



# Technical Assistance Report

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Project Number: 39653  
July 2006

People's Republic of China: Preparing the Energy  
Conservation and Resource Management Project

Asian Development Bank

## CURRENCY EQUIVALENTS

(as of 3 July 2006)

Currency Unit	–	yuan (CNY)
CNY1.00	=	\$0.1251
\$1.00	=	CNY7.9943

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 = CNY8.0029 is used.

## ABBREVIATIONS

ADB	–	Asian Development Bank
DSM	–	demand-side management
EIA	–	environment impact assessment
EMP	–	environment management plan
EPP	–	efficiency power plant
GDP	–	gross domestic product
GGP	–	government of Guangdong Province
NDRC	–	National Development and Reform Commission
PRC	–	People's Republic of China
TA	–	technical assistance

## TECHNICAL ASSISTANCE CLASSIFICATION

<b>Targeting Classification</b>	–	General intervention
<b>Sector</b>	–	Energy
<b>Subsector</b>	–	Energy sector development
<b>Theme</b>	–	Environmental sustainability
<b>Subtheme</b>	–	Cleaner production, control of industrial pollution

## NOTE

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

<b>Vice President</b>	C. Lawrence Greenwood, Jr., Operations Group 2
<b>Director General</b>	H. S. Rao, East Asia Department (EARD)
<b>Director</b>	A. Terway, Energy Division, EARD
<b>Team leader</b>	S. F. Wong, Senior Financial Specialist, EARD
<b>Team member</b>	Y. Li, Senior Project Officer, EARD

## I. INTRODUCTION

1. During the 2006 Country Programming Review 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 prepare the Energy Conservation and Resource Management Project (the project).<sup>1</sup> In May 2006, a Fact-Finding Mission was fielded to assess the results of available studies and determine the scope of the TA. The Mission held discussions with representatives from the Government of the PRC (the Government) and officials concerned from the government of Guangdong Province (GGP). 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 2006 and the project in the country pipeline for 2007. The TA design and monitoring framework is in Appendix 1.

## II. ISSUES

2. The rapid increase in energy demand that has accompanied economic growth has contributed significantly to increased environmental pollution. Pollution has resulted from the power sector's heavy dependence on coal-fired power generation—of the approximately 2.2 billion tons of coal produced in 2005, about 50% was used for power generation—and limited investment in appropriate environmental abatement technology. The industrial sector is also reliant on coal, and utilizes obsolete production processes. Coal resources are abundant and production is relatively inexpensive. Emissions of major air pollutants peaked in 1995 and subsequently declined, but have increased again in recent years. More than 63% of major cities do not meet the grade II national air quality standards.

3. The country's demand for energy will continue to increase in the future, as a result of (i) rapid economic growth, projected to be around 8% per year; (ii) low current per capita energy consumption, which is about one tenth that of the United States;<sup>2</sup> (iii) the increasing motorization of the transport sector; and (iv) rapid urbanization, with a minimum of 12 million–15 million rural emigrants per year. The energy sector will continue to be characterized by (i) high consumption of coal, which meets about 68% of primary commercial energy demand, (ii) a large workforce involved in coal production and transportation, and (iii) an extensive coal infrastructure. A significant and rapid shift away from coal in the medium term is unlikely, because oil and gas reserves and the potential for further hydropower resource development are both limited. Using the most optimistic scenario of (i) increased use of domestically produced natural gas, (ii) importation of liquefied natural gas, and (iii) timely construction of the required natural gas distribution networks, natural gas is expected to account for only 10% of the primary commercial energy mix by 2020.

4. Given the expected economic growth, keeping emissions at current levels will require a steep decline in pollution intensity (pollution caused per unit of gross domestic product [GDP]). Industrial pollution intensities, pollution loads, and environmental contamination will increase unless the Government's pollution-abatement incentives are adjusted. At present, the environmental and health costs associated with coal use are not internalized. Consequently, fuels that are less harmful to the environment, such as natural gas and renewable energy, are at a disadvantage vis-à-vis coal. Increasing the minimum smokestack height for coal-fired plants, and introducing market-based instruments (such as taxation of coal use and use of sulfur dioxide emission trading permits) would help reduce the advantage now given to coal. Pollution caused by

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<sup>1</sup> The TA first appeared in *ADB Business Opportunities* on 15 April 2005.

<sup>2</sup> For instance, current household electricity consumption is only about 4% of that in the United States.

the use of coal is aggravated by the economy's relatively high energy intensity, which requires about 3.8 times more energy per unit of economic output than the world average.

