Technical Assistance Report

Project Number: 49018-001
Policy and Advisory Technical Assistance (PATA)
August 2015

People's Republic of China: Modeling Urban Low-Carbon Development in Xiangtan

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 26 June 2015)

Currency unit	–	yuan (CNY)
CNY1.00	=	$0.1610
$1.00	=	CNY6.2090

ABBREVIATIONS

ADB	–	Asian Development Bank
GDP	–	gross domestic product
GHG	–	greenhouse gas
LCD	–	low-carbon development
NDRC	–	National Development and Reform Commission
PRC	–	People's Republic of China
TA	–	technical assistance
XMG	–	Xiangtan Municipal Government
XMOBTOS	–	Xiangtan Municipal Office for Building a Two-oriented Society

NOTE

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

Vice-President	S. Groff, Operations 2
Director General	A. Konishi, East Asia Department (EARD)
Director	S. Penjor, Urban and Social Sectors Division, EARD
Team leader	K. Katich, Urban Development Specialist, EARD
Team members	J. Bai, Associate Project Officer (Urban Development), People's Republic of China Resident Mission, EARD M. Guzon, Operations Assistant, EARD S. Ishii, Senior Urban Development Specialist, EARD B. Konysbayev, Principal Counsel, Office of the General Counsel

CONTENTS

POLICY AND ADVISORY TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data — **Project Number:** 49018-001

Project Name	Modeling Urban Low-Carbon Development in Xiangtan	**Department /Division**	EARD/EASS
Country Borrower	China, People's Republic of	**Executing Agency**	Xiangtan Municipal Government

2. Sector	**Subsector(s)**	**ADB Financing ($ million)**
✓ Multisector	ADB's corporate management, policy and strategy development	0.40
	Total	**0.40**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information**	
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Mitigation ($ million)	0.40
Environmentally sustainable growth (ESG)	Eco-efficiency	CO_2 reduction (tons per annum)	1
	Global and regional transboundary environmental concerns	Climate Change impact on the Project	Low
	Urban environmental improvement		

4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Knowledge solutions (KNS)	Application and use of new knowledge solutions in key operational areas	Some gender elements (SGE)	✓
	Knowledge sharing activities		

5. Poverty Targeting		**Location Impact**	
Project directly targets poverty	No	Rural	Low
		Urban	High

6. TA Category: B

7. Safeguard Categorization Not Applicable

8. Financing

Modality and Sources	Amount ($ million)
ADB	**0.40**
Policy and advisory technical assistance: Technical Assistance Special Fund	0.40
Cofinancing	**0.00**
None	0.00
Counterpart	**0.00**
None	0.00
Total	**0.40**

9. Effective Development Cooperation

Use of country procurement systems	No
Use of country public financial management systems	Yes

I. INTRODUCTION

1. The Government of the People's Republic of China (PRC) has requested policy and advisory technical assistance (TA) from the Asian Development Bank (ADB) to assist the Xiangtan Municipal Government (XMG) in strengthening its capacity to address climate change and pursue low-carbon development (LCD). A TA fact-finding mission on 1–3 February 2015 reached an agreement with the government on the impact, outcome, outputs, implementation arrangements, costs, financing arrangements, and terms of reference for the TA consulting services. The design and monitoring framework is in Appendix 1.[1]

II. ISSUES

2. Urbanization has been a key driver of economic development in the PRC for the last 35 years. The PRC's urbanization ratio increased from 19.4% in 1978 to 53.7% in 2013. From 1978 to 2013, the number of cities rose from 193 to 658, and the number of townships from 2,173 to 20,113.[2] Urbanization and industrialization have caused environmental degradation and pollution, limiting future options for sustainable urbanization in the PRC. Increasing air pollution and high labor costs in the eastern region of the PRC, coupled with the western development initiatives, have led to a shift of manufacturing from large coastal cities to small- and medium-sized cities in the central and western regions. These cities, which possess an abundance of labor and resources, tend to attract high-energy and pollution-heavy processing industries. While these industries allow for short-term economic growth, they ultimately sacrifice the long-term and environment-friendly development of these cities. Under the Eleventh Five-Year Plan, 2006–2010, the government set a goal to build a "two-oriented society" that will be both resource-conserving and environment-friendly.[3] This strategic task is critical for long-term planning for the national economy and social development.

3. Meanwhile, the PRC is becoming increasingly aware of the challenges posed by climate change to its continued development. Since the Twelfth Five-Year Plan, 2011–2015, the PRC's climate change initiatives include (i) implementing an action plan to control greenhouse gas emissions, (ii) adjusting the country's industrial structure and saving energy, (iii) increasing energy efficiency, (iv) optimizing the country's energy structure and increasing carbon sinks, and (v) adapting to climate change and intensifying capability building.[4] This has led to significant progress; in 2013 carbon dioxide emissions per unit of gross domestic product (GDP) were 4.3% lower than in 2012, and 28.56% lower than in 2005, equivalent to a cumulative reduction of 2.5 billion tons of carbon dioxide. Environmental protection measures are anticipated in the Thirteenth Five-Year Plan, 2016–2020.

