

**ASIAN DEVELOPMENT BANK**

**TAR: PRC 37617**

**TECHNICAL ASSISTANCE**

(Financed by the Poverty Reduction Cooperation Fund)

**TO THE**

**PEOPLE'S REPUBLIC OF CHINA**

**FOR**

**HEATING SUPPLY FOR URBAN POOR IN LIAONING PROVINCE**

**October 2004**

## CURRENCY EQUIVALENTS

(as of 15 September 2004)

Currency Unit	–	yuan (CNY)
CNY1.00	=	\$0.1208
\$1.00	=	CNY8.2767

The exchange rate of the yuan is determined in relation to a weighted basket of currencies of the trading partners of the People's Republic of China. In this report, a rate of \$1.00 = CNY8.30 is used.

## ABBREVIATIONS

ADB	–	Asian Development Bank
GLP	–	government of Liaoning Province
HSC	–	heating service company
PRC	–	People's Republic of China
SOE	–	state-owned enterprise
TA	–	technical assistance

## TA CLASSIFICATION

<b>Poverty Classification</b>	–	Poverty intervention
<b>Sector</b>	–	Energy
<b>Subsector</b>	–	Energy sector development and reforms
<b>Theme</b>	–	Inclusive social development
<b>Subtheme</b>	–	Other vulnerable groups

Following the Board approval of the R-paper, *Review of ADB's Poverty Reduction Strategy*, staff instructions to replace the PI/CPI classification with a new tracking system are under preparation, in line with para. 83 of the R-paper.

## NOTE

In this report, "\$" refers to US dollars.

This report was prepared by Bo Q. Lin (team leader).

## I. INTRODUCTION

1. During the 2004 Country Programming Mission, the Government of the People's Republic of China (PRC) confirmed its request for technical assistance (TA) from the Asian Development Bank (ADB) to help the government of Liaoning Province (GLP) supply heating to the urban poor, to be financed by the Poverty Reduction Cooperation Fund.<sup>1</sup> In April 2004, the Fact-Finding Mission assessed the results of studies and determined the TA scope. The Mission held discussions with representatives from the Government and GLP. An understanding was reached on the TA goals, purpose, scope, cost estimates, financing and implementation arrangements, and the consultants' terms of reference. The TA is included in the country pipeline for 2004. The TA framework is in Appendix 1.

## II. ISSUES

2. Urban heating demand in the PRC has grown rapidly due to rising incomes, privatization of housing, and housing sector growth. In million square meters (m<sup>2</sup>) of heated area, heating demand has increased by an annual average rate of 17% from 1992 to 2003. Nationwide, residential buildings account for about 70% of total space heating, and commercial and public buildings for the rest. Heating demand in Liaoning has also been growing rapidly during the past decade, with a 14% annual growth rate from 1992 to 2003.

3. Liaoning has a population of about 41 million, of which 55% live in urban areas. As an old industrial base of the PRC, Liaoning is dominated by heavy industry with old technology and large state-owned enterprises (SOEs).<sup>2</sup> Because of its industrial structure and large urban population, Liaoning is the highest energy-consuming province in the PRC. Continued strong economic growth, combined with significant increase in urban housing construction, has resulted in heating demand outpacing supply, particularly in the old section of cities. Most cities suffer heating supply shortages that adversely affect the quality of life and health, particularly of the poor. Liaoning has about 3% of the PRC's total population but accounts for about 10% of total unemployed. Since 1997, urban poverty has been increasing, as urban unemployment soared mainly due to SOE reforms and technology changes, particularly retrenchment of excess employees of large SOEs.

4. Most heating in cities comes from small coal-fired heat boilers, which emit substantial amounts of sulfur dioxide, carbon dioxide, nitrogen oxides, and total suspended particulates. Poverty is often compounded by environmental pollution from household heating sources. Some of the poor in Liaoning do not have the information about and access to, or cannot afford, efficient (less-polluting) appliances and fuels. Heat distribution systems usually function poorly or are even absent in the poor sections of cities. Poorly maintained heat distribution increases the poor's exposure to daily doses of pollutants as well as the risk of accidents. Indoor air pollution particularly puts women and children at risk.