5. Guangdong is a large province and its energy consumption has a significant impact on the country's overall energy intensity. It has the highest GDP of all the inland provinces and municipalities, with expected annual growth of 9% from 2006 to 2010. During the 10<sup>th</sup> 5-year plan period (2000–2005), Guangdong's GDP surged by 13% per year, while the total installed electricity generating capacity increased even more rapidly, by 14.9% annually.<sup>3</sup> The situation is mainly due to (i) ongoing development of energy efficiency standards and inadequate enforcement of existing ones, (ii) inefficient energy price signals for consumers, (iii) low investments in energy-efficient technologies and practices, (iv) the relatively large contribution made to GDP by energy-intensive fixed asset production, (v) the lack of a legal and regulatory framework to adopt effective demand-side management (DSM) policies, and (vi) the need for local and national capacity building in energy conservation.

6. The Government has recognized the enormous potential for energy conservation and the benefits it can provide in terms of (i) reductions in (a) energy resource use, (b) financing requirements for new energy supply projects, and (c) the emissions associated with increases in energy consumption, as well as (ii) increased energy supply security. The Government has therefore established a broad target of quadrupling GDP but only doubling energy consumption between 2000 and 2020. To achieve this, the Government's top priority in the 11<sup>th</sup> 5-year plan (2006–2010) is a 20% reduction in energy intensity. Though Guangdong's energy intensity has been slightly lower than the national average, the GGP still plans to reduce energy intensity by 13% between 2006 and 2010, which equals a 2.8% annual reduction. In January 2005, the National Development and Reform Commission (NDRC) published the China Medium- and Long-Term Energy Conservation Plan. The plan gives priority to energy conservation over the development of new energy sources in fueling economic growth. Energy conservation is to be achieved in all major industries, and specific key projects have been identified, such as retrofit projects, energy system optimization projects, construction of cogeneration power plants and energy-efficient buildings, DSM projects, and capacity building for promoting and implementing energy conservation projects.

7. The country has achieved energy savings in industrial boilers and energy-intensive industries such as steel, cement, and chemicals, which contributed to a 70% decrease in energy consumption per unit of economic output between 1980 and 1998. Those industries have been targeted for further energy savings under the China Medium- and Long-Term Energy Conservation Plan, through the installation of boilers, equipment, and production processes that are more energy efficient following the introduction and implementation of correspondingly stricter energy efficiency standards. As recognized in the plan, there is considerable potential for energy conservation through DSM programs. In this context, DSM refers to tools and practices to decrease the cost of meeting consumer electricity demand, through investments that enable better management of grid electricity loads and more efficient use of electricity by end users. In particular, DSM programs aim to reduce peak demand for electricity—which requires power-generation capacity that is used only when the daily peak occurs—through load management and by promoting consumer use of equipment and appliances that are more energy efficient.

8. DSM programs are not yet being implemented on a large scale, but studies have found that (i) the potential for cost-effective DSM is very large, (ii) meeting demand for additional power through investments in both DSM and new power-generation capacity is less costly than meeting

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<sup>3</sup> By 2005, the total installed capacity in Guangdong Province had reached 48 gigawatts, excluding additional capacity of 10,880 megawatts, which was transported from western provinces through "west-to-east" power transmission systems.

such demand solely through new power-generation capacity and power transmission and distribution systems, (iii) DSM is fully consistent with the country's goal of sustainable energy sector development, (iv) DSM is a proven and effective method for immediately addressing anticipated power shortages, and (v) successful DSM implementation will require the adoption of supportive policies and rules that make DSM an integral part of power sector reform and planning.<sup>4</sup>

9. ADB financed an initial study of the DSM potential in Jiangsu Province. The study found that an investment of \$220 million for the installation and use of high-efficiency commercial cooling/lighting equipment, industrial motor drive systems, and residential appliances—also referred to as “the efficiency power plant (EPP) project concept”—will obviate the need to install 600 megawatts of new power generation capacity. In general, it is estimated that such energy conservation projects make additional electricity available at 75% of the present electricity cost.<sup>5</sup> An appropriate policy and regulatory framework has to be developed that (i) provides incentives for consumers to install energy-efficient equipment and appliances, (ii) fairly distributes costs and benefits between electricity suppliers and consumers, (iii) establishes a mechanism for (partial) financing of energy-efficient equipment and appliances and collection of payments from beneficiaries, and (iv) sets implementation and verification rules for EPP projects.

10. Studies carried out to date indicate that overcoming market barriers is crucial for successful EPP project initiation and implementation. Accordingly, the preferred option is for local power companies to provide the energy-efficient equipment and appliances to the various consumers, who are subsidized to compensate for higher equipment and appliance costs, and must surrender equipment and appliances currently in use. Power companies subsequently recover subsidy costs through an additional energy conservation charge in the electricity tariff.<sup>6</sup> Alternatively, energy services companies could provide energy-efficient equipment for relatively large electricity consumers and recover the investment through a service charge.

