



Technical Assistance Report

Project Number: 40634-03
Capacity Development Technical Assistance (CDTA)
December 2009

People's Republic of China: Energy Efficiency Improvements in Inner Mongolia Autonomous Region (Financed by the Climate Change Fund)

CURRENCY EQUIVALENTS

(as of 20 November 2009)

Currency Unit	–	yuan (CNY)
CNY1.00	=	\$0.1465
\$1.00	=	CNY6.826

ABBREVIATIONS

ADB	–	Asian Development Bank
DHS	–	district heating system
IMAR	–	Inner Mongolia Autonomous Region
PMO	–	project management office
PRC	–	People's Republic of China
TA	–	technical assistance

TECHNICAL ASSISTANCE CLASSIFICATION

Type	–	Capacity development technical assistance (CDTA)
Targeting classification	–	General intervention
Sector (subsectors)	–	Energy (energy utility services, energy efficiency and conservation)
Themes (subthemes)	–	Environmental sustainability (urban environmental improvement), capacity development (institutional development)
Climate change	–	Climate change mitigation
Location impact	–	Rural (medium), urban (high), national (low)

NOTE

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

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I. INTRODUCTION

1. The capacity development technical assistance (TA) was originally included in the approved project concept paper for the People's Republic of China (PRC) for the Inner Mongolia Autonomous Region (IMAR) Energy Efficiency and Environment Improvement Project, phase II as a grant component.¹ During subsequent discussions, the government and the Asian Development Bank (ADB) agreed to move the TA processing ahead of the project to immediately address some critical capacity gaps of local governments and implementing agencies in planning and managing the energy efficiency investment projects. This is to avoid potential start-up delays, which were experienced in a similar loan project in IMAR.² The TA scope and design were revised and adjusted to respond urgently to issues of inadequate capacity.³ During the fact-finding mission in November 2009, the mission and the government reached an agreement on the TA impact, outcome, activities, and implementation arrangements including the terms of reference for consultants.⁴ The design and monitoring framework is in Appendix 1.

II. ISSUES

2. IMAR is the third largest province in the PRC, covering 1.18 million square kilometers. But it has a population of only 24.15 million (2008 census), which is 1.8% of the national total population. The region represents some of the poorest areas in the PRC. The provision of reliable and affordable household heating is a basic necessity as temperatures can fall to -40° Celsius and the heating season can extend to 7 months. But the remoteness and low population density present unique challenges in district heating systems (DHSs). The district heating infrastructure consists largely of inefficient neighborhood coal-fired boilers with low capacity and efficiency, and an aging and poorly insulated pipe network that has high distribution losses. In many urban areas, DHSs installed in the 1970s have now exceeded their design lives, resulting in unreliable service. Inefficiencies in production, transmission, and distribution of heating services mostly impact the poorest in society. Also, the existing coal-fired boilers are highly polluting and lack emission-control devices, resulting in increased outdoor air pollution and causing significant harm to public health.

3. Due to aging and inefficient energy infrastructure, the IMAR economy is relatively energy inefficient, using 2.31 tons of standard coal equivalent per CNY10,000 of gross domestic product, or double the national average of 1.16 tons (2007). To comply with the national priority of the 11th Five-Year Plan to improve energy intensity by 20%, IMAR has a relatively high provincial target of 25%. IMAR depends heavily on coal, which accounts for more than 90% of primary energy supply and 95% of district heating supply. Reliance on coal has a high environmental cost for urban areas, with only 6 of 15 cities reaching the acceptable class II air quality standards (2008). Investing in new and more efficient urban energy efficiency projects including DHS will help IMAR reach the emission targets specified in the plan.⁵

4. To respond to the sector needs of improving energy efficiency, ADB has provided a loan (footnote 2) as part of the IMAR phase I project for DHSs in Byannur and Wuhai cities. A similar loan is being considered (IMAR phase II) to rehabilitate DHSs in other areas namely, Baotou,

¹ The \$600,000 grant was to be funded from the Climate Change Fund.

² ADB. 2006. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Inner Mongolia Autonomous Region Environment Improvement Project*. Manila.

³ The revised scope has ascertained funding of \$500,000

⁴ The TA first appeared in the business opportunities section of ADB's website on 18 November 2009.

⁵ The 11th five-year-plan target for sulfur dioxide emission reduction is 10%.