5. The average heating tariff in Liaoning is about CNY20/m<sup>2</sup>.<sup>3</sup> The average heating bill for a poor household living in a 40 m<sup>2</sup> apartment unit is about CNY167 per month during the 5-month heating season. In a typical poor household of four people, for example, the income at the poverty line is CNY780 per household per month in Anshan, CNY624 in Benxi and Yingkou, and

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<sup>1</sup> The TA first appeared in *ADB Business Opportunities* (Internet edition) on 7 February 2004.

<sup>2</sup> SOEs in Liaoning account for about one tenth of total SOEs in the PRC.

<sup>3</sup> The heating tariff of CNY20/m<sup>2</sup> in Liaoning is comparable with about CNY20/m<sup>2</sup> in Heilongjiang, CNY19.5/m<sup>2</sup> in Xinjiang, and CNY24/m<sup>2</sup> in Beijing.

CNY728 in Liaoyang.<sup>4</sup> Thus, the heating bill represents a large portion of the poor household's monthly income (21% in Anshan, 23% in Liaoyang, and 27% in Yingkou and Benxi), indicating that poor households can barely afford heat.

6. In Liaoning, where the winter temperature can dip to minus 35° Celsius, insufficient heating severely affects the quality of life and health of the poor.<sup>5</sup> Limited public resources have forced the GLP to rely increasingly on household financing of heating, but the urban poor cannot afford the rising heating costs. The GLP has thus developed assistance programs to reduce heating costs. However, the programs only cover the poor below the city poverty lines, leaving a vast number of near-poor households to deal with unaffordable heating. Therefore, heating supply policies need to be refined. Different heating supply options for the urban poor need to be evaluated, and comprehensive heating assistance programs established, taking into account the sustainability of the urban heating supply.

7. Consumers are charged for heating by living area, not actual consumption, and the heating tariff structure does not reflect the cost structure of heating services, resulting in wastage of heat.<sup>6</sup> The urban heating service used to be treated as part of the welfare support system. Heating bills were fully or partly paid by employers. Due to reforms, a large number of SOEs in Liaoning became bankrupt or financially troubled, and they considerably reduced payment of employees' heating bills. Revenue collection efficiency thus dropped to 60–70% in the late 1990s, worsening the financial problems of heating service companies (HSCs). Most HSCs in Liaoning are owned and operated by local governments. Urban heating is often priced below the supply cost, and HSCs require continuing financial and other support from local government. HSCs have been losing money or are only marginally profitable. The heating tariff setting, and approval and adjustment criteria and procedures lack transparency, and decisions are frequently influenced by political considerations. The commercial management of HSCs and government social welfare objectives are not separate. Though the billing collection has improved recently, urban heating cannot be sustained without further addressing HSCs' cost-recovery problems.

8. ADB provided a TA in 2000 to help the Ministry of Construction reform the urban heating sector and promote sustainable urban heating supply in the PRC by (i) formulating pro-poor national heating tariff guidelines, and (ii) establishing an effective heating tariff collection mechanism.<sup>7</sup> Liaoning was a pilot province under the study. The TA recommendations were considered relevant and useful. Successful implementation of the pro-poor national heating tariff guidelines and an effective heating tariff collection mechanism will help solve the urban heating shortage, improve HSCs' financial viability, and ensure adequate and affordable heating for the poor. However, implementing these recommendations requires concrete actions and investments at the provincial level. The success of the pro-poor national heating tariff guidelines and improve HSCs' billing collection also depends critically on the GLP's ability to institutionalize a system of close monitoring, supervision, and evaluation of policy implementation and impact at the provincial and local levels.

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<sup>4</sup> The poverty level defined by the project cities is CNY195 per capita per month in Anshan, CNY156 in Benxi and Yingkou, and CNY182 in Liaoyang.

<sup>5</sup> Poor housing exacerbates illnesses such as asthma, and reduces resistance to respiratory illnesses such as influenza, pneumonia, and bronchitis. For example, cardiovascular disease incidence in Shenyang is 12 times that in Shanghai in winter.

<sup>6</sup> Wastage is particularly high in old apartment buildings that have no radiator control valves to adjust room temperatures.

<sup>7</sup> ADB. 2000. *Technical Assistance to the People's Republic of China for Pro-Poor Urban Heating Tariff Reforms*. Manila. The TA is in its last stage of disseminating recommendations to Government departments. The TA is expected to be completed in October 2004.