11. In 2005 TA<sup>7</sup> was provided to assist NDRC in identifying options and corresponding requirements for the development of an appropriate policy and regulatory framework to promote and implement EPP projects, and to prepare the survey and preliminary design for a demonstration EPP project in Guangdong Province. That TA's recommendations will provide the necessary policy environment for promotion of EPP projects. Also, staff of agencies concerned will be trained in conducting energy conservation surveys that will provide the required technical information for preparing other EPP projects. The GGP has initially examined the possible scope for an EPP of about 350 megawatts in Guangdong which may include (i) renovation of industrial motors, (ii) replacing inefficient power transformers, (iii) promoting efficient lighting, (iv) retrofitting of existing air conditioning systems, and (v) other possible DSM components.

12. One of the Government's main development objectives in the 11th 5-year Plan is improving energy efficiency, which is consistent with another development priority: that of containing the worsening trend of environmental pollution and ecosystem degradation, and improving the environment. ADB's operational strategy aims to help achieve economic growth in an efficient, equitable, and sustainable manner, and supports the Government's energy development program,

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<sup>4</sup> For instance, it is estimated that enforcement of improved energy efficiency standards and introduction of DSM incentives would delay the need for construction of new power-generation capacity of 100 gigawatts until 2020.

<sup>5</sup> The Regulatory Assistance Project, The Lawrence Berkely National Laboratory, and the Natural Resources Defense Council. (June). 2005. *Relationship of Efficiency Power Plants (EPPs) and Energy Management Companies (EMCs)*. Manila

<sup>6</sup> Such a charge for energy conservation in the electricity tariff has been adopted in many countries, but is not used in the PRC.

<sup>7</sup> ADB. 2005. *Technical Assistance to the People's Republic of China for Energy Conservation and Resource Management*. Manila (TA 4706-PRC, approved in December).

which aims to expand energy supplies and promote energy conservation and end-use efficiency. ADB's strategy for the environment sector and power subsector focuses on (i) strengthening the legal and regulatory framework for sustainable environmental management, (ii) supporting the utilization of economic and other measures to ensure sustainable utilization of natural resources, and (iii) promoting the use of cleaner technologies. ADB's poverty reduction strategy for the country encompasses a range of measures including providing goods and services directly to the most vulnerable members of society and promoting sustainable growth. Therefore, the proposed project will support both national and provincial development priorities and is consistent with ADB operational strategies. Guangdong was selected for the proposed project because of (i) insufficient electricity supply and large peak demand, and (ii) GGP's willingness to make substantial efforts to support energy conservation. The proposed project is a small part of the overall energy conservation effort in the province and country, but is nevertheless significant, as it focuses on DSM, includes energy efficiency and air pollution reduction as main thematic objectives, and will demonstrate a new approach to addressing energy conservation and environmental issues in the long term.

13. The proposed project will incorporate lessons regarding design, preparation, risk assessment, and implementation from earlier projects. Expected efficiency improvements will be carefully assessed, and a mechanism developed for cost recovery under the project to ensure the financial performance of entities involved. Strong economic performance is expected in Guangdong Province, based on the proposed target for energy intensity under the 11th 5-year plan, in which the Government has made a strong commitment to accelerate energy conservation efforts. The activities under the project will be based on proven designs and technologies that have been used successfully in the PRC or in other countries. Although earlier studies have demonstrated the viability of energy conservation through DSM, risks will be carefully assessed during project preparation. The risk of construction delays due to late internal approvals and procurement will be addressed by early preparation and procurement training.

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

#### **A. Impact and Outcome**

14. The TA will help GGP prepare an energy conservation and resource management project in Guangdong Province. The TA outcome will be an agreement with GGP and the Government on project design, a detailed feasibility report, and project implementation arrangements.

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

15. As discussed above (para. 11), the ongoing advisory TA will help identify the most appropriate project components for the ensuing loan. Based on this, the TA will (i) assess demand and demand-side management potential; (ii) carry out least-cost analysis, incorporating demand-side management options; (iii) provide cost estimates and procurement arrangements, and prepare a contract packaging plan; (iv) carry out economic, financial, and risk analyses; (v) prepare the environmental impact assessment and land acquisition and resettlement plans, and provide summaries of each; (vi) analyze the financial governance and financial performance of implementation agencies; (vii) recommend necessary enterprise and sector reforms; (viii) evaluate the social poverty impact of the project and identify ways to make the project more pro-poor; (ix) establish indicators and a mechanism for monitoring them; and (x) support private sector participation. An initial social and poverty assessment is provided in Appendix 2.

16. The risks that could jeopardize successful TA implementation include (i) a change in GGP's priorities, (ii) lack of adequate and on-time provision of data, (iii) delay in submission of required studies, (iv) delay in consultant selection, and (v) poor consultant performance. Efforts will be made to ensure timely recruitment of competent consultants. GGP agrees to provide adequate counterpart support and data when needed and to undertake and update all required studies according to a timetable agreed with ADB. Close coordination among the consultants, executing and implementing agencies, and ADB will further mitigate these risks.