Chifeng, Hohhot, Kalakin, Keyouqian, and Zhalaite. The phase I project and the relevant TA⁶ addressed the capacity strengthening of relevant implementing agencies and the executing agency, the IMAR Finance Bureau. But during implementation of phase I, unfamiliarity of most of the implementing agencies with ADB project implementation requirements resulted in a 1 year start-up delay and subsequent slower implementation. Since the proposed IMAR phase II loan involves new implementing agencies, capacity strengthening is recognized as a critical barrier that may potentially delay phase II implementation and likely impact its sustainability. The TA will target local governments in Baotou, Chifeng, Hohhot, Kalakin, Keyouqian, and Zhalaite cities and selected implementing agencies to provide enhanced support during the start-up process and develop their capacity in planning and implementing similar energy efficiency projects. The TA will (i) enhance the project management and procurement capacity of the IMAR Finance Bureau and the project management office of the IMAR Development and Reform Commission, and the implementing agency on an urgent basis; (ii) develop monitoring and reporting procedures for improved verification of DHS projects; and (iii) investigate demand-side energy efficiency measures, and develop a best practice paper to address implementation strategies and public awareness material.

5. The TA is consistent with ADB's Strategy 2020⁷ to promote environmentally sustainable growth. It reflects the PRC country partnership strategy⁸ (2008–2010) and its pillars of resource efficiency and environmental sustainability. The TA supports ADB's Energy Efficiency Initiative to expand ADB investments in clean energy projects. It will build on continuing engagement with the IMAR government in the energy sector.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

6. The impact of the TA will be improved energy efficiency and environment in IMAR. The outcome will be enhanced capacity in planning and implementing energy efficiency projects.

B. Methodology and Key Activities

7. The TA outputs will be achieved by identifying relevant stakeholders in close coordination with the IMAR Finance Bureau and implementing agencies. A consultation plan will be prepared to assist in acquiring and disseminating information. The specific outputs comprise enhanced project management capacity in implementing DHS projects, development of (i) a monitoring and reporting procedure for DHSs, (ii) a best practice paper on demand-side conservation, and (iii) public awareness material.

8. The consultant will examine international best practices and methods to conserve energy in the district heating subsector, and combine these with the IMAR experience and expectations to develop an implementation strategy for demand-side conservation of energy. This strategy will be developed in a participatory manner seeking active participation of key stakeholders.

⁶ ADB. 2007. *Technical Assistance to the People's Republic of China for Preparing the Inner Mongolia Autonomous Region Environment Improvement Project (Phase II)*. Manila (TA 4951-PRC, approved on 10 July, for \$800,000).

⁷ ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.

⁸ ADB. 2008. *Country Partnership Strategy: People's Republic of China, 2008–2010*. Manila.

9. The major assumptions in relation to successful TA implementation include retention and maintenance of capacity developed within the stakeholder organizations, and continued government commitment to improve demand-side conservation in the district heating subsector.

10. The TA will be implemented in two parts to meet the urgent but diverse needs of the project planning and management aspects of energy efficiency investments. Part 1 will address the critical capacity strengthening needs of a group of diverse and widely dispersed implementing agencies in specific DHS implementation. This is directly relevant to avoid potential start-up issues with the IMAR phase II investment. Part 2 will mainly target provincial agencies in the overall planning and management aspects of demand-side management issues in IMAR. This part will enhance the sustainability of DHS and other energy efficiency projects in IMAR. The key activities of the TA will include the following:

- (i) Part 1: Project management capacity development will provide (a) project management training in DHS investment projects, and (b) assistance in overall procurement planning and preparation of essential procurement documentation.
- (ii) Part 2: Capacity development on monitoring, reporting, and demand-side energy conservation will (a) develop energy efficiency monitoring and reporting procedures for district heating, (b) develop a stakeholder consultation plan to address demand-side conservation in the heating subsector, (c) summarize international experiences including best practices on demand-side conservation in the heating subsector, (d) develop best practice implementation strategies and public awareness material on demand-side energy conservation most suited to IMAR based on stakeholder consultation and international best practice, (e) hold consultations with stakeholders and disseminate outputs through targeted workshops and seminars in close association with relevant government departments, and (f) conduct national and international study tours to provide practical demonstrations of DHS used in similar climatic and topographic conditions.

C. Cost and Financing

11. The total cost of the TA is estimated at \$700,000 equivalent. ADB will provide \$500,000 equivalent on a grant basis from the Climate Change Fund.⁹ The government will finance the remaining \$200,000 equivalent through in-kind contributions, including provisions for office accommodation and facilities, counterpart staff and data, and other information needed for the TA. The TA proceeds will be disbursed in line with ADB's *Technical Assistance Disbursement Handbook*.¹⁰ The cost estimates and financing plan are in Appendix 2.

