

Ex-ante Evaluation

1. Name of the Project

Country: People's Republic of China

Project: Jilin Province Jilin City Comprehensive Environment Improvement Project

(Loan Agreement: June 23, 2006; Loan Amount: 9,711 million yen; Borrower: The Government of the People's Republic of China)

2. Necessity and Relevance of JBIC's Assistance

About 68% (2004) of energy consumption in China relies on coal. Acid rain and smoke dust from sulphur oxides (SO_x) are creating serious impacts on people's health condition and the nation's ecosystem. The percent of sewage treated in urban areas is only 43% (2004), and sewerage facilities have not been developed widely in rural areas, which comprise most of the population of over 1 billion. As a result, pollution of rivers and fresh water lakes has become serious. In light of this environment, the Chinese government set strengthening its efforts to comprehensively develop urban environments as a priority issue in the "The State Tenth Five Year Plan for Environmental Protection (2001-2005)." This plan prohibited direct burning of coal and promoted centralized heat supply in urban areas as an air pollution countermeasure. It also proclaimed a goal of treating 60% of the sewage in all major cities by 2005, and 70% in prioritized cities, as a water environmental countermeasure.

Jilin city in Jilin province is this project's target area. It is the second largest city in Jilin province, situated on the upper Songhua River in the center of northeast China. Typically, Jilin households use small coal boilers to heat homes in winter, creating extremely bad air pollution. In 2003, Jilin was ranked 63rd worst of 113 prioritized cities designated as requiring state environmental protection from air pollution. There are concerns that as the city develops rapidly, the degree of pollution will become worse as a result of the installation of large volumes of small coal boilers every year, in addition to the pollution caused by the existing facilities. Against this backdrop, Jilin province announced objectives for air pollution improvement, and 70% of population in the province served with centralized heat supply by 2010, in the "The Tenth Five Year Plan for Environmental Protection in Jilin Province and Perspective Plan for 2010 (2001-2010)." Accordingly, Jilin city government is promoting centralized heat supply in urban areas, along with prohibiting installations of small coal boilers. With regard to the water pollution, sewage treatment facilities are not fully developed in Jilin city, despite the increased sewage volume that city's economic development has brought about. As such, the large volume of untreated sewage flowing into Songhua River is becoming one cause of worsening water quality in Songhua River. Based on this situation, "The Tenth Five Year Plan for Environmental Protection in Jilin Province and Perspective Plan for 2010 (2001-2010)" set an objective of improving the water quality in Songhua River, a resource of potable water for Jilin city, by 2010. The Jilin city government is developing sewage treatment plants and its sewage pipe network in order to raise the sewage treatment rate in urban areas.

This project corresponds to the activity of environmental conservation, a priority area stipulated both in

the Economic Cooperation Program for China by the Japanese Government, and in the Medium-Term Strategy for Overseas Economic Cooperation Operations by JBIC. Thus, JBIC's assistance for this project is highly necessary and relevant.

3. Project Objectives

This project is to reduce the emissions volume of air and water pollutant, by developing centralized heat supply facilities and the sewage pipe network in Jilin city, Jilin province, and thereby contributing to improvement in people's living environment.

4. Project Description

(1) Target Area

Jilin City, Jilin Province

(2) Project Outline

Develop centralized heat supply facilities and a sewage pipe network in Jilin city, purchase necessary materials and equipment, and provide overseas training.

- (a) Centralized heat supply facilities development: Construction of heat supply facilities, heat supply piping, and heat exchange stations.
- (b) Sewage pipe network development: Construction of sewage pipe network and pump stations, and reconstruction of rainwater spillway.
- (c) Training: Training in Japan for operation and maintenance of centralized heat supply facilities and sewerage facilities.