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

17. Total cost of the TA is estimated at \$450,000 equivalent. The Government has requested that ADB provide \$300,000 to cover most of the TA cost. The TA will be financed on a grant basis by ADB's TA funding program. The Government will finance \$150,000 in-kind by providing counterpart staff, office space and facilities, and support services. The detailed cost estimates and a financing plan are in Appendix 3. The Government has been informed that approval of the TA does not commit ADB to finance any ensuing project.

### **D. Implementation Arrangements**

18. The TA will be carried out by a team of consultants with experience in (i) institutional, economic, financial, environmental, and social analyses; and (ii) impact evaluation and monitoring. The international consultants will include (i) an energy economist, (ii) a financial/financial management and institutional specialist, and (iii) a social and resettlement specialist. The national consultants will include (i) an energy economist, (ii) an environmental specialist, (iii) a social and resettlement specialist, and (iv) a financial and institutional specialist. National consultants will assist the international consultants in their respective fields. The consultants will be engaged in accordance with the *Guidelines on the Use of Consultants by Asian Development Bank and Its Borrowers*, and other arrangements satisfactory to ADB for the selection and engagement of national consultants. The services of consultants will be provided through a consulting firm selected using the quality- and cost-based selection method, following submission of simplified technical proposals. An estimated total of 25 person-months of consulting services will be required: 5 for international and 20 for national consultants. The outline terms of reference for consultants are in Appendix 4.

19. GGP will be the executing agency (EA) for the TA. A project management office (PMO), under the Finance Bureau of Guangdong Province, will provide interpreters, local transportation, and office space in Guangzhou equipped with suitable facilities, and coordinate with the consultants during the project preparatory TA work. The Guangdong Provincial Economic and Trade Commission will assist the PMO in project preparation and implementation by establishing a project office comprising specialists in the relevant areas, who will coordinate with the consultants. Office equipment financed under the TA will be procured in accordance with ADB's *Procurement Guidelines*, and will be given over to GGP upon completion of the TA. The TA is expected to begin in September 2006 and be completed by June 2007.

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

20. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of \$300,000 on a grant basis to the Government of the People's Republic of China for preparing the Energy Conservation and Resource Management Project, and hereby reports this action to the Board.

## DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
<p><b>Impact</b></p> <p>Improved energy efficiency in Guangdong Province</p>	<p>Investments in energy conservation by 2012 (detailed targets to be set during technical assistance [TA] implementation)</p> <p>Decrease in energy intensity in project areas by 2012 (detailed targets to be set during TA implementation)</p>	<p>National and provincial statistics and regional data</p> <p>Annual reports by companies concerned</p>	<p><b>Assumptions</b></p> <ul style="list-style-type: none"> <li>• TA design implemented effectively</li> <li>• TA recommendations disseminated to all parties concerned and agreement reached on development of an appropriate policy and regulatory framework and development of an energy conservation demonstration project</li> </ul>
<p><b>Outcome</b></p> <p>Project design, feasibility study, and implementation arrangements agreed</p>	<p>Memorandum of understanding of final tripartite meeting signed by the Government and the Asian Development Bank (ADB)</p>	<p>Consultant's final report</p> <p>Memorandum of understanding</p> <p>Back-to-office report of final TA review mission</p>	<p><b>Assumptions</b></p> <ul style="list-style-type: none"> <li>• Effective stakeholder participation and ownership developed</li> <li>• Adequate support by national and provincial government agencies concerned for implementing an appropriate policy and regulatory framework for energy conservation projects and for developing an energy conservation demonstration project</li> </ul> <p><b>Risks</b></p> <ul style="list-style-type: none"> <li>• Change of Government priorities and delay in adopting proposed policy and regulatory framework</li> <li>• Inadequate counterpart support, lack of adequate information, and untimely provision of data</li> </ul>
<p><b>Outputs</b></p> <p>1. Strategy for selected areas and project scope agreed</p> <p>2. Project assessments completed</p>	<p>Government, development partners, and nongovernment organizations endorse strategy and project scope</p> <p>Inception report (week 4) Draft final report (week 16) Final report (week 34)</p>	<p>Strategy report</p> <p>Endorsement of support</p> <p>Project reports TA reviews (weeks 6, 18, and 36)</p>	<p><b>Assumptions</b></p> <ul style="list-style-type: none"> <li>• No restriction on availability and access to timely information and personnel</li> <li>• No restriction on accessing geographic sites</li> </ul>