9. The GLP is trying hard to solve urban poverty and ensure social stability. ADB's operational strategy in the PRC aims to achieve economic growth in an efficient, equitable, and sustainable manner. ADB's PRC energy sector strategy includes (i) developing cleaner energy sources; (ii) renovating and retrofitting facilities to improve efficiency, and reduce emissions; (iii) promoting the corporatization and commercialization of energy utilities; and (iv) reforming pricing, and tariffs. The strategy is complemented by ADB's strategy for the environment sector, which supports the use of economic, supply-side, and other measures to ensure sustainable use of natural resources, promote market-based pricing, encourage cost recovery, and disclose environmental information. The urban poor suffer the most from insufficient heating. The GLP is committed to provide adequate, affordable heating to the urban poor by reforming heating tariffs and developing assistance programs. The TA is a major part of this effort. The TA, by implementing pro-poor national heating tariff guidelines, improving cost recovery of HSCs, and engaging in active policy dialogue, is consistent with and supports the GLP's development objectives and ADB's energy sector strategy.

10. The TA will also widen ADB's effort to increase heating supply through the Liaoning Environmental Improvement Project.<sup>8</sup> By improving heating supply facilities and HSCs' institutional capacities, the Project will substantially improve HSCs' efficiency. The TA will design heating assistance programs for the poor, taking into account the efficiency gains under the Project, including better assessment and discounts on connection fees and heating tariffs. To ensure that the heating assistance program is sustainable, it will be managed by the project city government and complemented by a heating assistance fund, heating tariff policies that follow pro-poor national heating tariff guidelines, and close monitoring of implementation and impact.

### **III. THE TECHNICAL ASSISTANCE**

#### **A. Purpose and Output**

11. The TA objective is to help the GLP provide adequate, affordable heating for the urban poor by helping the GLP implement pro-poor national heating tariff guidelines and improve heating tariff collection; design heating assistance programs for the poor; and develop an effective monitoring, supervision, and evaluation system at the provincial and local levels.

12. The TA will (i) examine key urban heating supply issues; (ii) evaluate different heating supply options for the urban poor; (iii) develop comprehensive heating assistance programs to ensure adequate and affordable heating for the urban poor; (iv) assess heating assistance programs' economic, poverty, environmental, and financial impact in selected pilot cities; (v) develop a system of monitoring, supervision, and evaluation of implementation at the provincial and local levels; (vi) involve the urban poor in design, implementation, and monitoring of heating assistance programs; (vii) identify and remove barriers to, and develop an action plan for, implementation of pro-poor national heating tariff guidelines and improve heating tariff collection; (viii) conduct an international seminar; (ix) carry out a field study; and (x) conduct a consultation workshop with the main stakeholders.

#### **B. Methodology and Key Activities**

13. The TA will be carried out in three phases. During phase I, the consultant will gather data and conduct a preliminary analysis of issues relating to urban heating supply. The consultants

<sup>8</sup> The Project is expected to be approved by the ADB Board in 2004.

will identify the main issues to be solved to achieve the TA objectives, and clarify the focus of the study and make a detailed analysis of the key province-specific urban heating supply issues. Under phase II, the consultant will help the GLP implement the pro-poor national heating tariff guidelines by preparing an action plan; analyzing urban heating supply and demand; examining key issues relating to heating technology, investment programs, heating tariffs, collection mechanism, and legal and regulatory aspects of urban heating; and evaluating different supply options for the urban poor. In phase III, the consultants will develop heating assistance programs to ensure adequate and affordable heating for the urban poor. The consultant will also assess the impact of the proposed heating assistance programs from technical, institutional, economic, social, financial, pricing, environmental, and poverty viewpoints, and establish an effective monitoring and evaluation plan. The consultant will involve the urban poor in design, implementation, and monitoring of heating assistance programs, and discuss the recommendations in a workshop with the main stakeholders. The consultant will organize a final workshop with the main stakeholders to disseminate the TA findings and recommendations. The consultant will meet representatives of external funding agency, donor countries and institutions to find out their interest in helping the PRC supply heat to the urban poor. The outline terms of reference for consultant are in Appendix 2.

