat District Heating Subproject (cost US\$ 112.380 million)

Component Name

Institutional Capacity Building and Project Management Support

Comments (optional)

The component will finance technical assistance, training, workshops and study tours for the Hebei Project Management Office (HPMO) and the four heating companies, including: (a) project management support to the HPMO and the four heating companies; (b) capacity building support to the heating companies in district heating management, operation and maintenance, and World Bank project implementation procedures; (c) training, workshops and study tours to exchange and learn about good practices in the DH sector; and (d) technical assistance activities tailored to the needs of project's companies.

IV. Financing (in USD Million)

Total Project Cost:	248.33	Total Bank Financing:	100.00
Financing Gap:	0.00		
For Loans/Credits/Others			Amount
Borrower			148.33
International Bank for Reconstruction and Development			100.00
Total			248.33

V. Implementation

The Bank loan to the People's Republic of China will be on-lent to the Hebei Provincial Government, which will in turn on-lend funds to the Chengde, Zhangjiakou, and Xingtai municipal finance bureaus. As Pingshan County is managed by the province, the Bank loan will be directly on-lent to the county government. The proceeds of the Bank loan will be on-lent to the four project companies from the municipal, county or district finance bureaus.

A Project Leading Group (PLG), chaired by an Executive Deputy Governor of Hebei Province, and composed of senior government officials from various departments, has been established to provide high-level guidance to the project and to coordinate policy and institutional issues when needed. In addition, all project cities/counties have established Municipal/District Leading Groups to provide support and ensure smooth project implementation.

The Hebei Project Management Office (HPMO) has been established under the Hebei Foreign Debt Management Center (Provincial Finance Bureau) and is responsible for overall project management, coordination, reporting of consolidated project results to the Bank, as well as implementation of procurement and Component 2. A project management consultant, which will be hired under Component 2, will support the HPMO on all key project functions. The heating companies (except for Xingtai, which is new) have been operating for years, and have experience with the construction and operation of heating networks. In each company, a Project Implementation Unit (PIU) has been

established, often under the Chief Engineer, with full-time staff coming from various departments (engineering, operations, procurement, and finance). The four companies will implement the physical investments under Component 1, and own, operate and maintain the project assets after their construction.

VI. Safeguard Policies (including public consultation)

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	x	
Natural Habitats OP/BP 4.04		x
Forests OP/BP 4.36		x
Pest Management OP 4.09		x
Physical Cultural Resources OP/BP 4.11		x
Indigenous Peoples OP/BP 4.10		x
Involuntary Resettlement OP/BP 4.12	x	
Safety of Dams OP/BP 4.37	x	
Projects on International Waterways OP/BP 7.50		x
Projects in Disputed Areas OP/BP 7.60		x

Comments (optional)

VII. Contact point

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