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
3. Project design requirements met	Inception report (week 4) Draft final report (week 16) Final report (week 34)	Project reports Technical assistance reviews (weeks 6, 18, and 36)	<b>Assumption</b> <ul style="list-style-type: none"> <li>No restriction on availability of data, access to timely information, and adequate support by counterpart staff</li> </ul>
<b>Activities with Milestones</b> <ol style="list-style-type: none"> <li>Analyze growth and development, and assess energy conservation links to economy and poverty reduction (weeks 1–4).</li> <li>Assess adequacy of environmental policy and measures (weeks 5–8).</li> <li>Carry out stakeholder consultations (week 6).</li> <li>Complete a baseline survey (week 6).</li> <li>Carry out social, poverty, ethnic minority, and gender assessment (weeks 8–10).</li> <li>Carry out financial and economic analyses, and risk and institutional analyses (weeks 10–14).</li> <li>Complete summary initial environmental examination and preparation and submission of the resettlement plan (week 10).</li> <li>Prepare participation plans and private sector participation development plan (weeks 10–14).</li> <li>Prepare problem analysis and project framework (week 10).</li> <li>Finalize project design and monitoring framework (weeks 15–16).</li> </ol>			<b>Inputs:</b> \$450,000  <b>ADB: \$300,000</b> <ul style="list-style-type: none"> <li>Consultants: \$247,100</li> <li>Equipment: \$6,000</li> <li>Survey: \$20,000</li> <li>Contingencies—\$26,900</li> </ul> <b>Government: \$150,000</b> <ul style="list-style-type: none"> <li>Office Accommodation and Transport: \$50,000</li> <li>Personnel: \$40,000</li> <li>Workshops: \$30,000</li> <li>Others: \$30,000</li> </ul> <b>Financing:</b> ADB: \$300,000 Government: \$150,000

ADB = Asian Development Bank, TA = technical assistance.

## INITIAL POVERTY AND SOCIAL ANALYSIS

### A. Linkages to the Country Poverty Analysis

<b>Is the sector identified as a national priority in country poverty analysis?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>Is the sector identified as a national priority in country poverty partnership agreement?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Contribution of the sector or subsector to reduce poverty in the People's Republic of China:</b> <p>The project will promote energy conservation. By conserving energy, the project will assist the Government in meeting its responsibility to provide for the basic energy needs of the poor and reduce environmental pollution, which has a disparate impact on the poor.</p>	

### B. Poverty Analysis

**Targeting Classification:** General intervention

<b>What type of poverty analysis is needed?</b> <p>Basic poverty and social analysis is proposed (Appendix 4). The technical assistance (TA) will assess the incidence of poverty using existing data sources, supplemented by a social survey of potential beneficiaries. Both income and nonincome poverty indices will be determined. The analysis will be carried out following the <i>Handbook on Poverty and Social Analysis</i><sup>a</sup> and <i>Handbook for Integrating Poverty Impact on Economic Analysis of Projects</i>.<sup>b</sup> Particular attention is to be given to (i) profiling the beneficiaries, including gender-disaggregated demographic, economic, and social data where possible; (ii) determining the incidence of poverty; and (iii) identifying vulnerable groups and any adverse impacts anticipated from the project.</p>
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### C. Participation Process

<b>Is there a stakeholder analysis?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <p>A stakeholder analysis will be prepared as part of the TA. Participatory workshops will be held to strengthen the participatory approach. A workshop will be held for stakeholders to discuss and agree on the strategic plan, and the proposed investment project of the Asian Development Bank (ADB). In addition, workshops for local governments and communities will continue during the project design formulation process. More intensive focus group meetings, interviews, and surveys will be held with local government agencies, development partners, and nongovernment organizations, private sector, and identified project beneficiaries to ensure a sense of ownership and agreement with the detailed design and implementation arrangements. Funds are being made available under the TA to ensure an effective stakeholder analysis is undertaken.</p>
<b>Is there a participation strategy?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <p>A participation strategy will be prepared as part of the TA. This strategy will aim to ensure the involvement of local government and communities, and particularly the poor, women, ethnic minorities, and vulnerable groups. The strategy will ensure engagement with people who might be adversely affected by the project.</p>

### D. Gender Development

<b>Strategy to maximize impacts on women:</b> <p>The project will achieve gender equality during implementation in the hiring of construction laborers. The impact of the project on households headed by women will be examined during the TA.</p>
<b>Has an output been prepared?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <p>A strategy to maximize impacts on women will be prepared as part of the TA.</p>

**E. Social Safeguards and Other Social Risks**

<b>Item</b>	<b>Significant/ Not Significant/ None</b>	<b>Strategy to Address Issues</b>	<b>Plan Required</b>
<b>Resettlement</b>	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	There may be insignificant land acquisition and resettlement impacts. However, a short resettlement plan will be prepared during the TA and is reflected in the terms of reference for consultants (Appendix 4).	<input type="checkbox"/> Full <input checked="" type="checkbox"/> Short <input type="checkbox"/> None
<b>Affordability</b>	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	The issue of affordability will be considered during the social survey and the initial environmental examination and appropriate mitigation measures will be prepared as necessary.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Labor</b>	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	A reemployment plan may need to be prepared for workers affected by the project. Additional funds are included in the TA budget to assess the need for a plan.	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Indigenous Peoples</b>	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	The project is located in Guangdong Province, which has only a small population of ethnic minorities. The need for an ethnic minority plan will be assessed during the TA and is reflected in the terms of reference for consultants (Appendix 4).	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Other Risks and/or Vulnerabilities</b>	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	The issue will be considered during the social survey and the initial environmental examination, and appropriate mitigation measures prepared as necessary.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

<sup>a</sup> ADB. 2001. *Handbook on Poverty and Social Analysis*. Manila.