D. Implementation Arrangements

12. The IMAR Finance Bureau will be responsible for day-to-day implementation of the TA activities, including coordination with other key stakeholders and logistic support to consultants. ADB will engage international and national consultants, in accordance with ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time). Three person-months of international consulting and 27 person-months for national consultants will be required. Part 1 will be implemented by three individually selected consultants to address the critical and

⁹ Established by ADB.

¹⁰ ADB. 2008. *Technical Assistance Disbursement Handbook*. Manila.

immediate project management capacity needs of the IMAR phase II investment projects. Since the subprojects are widely dispersed geographically, the team work is particularly challenging in IMAR cities. To overcome this, two procurement specialists (8 person-months) will be assigned to different geographic areas—Baotou, Hohhot on the western side of IMAR and Chifeng, Kalakin, Keyouqian, and Zhalaite on the eastern side—to address the weak capacity in procurement planning and bidding document preparation. This responds to a key lesson from similar projects in IMAR. The project management specialist (5 person-months) will train and support the project management office of the IMAR Development and Reform Commission in coordination of key planning and management issues with the implementing agencies and ADB. Since these tasks are essentially independent, immediately needed, and will be implemented by only three consultants, the individual consultant selection method is considered most appropriate as per ADB guidelines. For part 2, ADB will request use of the simplified technical proposal, and consultants will be recruited using the quality- and cost-based selection method (quality–cost ratio of 80:20).

13. Procurement of equipment, supplies, and materials by the TA consultants will follow ADB's *Procurement Guidelines* (2007, as amended from time to time). Since the TA activities are spread over a large geographic area, the equipment budget allocated for the TA is \$25,000 so that the consultants can be adequately supported in all their field activities. Any equipment purchased under the TA will be turned over to the IMAR Finance Bureau and/or the project management office after completion of the TA.

14. The TA will be implemented from January 2010 to June 2011. The consultants for part 2 will submit an inception report within 1 month; a draft final report within 6 months, and the final report within 7 months from the date of engagement. Information on the progress of implementation and on TA outputs will be disseminated through regular meetings and workshops. The TA outcome will be subject to evaluation by both ADB and the government in accordance with their respective evaluation policies and requirements.

IV. THE PRESIDENT'S DECISION

15. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of \$500,000 on a grant basis to the Government of the People's Republic of China for Energy Efficiency Improvements in Inner Mongolia Autonomous Region, 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>Impact Improved energy efficiency and environment in IMAR</p>	<p>IMAR achieves 12% energy intensity improvement by 2015 compared to 2009</p> <p>Air quality in all 15 cities in IMAR achieves PRC Class II standards by 2013</p>	<p>Annual environment monitored data published by IMAR and relevant cities and counties</p> <p>Local environment protection bureau reports</p>	<p>Assumption The IMAR phase II project is planned and implemented on a timely basis.</p> <p>Risk Air emission improvements are negated by the establishment of new polluting industries.</p> <p>Any future tariff reform on DHS does not take into account the recommendations of the best practice paper.</p>
<p>Outcome Enhanced capacity in planning and implementing energy-efficiency projects</p>	<p>Implementation of IMAR phases I and II projects on key project indicators improves from 2010</p> <p>Recommendations of monitoring and reporting procedure and best practice paper are considered by the government of IMAR by 2011</p>	<p>IMAR phase II project performance report</p> <p>Final TA report</p>	<p>Assumptions The capacity developed is retained and maintained within the stakeholder organizations.</p> <p>The government is willing and committed to improving demand-side conservation in the district heating subsector.</p> <p>Risk Low heating tariffs undermine investments and future reform</p>
<p>Outputs</p> <ol style="list-style-type: none"> 1. Enhanced project management capacity in implementing DHS projects 2. Monitoring and reporting procedure for district heating 3. Best practice paper consisting of strategies on demand-side conservation and development of public awareness material 	<p>Training workshop and seminars conducted by 2011</p> <p>Procedure developed by June 2011</p> <p>Best practice paper and public awareness and education material completed by June 2011</p>	<p>Consultants report on the workshops</p> <p>Endorsement note by IMAR</p> <p>Endorsement note by IMAR</p>	<p>Assumptions Consultants are engaged on time and given adequate resources.</p> <p>Outputs 2 and 3 will be shared with the National Development and Reform Commission and other development reform commissions of various provinces that use DHSs extensively.</p>