14. The consultant will help organize an international seminar on heating supply for the poor, to which international and domestic experts will be invited to present papers and participate in discussions. After the seminar, the consultant will summarize the discussions and identify the issues. The TA includes an international field study to expose selected personnel to the latest trends and international best practices in heating assistance programs for the poor. GLP personnel involved in policymaking and implementation of heating assistance programs for the poor will undertake the 10-day study. The consultant will consider the participants' specific needs and prepare a detailed proposal for ADB approval, specifying the (i) objectives of the field study, (ii) institutions to be visited, (iii) agenda for discussions and training, (iv) name and job description of each person nominated to participate, and (v) costs. Procedures to select participants will be economical, efficient, and acceptable to ADB. At the end of the field study, the participants will submit to ADB a report summarizing their findings and recommendations.

15. The urban poor must participate in designing, implementing, and monitoring the heating assistance programs. Participatory activities will be developed to collect data from low-income heating users in the pilot cities and identify their special needs and priorities. The consultant will analyze possibilities and develop strategies for urban poor participation in the design of heating assistance programs. In particular, the ability and willingness of urban households to use heating under the proposed heating assistance programs will be carefully assessed.

16. The major risks that need to be considered for successful TA implementation include inadequate counterpart support, inadequate and delayed provision of data, late submission of required studies, delayed consultant selection, and poor consultant performance. The Government must continue to be committed to provide adequate, affordable heating to the poor, and to rationalize heating tariffs and make regulation transparent. A competent consultant firm will be recruited on time. The GLP is committed to supplying adequate, affordable heating to the urban poor, and agreed to provide adequate counterpart support and data. Close coordination among the consultant, executing and implementing agencies, and ADB will further mitigate these risks.

### **C. Cost and Financing**

17. The TA is estimated to cost \$700,000 equivalent, with a foreign exchange cost of \$322,000 and a local currency cost of \$378,000 equivalent (Appendix 3). ADB will provide

\$500,000 equivalent to finance \$322,000 of the foreign exchange cost and \$178,000 equivalent of the local currency cost. The TA will be financed on a grant basis by the Poverty Reduction Cooperation Fund and will be administered by ADB. The GLP will contribute \$200,000 equivalent, representing about 29% of the TA cost, to finance the remaining local currency cost.

#### **D. Implementation Arrangements**

18. The Liaoning Development and Reform Commission will be the Executing Agency.<sup>9</sup> ADB will select and engage the services of international and domestic consultants according to its *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for selecting and engaging domestic consultants. The consultants will have expertise in urban heating supply and engineering, heating tariffs, financial and economic analyses, institutional analysis, and urban poverty and environmental assessment. An estimated total of 29 person-months of consulting services will be required: 8 for international and 21 for domestic. The services will be provided through a consulting firm selected following the submission of simplified technical proposals and the use of the quality- and cost-based selection. The TA is expected to commence on 1 December 2004 and be completed by 30 September 2005.

19. The GLP will establish a counterpart team comprising representatives of the GLP, HSCs and local governments of the pilot-study cities.<sup>10</sup> The counterpart team will closely interact with the consultant. The GLP will also establish a steering committee comprising senior GLP officials and representatives from other government organizations and agencies that formulate and implement urban heating policies. The steering committee will be the apex body that will convey and interpret the Government's views on policy issues and generally oversee TA implementation. The counterpart team members will interact with steering committee members to clarify matters that fall outside the GLP's purview. The GLP will provide interpreters, local transportation, and suitably equipped office space in Shenyang. Computer and office equipment to be financed under the TA will be procured by the international consultant in accordance with ADB's *Guidelines for Procurement*. The consultants will establish an effective monitoring and evaluation system to monitor the impact of the TA, which will provide the basis for the GLP's impact monitoring after the completion. The monitoring and evaluation system will include specific and measurable targets, and identify key risks and institutional arrangement for effective monitoring. The consultants will also provide the necessary trainings on monitoring. Within 3 to 5 years after the TA completion when development impacts should be evident, the GLP will carry out the impact assessment of the TA. In addition, the implementation of the Liaoning Environmental Improvement Project will last for next five years. This will provide opportunities for ADB staff to monitor the impact of the TA.

### **IV. THE PRESIDENT'S DECISION**

20. The President, acting under the authority delegated by the Board, has approved ADB administering technical assistance not exceeding the equivalent of \$500,000 to the Government of the People's Republic of China to be financed on a grant basis by the Poverty Reduction Cooperation Fund for Heating Supply for the Urban Poor in Liaoning Province, and hereby reports this action to the Board.