<sup>b</sup> ADB. 2001. *Handbook for Integrating Poverty Impact on Economic Analysis of Projects*. Manila.

**COST ESTIMATES AND FINANCING PLAN**  
(\$'000)

<b>Item</b>	<b>Total Cost</b>
<b>A. Asian Development Bank (ADB) Financing<sup>a</sup></b>	
1. Consultants	
a. Remuneration and Per Diem	
i. International Consultants	95.9
ii. Domestic Consultants	126.0
b. International and Local Travel	15.0
c. Reports and Communications	7.9
2. Equipment <sup>b</sup>	6.0
3. Surveys	20.0
4. Miscellaneous Administration and Support Costs	2.3
5. Contingencies	26.9
<b>Subtotal (A)</b>	<b>300.0</b>
<b>B. Government Financing</b>	
1. Office Accommodation and Transport	50.0
2. Remuneration and Per Diem of Counterpart Staff	40.0
3. Training, Seminars, and Conferences	30.0
4. Others	30.0
<b>Subtotal (B)</b>	<b>150.0</b>
<b>Total</b>	<b>450.0</b>

<sup>a</sup> Financed by ADB's technical assistance funding program

<sup>b</sup> Including two Pentium computers, a laser printer, and a fax machine.

Source: ADB estimates.

## OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The consultants will evaluate the results and recommendations of the TA.<sup>1</sup> The terms of reference for consultants include the following.
2. The financial management and institutional analysts (one international and one national consultant) will undertake the following tasks.
  - (i) Carry out financial analysis in accordance with the *Guidelines for the Financial Management and Analysis of Projects* and the financial management assessment questionnaire. Review the accounting and financial records of the project implementation agencies (PIAs). Present the key audited financial statements for the past 5 years in Asian Development Bank (ADB) format. Carry out a detailed review of the financial position of PIAs for the last 5 years, based on international accounting standards. Project their financial positions for the next 10 years, stating the assumptions used; present the projected financial performance in ADB format. Evaluate the possibility of future private sector participation in energy conservation. Examine the financial feasibility of the investment plan of the Executing Agency (EA) and PIAs for the next 10 years. Recommend measures to improve their financial positions. Review the project cost estimates and financing plan. Discuss the methodology for assessing the financial viability of the project and each of its components.
  - (ii) Determine the financial viability of the project and each of its components; include a computation of the project's financial internal rate of return and the weighted average cost of capital, as well as a review of the potential cash flows of the project in accordance with ADB guidelines. Assess the likely financial uncertainties and risks associated with the project, and carry out a sensitivity analysis to determine the viability of the project and its components under these risks and uncertainties. Review internal controls within the EA and the PIAs to ensure they are consistent with ADB's anticorruption policy.<sup>2</sup> Present the recommended organizational structure of the finance departments of the EA and PIAs. Propose a capital/ownership structure for the PIAs and develop a financial reporting system that will enable the EA to monitor the financial performance of the PIAs.
  - (iii) Describe (a) the role and responsibilities of the various sector institutions, (b) their relationships, and (c) the relationship to the EA, the PIAs, and the provincial and local governments. Present the delegation of authority in key areas such as corporate governance, long-term planning, investment approval, appointment of key personnel, setting of performance targets, and monitoring of performance. Prepare a chart showing the institutions and their relationships. Present the number of staff and staffing pattern in the EA and the PIAs and categorize the staff and their available skills. Present the corporate objectives and goals of the EA and the PIAs. Assess how the enterprise reforms can be achieved within the framework of corporate long-term goals and objectives.
  - (iv) Recommend institutional strengthening measures addressing organizational structure, corporate governance, operational efficiency, delegation of power, and greater commercialization. Recommend measures for strengthening the organizational aspects of project implementation arrangements, including the role of the EA and the PIAs in project implementation. Assess their capabilities to manage

<sup>1</sup> ADB. 2005. *Technical Assistance to the People's Republic of China for Energy Conservation and Resource Management*. Manila (TA 4706-PRC, approved in December).

<sup>2</sup> ADB. 1998. *Anticorruption Policy*. Manila.

the project. Identify key issues and evaluate the prospects for private sector participation in the project. Recommend commercial arrangements for efficient utilization and better cost recovery. Identify areas where the EA and the PIAs require assistance for institutional strengthening, including corporate governance and enterprise reforms. Identify suitable training programs for EA and PIA staff.