Activities with Milestones	Inputs
<p>1. Part 1: Project management capacity development</p> <p>1.1 Provide project management training to the project management office (January and July 2010).</p> <p>1.2 Provide assistance in preparation of procurement documentation (January 2010–June 2011, intermittent).</p>	<p>ADB: \$500,000</p> <p>Part 1: \$193,000</p> <p>Consultants: \$162,000</p> <p>Workshops, training, seminars, and conferences: \$20,000</p> <p>Contingencies: \$11,000</p>
<p>Activities with Milestones</p> <p>2. Part 2: Capacity development on monitoring, reporting, and demand-side energy conservation</p> <p>2.1 Develop energy efficiency monitoring and reporting procedures for the district heating (April–May 2010).</p> <p>2.2 Develop stakeholder consultation plan to address demand-side conservation in the heating subsector (June–July 2010).</p> <p>2.3 Summarize international experience including best practice methods on demand-side conservation in the heating subsector (June–July 2010).</p> <p>2.4 Develop best practice paper comprising implementation strategies and public awareness material on demand-side energy conservation based on stakeholder consultation and international experience (September 2010–December 2010).</p> <p>2.5 Hold consultation with stakeholders and disseminate outputs through targeted workshops and/or seminars in close association with relevant government departments (August 2010–June 2011).</p> <p>2.6 Provide study tour related to international experience on energy conservation practices in DHSs to be undertaken by relevant government officials under a plan to be reviewed by ADB (August 2010–June 2011).</p>	<p>Part 2: \$307,000</p> <p>Consultants: \$145,000</p> <p>Equipment: \$25,000</p> <p>Workshops, training, seminars, and conferences: \$80,000</p> <p>Miscellaneous administration and support costs: \$20,000</p> <p>Contingencies: \$37,000</p> <p>Government: \$200,000</p> <p>Office accommodation and transport: \$100,000</p> <p>Remuneration and per diem of counterpart staff: \$100,000</p>

ADB = Asian Development Bank, DHS = district heating system, IMAR = Inner Mongolia Autonomous Region, TA = technical assistance.

Sources: Asian Development Bank.

COST ESTIMATES AND FINANCING PLAN
(\$'000)

Item	Total Cost
A. Climate Change Fund for Part 1^a	
1. Consultants	
a. Remuneration and per diem	
i. National consultants	150.00
b. Local travel	10.00
c. Translation, reports, and communications	2.00
2. Workshops, training, seminars, and conferences	20.00
3. Contingencies	11.00
Subtotal (A)	193.00
B. Climate Change Fund for Part 2^a	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	75.00
ii. National consultants	35.00
b. International and local travel	25.00
c. Translation, reports, and communications	10.00
2. Equipment ^b	25.00
3. Workshops, training, seminars, and conferences	80.00
4. Miscellaneous administration and support costs	20.00
5. Contingencies	37.00
Subtotal (B)	307.00
C. Government Financing	
1. Office accommodation and transport	100.00
2. Remuneration and per diem of counterpart staff	100.00
Subtotal (C)	200.00
Total	700.00

^a Established by the Asian Development Bank.

^b Equipment includes one photocopier, two desktop computers, four laptop computers, and two cameras. Consultants will use the equipment during technical assistance implementation and provide it to the Inner Mongolia Autonomous Region Finance Bureau and the project management office of the Inner Mongolia Autonomous Region Development and Reform Commission once the technical assistance is completed.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The capacity development technical assistance (TA) will be implemented with two components in separate consulting services packages. Part 1 requires 21 person-months of national consulting services and part 2 requires 3 person-months of international and 6 person-months of national consulting services. The required experts and inputs in each component are provided in Table A3. Each component requires different consulting expertise, thus a blended approach of consultant selection methods will be utilized.

2. For part 1, individual consultant selection will be used as only three national positions for a total of 21 person-months are required for the assignment.

3. For part 2, international and national specialists will be engaged by the Asian Development Bank (ADB) through a consulting firm using simplified technical proposal procedures and quality- and cost-based selection method (with quality–cost ratio of 80:20) and in accordance with ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time).

A. Consulting Services for Part 1

4. **Project management specialist** (national, 5 person-months). The expert should have at least 10 years of work experience; experience with projects in the People's Republic of China (PRC) will be preferred. He/she should be fluent in English and able to communicate effectively with the Inner Mongolia Autonomous Region (IMAR) Finance Bureau, the executing agency, and the project management office (PMO) of the IMAR Development and Reform Commission, the implementing agency. The expert will undertake the following activities:

- (i) Propose a training plan to enhance PMO management capacity, knowledge of ADB loan disbursement and procurement procedures and related requirements, and submit to the PMO and ADB for review.
- (ii) Deliver the training to relevant staff from the PMO and implementing agencies.
- (iii) Examine the PMO institutional management status and procedures, and propose suitable reform measures relevant for successful design and implementation of district heating systems.
- (iv) Assist the PMO in monitoring the implementing agencies' institutional reform performance.
- (v) Prepare English and Chinese versions of periodic progress reports on performance monitoring.