4. The government sees urbanization as an opportunity to expand economic growth while promoting pollution-free and resource-efficient LCD. In 2013, ADB completed a policy and advisory TA, which aimed to assist the government in strengthening the capacity of small- and medium-sized cities to address climate change and pursue LCD through knowledge sharing.[5]

---

[1] The TA first appeared in the business opportunities section of ADB's website on 30 July 2015.

[2] World Bank. 2015. *East Asia's Changing Urban Landscape: Measuring a Decade of Spatial Growth. Urban Development Series.* Washington, DC.

[3] National People's Congress. 2006. *Eleventh Five-Year Plan for National Economic and Social Development (2006–2010).* Beijing.

[4] National People's Congress. 2011. *Twelfth Five-Year Plan for National Economic and Social Development (2011–2015).* Beijing.

[5] ADB. 2010. *Technical Assistance to the People's Republic of China: Strengthening Capacity to Address Climate Change for Small- and Medium-Sized City Development.* Manila.

The TA output alerted the government and the National Development and Reform Commission (NDRC) that low-carbon urban development of small- and medium-sized cities will face significant challenges, particularly in the areas of financing, knowledge, human resources, regulation, and infrastructure. The TA also identified national and international best practices best suited for small- and medium-sized cities in the PRC. Meanwhile, the NDRC identified 36 cities to undertake a wide range of pilot LCD tasks, such as developing citywide greenhouse gas (GHG) emission inventories, setting measurable emission reduction targets, developing low-carbon action plans, and establishing performance tracking mechanisms.[6]

5. In 2014, the government requested an additional policy and advisory TA from ADB to build on previous findings and apply the lessons learned in Xiangtan, Hunan Province. With a population of approximately 1 million, Xiangtan is a medium-sized city within the Changsha–Zhuzhou–Xiangtan city cluster, which was established in 2007 as one of the only two city cluster pilots aimed at exploring sustainable economic and social development in the PRC. Xiangtan was selected due to its size, location, and historical importance, as well as its existing political commitment to environmental improvement despite heavy industrialization.[7] While Xiangtan has made many efforts to advance local green and LCD initiatives such as closing many chemical plants that were polluting the Xiang River, it is not one of the 36 pilot LCD cities selected by the NDRC. The XMG has very broad pollution reduction targets, which aim to lower both air pollution and carbon emission, but at this time, comprehensive GHG data from Xiangtan is not available. XMG has requested guidance in measuring existing emissions and supporting the creation of a goal and workplan to ensure that international best practices are used to create a replicable model for small- and medium-sized cities in the PRC. While the LCD initiatives affect multiple sectors, the XMG has prioritized LCD planning for industrial development as Xiangtan's most urgent need. The proposed TA is a timely response to the government's request for ADB assistance to identify suitable policies and mechanisms to promote LCD in small- and medium-sized cities in the PRC.[8] The TA could also build on the ongoing PRC initiative, particularly development of the GHG accounting and monitoring framework. The TA also aims to identify innovative approaches to LCD projects in Xiangtan, which could lead to potential ADB lending.

6. The proposed TA aims to help XMG to promote energy efficiency and decrease carbon emissions per capita GDP in Xiangtan. Considering the existing lack of local carbon emission data, this will be achieved by two parallel work tracks, one focusing on GHG emissions and the other on the macro level of urban LCD planning. The first track will include the (i) creation of an

---

[6] The NDRC identified the pilot cities in two batches. The first, selected in 2010, included five provinces (Guangdong, Hubei, Liaoning, Shanxi, and Yunnan), two municipalities (Chongqing and Tianjin), and six cities (Baoding, Guiyang, Hangzhou, Nanchang, Shenzhen, and Xiamen). The second batch, selected in 2012, included Hainan Province, two municipalities (Beijing and Shanghai), and 26 cities (Chizhou, Daxinganling, Ganzhou, Guangyuan, Guangzhou, Guilin, Huaian, Hulunbeier, Jinchang, Jincheng, Jingdezhen, Jinlin, Jiyuan, Kunming, Nanping, Ningbo, Qingdao, Qinhuangdao, Shijiazhuang, Suzhou, Urumqi, Wenzhou, Wuhan, Yanan, Zhenjiang, and Zunyi).