- (v) Review and assess the current status of private sector participation in energy conservation in Guangdong Province and identify institutional, regulatory, financial, and other barriers to private sector participation. Undertake resource and skills audits of project companies to identify their financial and management capacity, and prepare a comprehensive capacity enhancement program to bridge identified skill and resource gaps. Review and assess the level of commercialization in existing operations, and develop an enterprise reform plan and a time-bound action plan for project companies to prepare them for full commercialization of their operations.
  - (vi) Identify, prioritize, and rank areas of operation for divestment. Prepare a divestment action plan for the first-ranked area that evaluates divestment options. Prepare a time-bound action plan for private sector participation in the selected project companies. Determine project financing requirements in terms of both local cost and foreign exchange requirements, and identify options for cofinancing, including economical cofinancing under ADB guarantee operations.
5. The energy economists (one international and one national consultant) will undertake the following tasks.
- (i) Provide general macro and sector information, including energy production and consumption by sector and energy efficiency by sector, for the PRC and Guangdong Province. Analyze the project's sectoral and policy context. Provide an independent assessment of short-term (3 years) and long-term (system planning period) demand forecasts, that takes into account historical trends, structural changes, efficiency improvements, energy prices, gross domestic product growth, investment distribution and growth, and other important factors affecting energy demand in Guangdong Province. Investigate nontechnical alternatives, such as, time-of-use pricing to reduce peak system load.
  - (ii) Analyze government policies that may have a significant impact on energy demand and supply. Provide a detailed discussion of the assumptions and methodology used in demand forecasting. Make a comparison, in terms of economic costs and benefits, between the proposed use of energy and its alternative uses in project cities. Analyze the economic parameters. Provide the quantitative and qualitative benefits of the project and each of its components. Carry out an economic analysis based on ADB's *Guidelines for Economic Analysis of Projects*,<sup>3</sup> specifically including (a) demand analysis, (b) least-cost and equalizing discount rate analysis, (c) economic viability analysis, and (d) risk analysis. Discuss alternative methodologies for carrying out the economic analysis, if needed. The economic viability of the various DSM options could be established with proper system expansion planning software.
  - (iii) Describe how project tariffs will be determined. Incorporate into the economic analysis an economic quantification of the project's environmental impact, following ADB's *Environmental Guidelines for Selected Industrial and Power Development Projects*,<sup>4</sup> *Environmental Assessment Requirements and Environmental Review*

<sup>3</sup> ADB. 1997. *Guidelines for Economic Analysis of Projects*. Manila.

<sup>4</sup> ADB. 1993. *Environmental Guidelines for Selected Industrial and Power Development Projects*. Manila

*Procedures*,<sup>5</sup> and *Economic Evaluation of Environmental Impacts: A Workbook* (1996).<sup>6</sup>

- (iv) Discuss the assumptions and the economic parameters used in the economic analysis, including the assumed consumers' willingness to pay and resource cost savings in relation to alternative options. Compare the shadow prices with those in ADB or the World Bank projects, and discuss the source of and justification for the shadow prices. Identify and analyze likely economic uncertainties that could affect the project's viability, and carry out a risk analysis.
6. The national environmental expert will undertake the following:
- (i) Prepare the environment impact assessment (EIA) and environment management plan (EMP) to ensure they conform to ADB's *Environment Policy and Guidelines*. Assist the EA to carry out further investigations and analysis, as required, and to finalize the EIA and EMP by incorporating the comments from ADB and the Environmental Protection Bureau. Prepare the summary EIA in accordance with ADB requirements and a loan processing schedule.
  - (ii) Assess environmental conditions in the project area through site investigation. Review the draft EIA and EMP to ensure that the investigation and analysis are adequate, impacts are quantified and appropriate mitigation measures and management procedures are specified. Assess the direct and indirect environmental impacts of the project resulting from construction activities or operation. Analyze the likely impact of emissions and suggest appropriate mitigation measures. Review the Government's policy and regulations to reduce emissions, and provide control measures.
  - (iii) The EIA should also include the benefits of proposed environmental enhancement measures, including the construction of drainage and planting of trees along the right-of-way. The consultant will (a) determine costs of the proposed environmental measures, (b) appraise the cost against expected environmental benefits, (c) assist in incorporating appropriate mitigating measures into the project design, and (d) prepare contractor specifications for environmental management and monitoring. In determining appropriate environmental standards, also refer to the World Bank's *Pollution Prevention and Abatement Handbook* (1998).
  - (iv) Assist the EA with public consultation and involvement during EIA preparation to promote broad-based acceptance of the report and ensure full disclosure. The EMP should also include proposed measures for public consultation and involvement during project construction. Provide training to EA staff on environmental management and monitoring.
7. The social and resettlement analysts (one international and one national consultant) will do the following:
- (i) Prepare socioeconomic and poverty profiles for the project area. Data will be collected through statistical records, field surveys and interviews with key informants (e.g., local government officials, poverty reduction offices, ethnic affairs bureaus, women's federation, business associations, and community groups) and participatory community appraisal techniques. The information should include population; income, unemployment and education levels; occupations; health conditions; transport expenditures; and other relevant socioeconomic data. Data

<sup>5</sup> ADB. 2003. *ADB Environmental Assessment Guidelines*. Manila.