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<sup>9</sup> The commission is the most important GLP agency that promotes development and reform.

<sup>10</sup> The GLP and ADB will select and agree on the pilot cities during phase 1 of the TA.

## TECHNICAL ASSISTANCE FRAMEWORK

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions and Risks
<p><b>Goal</b></p> <p>Adequate, affordable heating for the urban poor in Liaoning</p>	<ul style="list-style-type: none"> <li>• Number of urban poor participate in heating assistance programs</li> </ul>	<ul style="list-style-type: none"> <li>• Country economic and heating sector statistics</li> <li>• Policy dialogue with the Government</li> <li>• Impact monitoring by the government of Liaoning Province (GLP) and Asian Development Bank (ADB)</li> </ul>	
<p><b>Purpose</b></p> <ol style="list-style-type: none"> <li>1. Successful implementation of pro-poor national heating tariff guidelines and effective heating tariff collection mechanism</li> <li>2. Heating assistance programs for the urban poor</li> </ol>	<ul style="list-style-type: none"> <li>• An implementation plan developed by 2005, and implemented by 2006, and 98% of billing collection of Heating Supply Companies by 2007</li> <li>• Practical heating assistance programs for the urban poor by 2005 and full implementation by 2006</li> </ul>	<ul style="list-style-type: none"> <li>• Technical assistance (TA) final report and TA completion report (TCR)</li> <li>• Consultation workshop</li> <li>• Review missions</li> <li>• Implementation and impact monitoring by the GLP and ADB</li> <li>• Ex-post monitoring through ADB loan review missions</li> </ul>	<p><b>Risks:</b></p> <ul style="list-style-type: none"> <li>• Counterpart support is inadequate.</li> <li>• Data is inadequate.</li> <li>• Consultants perform poorly.</li> </ul> <p><b>Assumptions:</b></p> <ul style="list-style-type: none"> <li>• The Government is willing to reform the heating sector.</li> <li>• Heating sector reform continues.</li> <li>• Demand continues to grow.</li> </ul>
<p><b>Outputs</b></p> <ol style="list-style-type: none"> <li>1. Action plan for implementing national heating tariff guidelines</li> <li>2. Design of heating assistance programs and assessments</li> <li>3. Monitoring, supervision, and evaluation system</li> <li>4. Field study report</li> <li>5. International seminar report</li> </ol>	<ul style="list-style-type: none"> <li>• A pragmatic action plan</li> <li>• Well-designed heating assistance programs</li> <li>• Sharing knowledge and experience of other countries</li> <li>• Monitoring system in place</li> </ul>	<ul style="list-style-type: none"> <li>• Inception report</li> <li>• International seminar report</li> <li>• Field study report</li> <li>• Draft final report</li> <li>• Final report</li> <li>• Review mission and TCR</li> <li>• Implementation and impact monitoring by the GLP and ADB</li> </ul>	<ul style="list-style-type: none"> <li>• Reform and development measures are relevant and sensitive to local issues.</li> <li>• Counterparts participate actively.</li> <li>• The household survey is accurate.</li> </ul>