5. **Two procurement specialists** (national, 8 person-months each). The experts should have the ability to coordinate the procurement process and activities for all procurement packages. They must have at least 10 years of working experience on similar projects, be knowledgeable of ADB procurement processes, be fluent in English, and able to communicate effectively with the IMAR Finance Bureau and the PMO. The experts will undertake the following activities:

- (i) Consult with the PMO to identify training needs and prepare a training plan for the review of PMO and ADB.
- (ii) Provide training to all relevant staff of the PMO and implementing agencies as per the training plan.
- (iii) Coordinate with the PMO to update and refine the procurement plan, if required.

- (iv) Review the bidding documents prepared by the implementing agencies and, if required, rectify the documents as per ADB requirements in coordination with the PMO staff.
- (v) Communicate effectively with the PMO, tendering company, and ADB during preparation of bidding documents.
- (vi) Assist implementing agencies in translating bidding documents to English and provide PMO translators with training to improve their capacity in understanding the process involved.
- (vii) Undertake due diligence of the bidding documents for national competitive bidding and international competitive bidding, and liaise with ADB on disclosure of the specific procurement notices for international competitive bidding.
- (viii) Undertake thorough review of the advance contracting documents, and instruct and coordinate with the PMO to submit the related documents required for retroactive financing from ADB.

B. Consulting Services for Part 2

6. **District heating and energy efficiency engineer (team leader)** (international, 3 person-months). The expert should have at least 10 years of working experience in district heating, including in the PRC; be fluent in English; and able to communicate effectively with the IMAR Finance Bureau and the PMO. The expert will undertake following activities:

- (i) Develop energy efficiency monitoring and reporting procedures for district heating.
- (ii) Identify relevant stakeholders and prepare a stakeholder consultation plan.
- (iii) Summarize international experience with demand-side energy conservation in the heating subsector and combine this with consultation outcomes to provide recommendations on implementation strategies for IMAR.
- (iv) Develop dissemination materials to increase public awareness.
- (v) Organize targeted workshops and/or seminars in close association with relevant government departments.
- (vi) Be responsible for quality checks of all final documentation.

7. **District heating engineer** (national, 6 person-months). The expert should have at least 10 years of working experience in district heating, be fluent in English, and able to communicate effectively with the IMAR Finance Bureau and the PMO. The expert will assist the team leader to undertake the following activities:

- (i) Assist the Team Leader in developing energy efficiency monitoring and reporting procedures for district heating.
- (ii) Summarize international experience of demand-side energy conservation in the heating subsector and combine this with consultation outcomes to provide recommendations on implementation strategies for IMAR.
- (iii) Develop dissemination materials to increase public awareness.
- (iv) Organize targeted workshops and/or seminars in close association with relevant government departments.

8. **Reporting requirements.** All required reports should be submitted in English and Chinese. The deliverables of these consulting services include the following:

- (i) **Inception report.** The report will be submitted within 1 month of TA commencement, summarizing the initial findings and suggesting changes needed (if any) in the TA approach, methodology, and time schedule.
- (ii) **Draft final report and workshop.** The draft final report will be submitted 6 months after the TA starts. It will cover all aspects of TA implementation. A stakeholder consultation workshop will be held to gauge current heating practices and obtain views on improving demand-side energy conservation. A workshop will be held to (a) present the international experience to policymakers and stakeholders and draft recommendations, (b) facilitate idea exchange and collect comments, and (c) increase ownership and commitment to the TA recommendations.
- (iii) **Final report and final workshop.** One month after the draft final workshop, the consultants will submit the final report, incorporating comments from the stakeholders present at the draft final workshop. The consultants will organize a final workshop with stakeholder participation to disseminate the TA findings and recommendations.

Table A3: Required Experts and Inputs

Position	Person-Months
A. Part 1	
1. National project management specialist	5
2. Two national procurement specialists	16
Subtotal (A)	21
B. Part 2	
1. Team leader (international district heating and energy efficiency engineer)	3
2. National district heating engineers	6
Subtotal (B)	9
Total	30

Source: Asian Development Bank.