(3) Total Project Cost/Loan Amount

14,676 million yen (Yen Loan Amount: 9,711 million yen)

(4) Schedule

July 2006-end of March 2012 (69 months)

(5) Implementation Structure

- (a) Borrower: The Government of the People's Republic of China
- (b) Executing Agency: Jilin Municipal People's Government
- (c) Operation and Maintenance System: Jilin Municipal People's Government

(6) Environmental and Social Considerations

(a) Environmental Effects/Land Acquisition and Resident Relocation

(i) Category: B

(ii) Reason for Categorization

This project is classified as Category B according to the "Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations" (established April 2002). This categorization is assigned because this project does not correspond to sectors or regions described in said guidelines as being sensitive to negative

impact, and because it is not deemed to have a significant harmful impact on the environment.

(iii) Environmental Permit

The Jilin Province Environmental Protection Office approved the following Environmental Impact Assessment reports for this project: Centralized heat supply facilities development project: July 2005; Sewage pipe network development project: August 2005.

(iv) Anti-Pollution Measures

Air pollution countermeasures will be carried out to meet national emissions standards for air pollutants arising from centralized heat supply facilities. Existing sewage treatment facilities will treat sewage collected via sewage pipes to meet emission standards. Treated sewage will be discharged into the river, and is not foreseen to have special impacts.

(v) Natural Environment

The project target area does not correspond to a sensitive area or its surroundings, such as a national park. Undesirable impacts on the natural environment are assumed to be minimal.

(vi) Social Environment

The Jilin Municipal People's Government has the usage rights for land planned for this project. There will be no site acquisition or resident relocation.

(vii) Other/Monitoring

The Jilin City Environmental Protection Office will monitor air and water quality.

(b) Promotion of Poverty Reduction

None

(c) Promotion of Social Development (e.g. Gender Perspective)

None

(7) Other Important Issues

None

5. Outcome Targets

(1) Evaluation Indicator (Operation and Effect Indicator)

Indicators	Baseline (2005)	Target
Development of Centralized Heat Supply Facilities		(2013, 1 year after completion of project)
SO ₂ emissions reduction volume (tons/year)	0	9,300
NO ₂ emissions reduction volume (tons/year)	0	4,000
TSP emissions reduction volume (tons/year)	0	43,000
Sewage Pipe Network Development		(2010, 1 year after completion of project)
Population served with sewage	129	144

treatment (Unit: 10,000 people)		
Volume of sewage treated (Unit: 10,000m ³ /day)	20	30
Percentage of population served with sewerage (%)	63	84
Quality of water discharged (BOD, mg/L)	30	30

(2) Financial Internal Rate of Return (FIRR)

Development of centralized heat supply facilities: FIRR 7.1%, Development of sewage pipe network: FIRR 6.6%

- (a) Costs: Project cost, operation and maintenance costs
- (b) Benefits: Revenue from fees
- (c) Project life: 30 years

6. External Risk Factors

- (1) Change in planned areas for road constructions or other developments under the current city planning may require changes in target sites for the project and thus could cause delays in construction.
- (2) Change in the policy of principles regarding bearing the burden of fees could cause a shortage of financial funds or fees collected. This in turn could affect operation and maintenance.
- (3) Risk of fluctuation in the price of coal used in the centralized heat supply.

7. Lessons Learned from Findings of Similar Projects Undertaken in the Past

From past ex-post evaluations of yen loan projects, the lesson has been learned that to ensure sustainability of project results, it is important to set an appropriate fee system, taking into consideration the operation and maintenance cost, investment cost, ability of beneficiary residents to pay, and their capacity for financial burden. It is also important to formulate technical standards for frequency of operation and maintenance, and evaluation of the necessity for facility renewal.

Based on this, a request was made under this project to the executing agency that a system be created to establish an appropriate fee system and formulate technical standards. This was approved by the executing agency.

8. Plans for Future Evaluation

(1) Indicators for Future Evaluation

- (a) Central Heat Supply Facilities Development Project
SO₂ emissions reduction volume (tons/year), NO₂ emissions reduction volume (tons/year), TSP emissions reduction volume (tons/year), FIRR (%)
- (b) Sewage Pipe Network Development Project
Population served with sewage treatment (unit: 10,000 people)
Volume of sewage treated (unit: 10,000 m³/day), percent of sewage treated (%)
Quality of water discharged (BOD, mg/L)
FIRR (%)

(2) Timing of Next Evaluation
After completion of project