*Continued on next page.*

**TECHNICAL ASSISTANCE FRAMEWORK—Continued**

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions and Risks
<p><b>Activities</b></p> <p>1. Phase I: Preliminary analysis and preparation to implement guidelines</p>	<ul style="list-style-type: none"> <li>• Key issues acceptable to GLP and ADB</li> <li>• Selected pilot cities acceptable to the GLP and ADB</li> </ul>	<ul style="list-style-type: none"> <li>• Meetings with consultants</li> <li>• Review mission reports</li> <li>• Draft final report</li> </ul>	<p><b>Risks:</b></p> <ul style="list-style-type: none"> <li>• Counterpart support is lacking.</li> </ul>
<p>2. Phase II: Implementation of tariff guidelines and international best practices</p> <p>3. Phase III: Heating assistance programs, impact assessment, and monitoring</p>	<ul style="list-style-type: none"> <li>• Sharing international experience relevant to the GLP</li> <li>• Pro-poor tariff guidelines implemented on schedule</li> <li>• Heating assistance programs accepted by all stakeholders</li> <li>• Effective implementation plan</li> <li>• Effective monitoring system and trainings</li> </ul>	<ul style="list-style-type: none"> <li>• Consultation workshop report</li> <li>• Final report</li> <li>• TA implementation plan</li> <li>• Implementation and impact monitoring by the GLP and ADB</li> </ul>	<ul style="list-style-type: none"> <li>• Data is inadequate.</li> <li>• Consultant recruitment is late.</li> </ul> <p><b>Assumptions:</b></p> <ul style="list-style-type: none"> <li>• Arrangements for International visits are adequate.</li> <li>• Consultants are selected on time, are suitably qualified, and perform well.</li> <li>• International and domestic speakers are qualified, and selected on schedule.</li> <li>• The household survey is accurate.</li> <li>• The Executing Agency owns the TA.</li> </ul>
<p><b>Inputs</b></p> <p>1. International and domestic consulting services</p> <p>2. Field study and training</p> <p>3. International seminar and consultation workshop</p> <p>4. Counterpart staff participation</p> <p>5. Computer and office facilities</p>	<ul style="list-style-type: none"> <li>• 8 person-months of international and 21 person-months of domestic consulting services</li> <li>• Field study and training for \$20,000</li> <li>• International seminar and consultation workshop for \$22,000</li> <li>• ADB financing of \$500,000</li> <li>• GLP contribution of \$200,000 equivalent</li> </ul>	<ul style="list-style-type: none"> <li>• Review mission reports</li> <li>• Consultation workshop report</li> <li>• Final report</li> <li>• Field study report</li> <li>• Implementation and impact monitoring by the GLP and ADB</li> </ul>	<p><b>Assumptions:</b></p> <ul style="list-style-type: none"> <li>• International visits and seminars are arranged efficiently.</li> <li>• Cost estimates are accurate.</li> <li>• Counterpart support and office facilities are adequate.</li> </ul>

## OUTLINE TERMS OF REFERENCE FOR CONSULTING SERVICES

1. The technical assistance (TA) will be carried out by a consulting firm with experience in technical, institutional, economic, financial, environmental, and social analyses; impact assessment; heating tariffs; and analysis of heating subsidies. The team of international consultants will consist of a heating tariff specialist, a power economist, a social impact analyst, a financial analyst, and an institutional specialist. The study will require about 8 person-months of international and 21 person-months of domestic consulting services. To ensure effective assistance to the international consultants, the team of domestic consultants will have the same composition. The consultants will work in close collaboration with the government of Liaoning Province (GLP) and ensure effective know-how transfer. The international consultants will be recruited in accordance with *Guidelines on the Use of Consultants* of the Asian Development Bank (ADB).

2. When the TA starts, the consultants will do a detailed background study to thoroughly understand urban heating supply issues in the People's Republic of China (PRC). The consultants will review reports and studies, including those of the GLP and international agencies, including ADB, World Bank, and other aid agencies. After reviewing the basic information, the consultants will determine the selection criteria and number of pilot cities, and recommend pilot cities for approval by the GLP and ADB. The consultants will discuss the Government's reform directions with members of the steering committee and counterpart team to establish a sound basis for the TA work. The consultants should evaluate the international experience in related areas and its relevance to the PRC, and tailor their recommendations to ensure they are relevant to and can be implemented in the PRC. The recommendations should focus on how to make heating supply for the urban poor efficient.

3. The terms of reference of the consulting services will include, but will not be limited to the following.

### A. Terms of Reference

#### 1. Phase I: Data Collection and Preliminary Analysis

4. During phase I, the consultants will do the following:

- (i) Determine the historical urban heating supply and demand patterns in Liaoning and select the methodologies to forecast them for major cities.
- (ii) Interview provincial and city pricing bureaus and heating service companies (HSCs) to present a clear picture of heating tariff levels and structures, connection fees and any surcharges, revenue collection efficiency, tariff setting policies, criteria, methodologies, adjustment procedures and approval process, and any tariff discounts and/or design for helping the urban poor lower their heating expenses.
- (iii) Analyze the market share of central heating systems by heating technology and fuel type, and estimate the number of existing small coal-fired heat boilers, their heat production and supply efficiency, and associated amounts of pollutants emitted to the air annually, including greenhouse gases.
- (iv) Identify and analyze the financial, regulatory, institutional, economic, technical, and social barriers for private sector participation in Liaoning's urban heating sector.