<sup>6</sup> ADB. 1996. *Economic Evaluation of Environmental Impacts: A Workbook*. Manila.

should be disaggregated by gender. These data and profiles should be sufficiently comprehensive to serve as the baseline for socioeconomic performance indicators. Poverty incidence will be assessed based on government poverty lines and \$1 per day (equivalent to CNY900 per year). Conduct surveys to develop a profile of currently available transport services and their costs, and assess affordability for low-income groups.

- (ii) Review the government's poverty reduction and regional economic development policies, strategies and programs pertaining to the project area. Analyze how the proposed project will complement the government's ongoing and future development programs. Consult with local governments to identify development initiatives that could complement the project, particularly those targeted at the poor and ethnic minorities, and identify possible sources of funding for these initiatives.
- (iii) Based on the initial poverty and social analysis, conduct a full poverty and social analysis in accordance with ADB's *Handbook on Poverty and Social Analysis*. Assess how the proposed project may help improve people's livelihoods. Assess gender issues, identify vulnerable groups and recommend appropriate measures to address impacts and promote development opportunities during project construction, operation and maintenance. Estimate (a) the number of project beneficiaries by ethnicity and income level (poor, medium and high); and (b) the number of adversely affected people by type of impact. Quantify how the project will improve benefits (e.g., market access, employment opportunities, lower transport costs, and reduced travel time) for local people, by income group. If needed, incorporate recommended measures to enhance benefits and minimize adverse impacts, including cost and implementation arrangements, into an ethnic minorities development plan, to be implemented as part of the project.
- (iv) Assist in establishing consultative and participatory processes during project preparation that will continue throughout project design, construction and operation. Stakeholders should be identified and representatives consulted so their needs and demands can be considered for incorporation into the project or as parallel initiatives. Prepare a stakeholder participation and consultation report, providing details of consultation meetings. Prepare a participation plan for project implementation. If an ethnic minorities development plan is needed, assist the EA in disclosing the plan to local people. Provide on-the-job training to EA staff in social assessment, participatory community appraisal, consultation, and participatory monitoring techniques.
- (v) Prepare and review the draft resettlement plan and prepare modifications to comply with ADB's *Involuntary Resettlement Policy* (1995) and Operations Manual (OM) F2 on Involuntary Resettlement (2003). The resettlement expert will use ADB's *Handbook on Resettlement* (1998) as a guide in preparing the plan. The resettlement plan must include village-level impact assessment of project-affected people, income levels and its sources, land, assets and occupations. Identify potential impoverishment risks and vulnerable groups, including those severely affected through loss of land, those with low income, and others (e.g., disabled, elderly, ethnic minorities, unemployed, illiterate, women, children) and develop special mitigation measures, as required.
- (vi) Assess the policy and legal framework for resettlement, identify any gaps compared with ADB policy and propose measures to bridge the gap between the policies of ADB and the PRC. In collaboration with the EA and local government officials, define categories for impact and compensation eligibility of affected people, and prepare an entitlements matrix covering compensation and other assistance for all types of impacts to achieve full replacement for lost assets, income and livelihoods.

- The entitlements should be based on the PRC Land Administration Law, local government regulations and ADB's *Involuntary Resettlement Policy*.
- (vii) Assess and justify that (a) the compensation standards are based on replacement value, and (b) the overall resettlement budget is sufficient to implement the resettlement plan based on the proposed entitlements and rehabilitation plans. If land redistribution will be undertaken, confirm there is adequate land available for reallocation without negatively affecting the host population. If relocation sites will be developed, ensure that affected people are consulted on the selection of sites and provision of services. For any seriously affected villages, prepare village economic rehabilitation plans to restore incomes of affected people and host people. Identify compensation and rehabilitation options, and develop livelihood rehabilitation and improvement programs, in consultation with those affected. Assess and justify that the overall resettlement budget is sufficient to acquire the land and implement the resettlement plan.
  - (viii) Assist the EA to prepare a public consultation and disclosure plan, develop a format for documenting consultation with affected people and initiate a participatory process for resettlement plan preparation and implementation among affected communities, local leaders, proponents and other stakeholders. Assist the EA to prepare a resettlement information booklet for distribution to all affected villages and households. Chinese and Uygur versions of the plan should be distributed to all relevant local government offices and made available affected village leaders.
  - (ix) Review the organizational structure and capacity for resettlement implementation and recommend improvements and actions required before the start of land acquisition. Provide training to the EA and local government staff on ADB's *Involuntary Resettlement Policy* requirements and procedures. Assist the EA to prepare a detailed resettlement implementation schedule that is linked to the overall project schedule. A summary of milestones for resettlement supervision should be prepared. Develop an internal and external monitoring and evaluation plan, specifying key indicators of progress, mechanisms for reporting, resource requirements and database maintenance. Include a three-page executive summary in the resettlement plan.