- (v) Using provincial and city statistical data, draw up household profiles of the urban poor who receive city heating services. Households may be those (a) receiving the minimum living guarantee from the city government, (b) with incomes marginally higher than the minimum living guarantee, and (c) with vulnerable members (disabled, chronically sick, unable to work, aged 65 or over, laid off or retired from a bankrupt or financially troubled enterprise, etc.).
- (vi) Conduct an independent household survey in the pilot cities on heat consumption patterns, income profiles, heating expenses compared to household incomes, alternative and supplemental heating sources to central heating and the associated costs, affordable heating expense levels, willingness to pay for central heating service, dwelling energy efficiency, and other information.
- (vii) Analyze provincial and city policies, programs, and guidelines on providing heating assistance and subsidies to the urban poor, including program coverage and effectiveness, subsidy eligibility, subsidy level, methods for determining subsidy level, funding sources and levels, application and verification procedures, and subsidy delivery mechanisms. If a city has no heating assistance policies or programs for the poor, identify the reasons why. Evaluate how the carbon market can fund such assistance.
- (viii) Review the pro-poor national heating tariff guidelines and other related recommendations under TA 3673-PRC<sup>1</sup>, including lessons learned, reforms necessary, and resources required for implementation at the provincial level.
- (ix) Conduct participatory activities in the pilot cities to collect data from low-income and vulnerable households to determine their concerns regarding central heating, and estimate affordable heating payments based on this and previously collected information.

## **2. Phase II: Implementation of Tariff Guidelines and International Best Practices**

5. Based on the results of the previous phase, an action plan will be prepared to implement the pro-poor national heating tariff guidelines and analyze in-depth heating supply options for the urban poor, including technologies, funding strategy, special heating assistance programs, and tariff design features to ensure central heating services for the urban poor. The consultants will do the following:

- (i) Review and analyze the international best practices of heating assistance programs to poor and needy households in developed countries and transition economies in Central and Eastern Europe, and assess their applicability to Liaoning.
- (ii) Prepare an action plan for phased implementation of the pro-poor national heating tariff guidelines in Liaoning. Identify barriers to implementation and propose measures to dismantle them.
- (iii) Based on the pro-poor national heating tariff guidelines, recommend specific heating tariff reforms, including tariff-setting criteria and methodologies, cost-reflective tariff structure, tariff application and approval procedures, consumption-

<sup>1</sup> ADB. 2000. *Technical Assistance to the People's Republic of China for Pro-Poor Urban Heating Tariff Reforms*. Manila.

based tariff, individual-based billing system, and commercial management of heating tariffs.

- (iv) Recommend ways to implement the reform measures in the TA for pro-poor urban heating tariff reforms<sup>2</sup>, including installation of radiator control valves, heat measuring devices such as heat cost allocators or heat meters, and lock valves in individual apartment units.
- (v) Analyze urban heating supply and demand, and examine key issues relating to heating technology, investment programs, heating tariffs, collection mechanism, and legal and regulatory aspects of urban heating.
- (vi) Evaluate supply options for the urban poor, taking into account their cost recovery and sustainability.
- (vii) Recommend least-cost heating supply options and technologies and ways to apply least-cost heating supply options in the heating assistance programs.
- (viii) Recommend measures to overcome barriers to private sector participation in the urban heating sector.
- (ix) Discuss with the GLP implementation of the pro-poor national heating tariff guidelines in the pilot cities and provide training to personnel of provincial and city pricing bureaus and HSCs.

### **3. Phase III: Heating Assistance Programs, Impact Assessment, and Monitoring**

6. The consultants will recommend ways to improve heating assistance programs, assess impacts, and develop an effective monitoring and evaluation system. The consultants will do the following:

- (i) Develop comprehensive heating assistance programs to ensure adequate, affordable heating for the urban poor, including instruments for output-based subsidies to target a group of beneficiaries.
- (ii) Involve the urban poor in heating assistance programs to ensure that heating services will not be disconnected. These programs should (a) subsidize heating for the urban poor, and (b) help the urban poor improve efficiency of heat consumption and reduce their heating bills. Recommend a lifeline rate and other special heating tariff design features to lower the urban poor's heating bills.
- (iii) Analyze the economic, poverty, financial (including GLP's budget), and environmental impact of the heating assistance programs in the pilot cities in accordance with ADB guidelines and methodologies. The linkage between heating tariff reforms, adequate and affordable heating, and poverty reduction should be well established and quantitatively evaluated.
- (iv) Develop an effective monitoring and evaluation system by reviewing all related documents to determine a set of monitoring indicators in economic growth, energy efficiency, institutional reforms, poverty and social aspects, and

<sup>2</sup> ADB. 2000. *Technical Assistance to the People's Republic of China for Pro-Poor Urban Heating Tariff Reforms*. Manila.

environmental improvement. The indicators should be appropriate for the monitoring system's objectives, the main stakeholders, the speed with which the information is needed, and the cost.

- (v) Assess resource requirement and institutional arrangement of monitoring the TA impact and identify data collection analysis and reporting skills, and management information system skills required to implement the monitoring and evaluation system. The consultants will identify the training requirements and provide the necessary trainings on monitoring.
- (vi) Review the progress in training of provincial and district staff to implement the pro-poor heating tariff guidelines, and assess the need for monitoring and reporting software, among other things, to support implementation of the guidelines and heating assistance programs.
- (vii) Hold a consultation workshop with all stakeholders to present the TA final draft report. Incorporate comments into the final report.

### C. Reports

7. The consultants will submit the following reports:

- (i) **Inception report.** The report will be submitted within 1 month after the TA starts, summarizing the initial findings, and suggesting changes needed (if any) in the TA's approach, methodology, and time schedule. A report on the international seminar, and a report at the end of the international field visit, summarizing the main issues and findings, will also be submitted.
- (ii) **Draft final report and workshop.** The GLP and ADB will have 1 month to review the report. It will be discussed in a consultation workshop with the main consumers, counterpart team, steering committee members, and key officials from other government agencies involved in heating tariff policy formulation and implementation. ADB staff will participate in the consultation workshop. The workshop's main objectives are to (a) present to policymakers, and stakeholders the TA findings, and recommendations; (b) facilitate idea exchange and gather comments; (c) increase ownership and commitment to the TA recommendations; and (d) allow policymakers to discuss stakeholders' feedback.
- (iii) **Final report and final workshop.** One month after the consultation workshop, the consultants will submit the final report, taking into account the comments of the GLP and ADB on the draft final report, and discussions during the consultation workshop. The consultants will write the final report and translate it into Chinese. The consultants will organize a final workshop with the participation of main stakeholders to disseminate the TA findings and recommendations.

**COST ESTIMATES AND FINANCING PLAN**  
(\\$)

Item	Foreign Exchange	Local Currency	Total Cost
<b>A. Poverty Reduction Cooperation Fund Financing<sup>a</sup></b>			
1. Consultants			
a. Remuneration and Per Diem			
i. International Consultants	174,700	0	174,700
ii. Domestic Consultants	0	97,200	97,200
b. International and Local Travel	40,000	7,500	47,500
c. Reports and Communications	8,000	9,000	17,000
2. Equipment <sup>b</sup>	15,000	0	15,000
3. Training, Seminars, and Conferences	15,000	7,000	22,000
4. Field Study	20,000	0	20,000
5. Surveys	0	25,000	25,000
6. Miscellaneous Administration and Support Costs	2,000	5,000	7,000
7. Representative for Contract Negotiations	5,000	0	5,000
8. Contingencies	42,300	27,300	69,600
<b>Subtotal (A)</b>	<b>322,000</b>	<b>178,000</b>	<b>500,000</b>
<b>B. Government Financing</b>			
1. Office Accommodation and Transport	0	70,000	70,000
2. Remuneration and Per Diem of Counterpart Staff	0	62,000	62,000
3. Training, Seminars, and Conferences	0	30,000	30,000
4. Others	0	38,000	38,000
<b>Subtotal (B)</b>	<b>0</b>	<b>200,000</b>	<b>200,000</b>
<b>Total</b>	<b>322,000</b>	<b>378,000</b>	<b>700,000</b>

<sup>a</sup> Administered by the Asian Development Bank.

<sup>b</sup> Including three pentium computers, two photocopiers, a laser printer, a projector, and a facsimile machine.

Source: Asian Development Bank estimates.