[7] ADB. 2012. *Establishing a Pilot Center to Facilitate Climate Technology Investments in Asia and the Pacific: Promotion of Investment in Climate Technology Products through Venture Capital Funds (Subproject 1) (Supplementary)*. Manila; ADB. 2012. *Establishing a Pilot Center to Facilitate Climate Technology Investments in Asia and the Pacific: Integration of Climate Technology Financing Needs into National Development Strategies, Plans, and Investment Priorities (Subproject 3).* Manila. These two TA projects helped the Hunan Provincial Government mainstream climate technology into development and promote advanced climate technology investment by engaging the private sector. The outputs of these two TA projects can provide a foundation and useful input for the proposed TA.

[8] ADB. 2014. *Technical Assistance to the People's Republic of China for the Qingdao Smart Low-Carbon District Energy Project.* Manila; ADB. 2013. *Technical Assistance to the People's Republic of China for the Strengthening Capacity for Low-Carbon Development in Ningbo*. Manila. These two TA projects have supported LCD in the PRC. Lessons learned from these TA projects can provide useful input for the proposed TA.

inventory of current Xiangtan GHG emissions across all major sectors and (ii) the establishment of a GHG monitoring and accounting system. The second track, which will be informed by the results of the first track will include the creation of (i) an LCD index system for Xiangtan to measure LCD and environmentally friendly development; and (ii) a Xiangtan LCD strategy and implementation plan (LCD Road Map for Xiangtan), which could be used by similar small- and medium-sized cities in the PRC. Carbon emission measurements and reduction targets for all tasks will be measured against national standards (footnote 4).

7. The TA is closely aligned with ADB's strategic priorities as outlined in the Midterm Review of Strategy 2020, as well as with environmentally sustainable growth, the strategic pillar of ADB's country partnership strategy 2011–2015 for the PRC. By supporting the PRC's efforts to promote resource conservation, emission reduction, and environmental protection, this TA is fully aligned with ADB's Environment Operational Directions, 2013–2020 and Urban Operational Plan, 2012–2020.[9] The TA is also consistent with (i) the priorities of the government's Twelfth Five-Year Plan, 2011–2015 (footnote 4); (ii) the PRC's emphasis on achieving ecological civilization and commitment to curbing costs associated with resource depletion and environmental damage (as announced at the Third Plenum);[10] and (iii) the recently proclaimed concept of "greenization" of production, economy, and lifestyle.[11]

III. THE POLICY AND ADVISORY TECHNICAL ASSISTANCE

A. Impact and Outcome

8. The intended TA impacts will be (i) decreased carbon emission per capita GDP, and (ii) decreased energy consumption per unit of GDP in Xiangtan. The outcome of the TA will be an LCD model for Xiangtan that is recognized as an example for other small- and medium-sized cities in the PRC.

B. Methodology and Key Activities

9. The TA outputs will follow and be informed by internationally accepted and nationally appropriate methodologies.[12] The TA will have four outputs contributing towards the outcome and impact.

10. Output 1 will be an inventory of current Xiangtan GHG emissions across all major urban sectors (industry, transportation, building, and energy). This will entail (i) an investigation of the sources and quantities of GHG in Xiangtan by sector; and (ii) an assessment of policies and current practices of GHG management at the city, province, and regional levels. The assessment of relevant PRC policies, practices, and perceptions will be conducted through a

[9] ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific.* Manila; ADB. 2012. *Country Partnership Strategy: People's Republic of China, 2011–2015.* Manila; ADB. 2013. *Environment Operational Directions, 2013–2020: Promoting Transitions to Green Growth in Asia and the Pacific.* Manila; ADB. 2013. *Urban Operational Plan, 2012–2020*. Manila.

[10] The Third Plenum held on 9–12 November 2013 announced the Decisions on Major Issues Concerning Comprehensively Deepening Reforms, including the need to promote resources conservation, ecological environment protection, and modernization featuring harmonious development between man and nature.

[11] "Greenization" was a term coined by the Political Bureau of the Communist Party of China Central Committee in March 2015 to refer to making production, economy, and lifestyles more environmentally responsible.

[12] Such as: World Resources Institute. GHG Accounting Tool for Chinese Cities. http://www.ghgprotocol.org/chinese-city-tool; Atkins. Eco-Low Carbon Urban Planning Methodology. http://www.atkinsglobal.com/en-GB/group/sectors-and-services/services/future-proofing-cities/china

literature review and survey questionnaires of practitioners, academia, and professional associations. The results will be presented in a working paper as a GHG emissions baseline.

11. Output 2 will be a GHG monitoring and accounting system for Xiangtan. This will entail the creation of an appropriate, continuous data measurement and analysis system, as well as training for the XMG. The GHG monitoring system is expected to be subsumed within the broader LCD system when the latter is developed.

12. Output 3 will be an LCD index system for Xiangtan to measure LCD and environmentally friendly development. This will entail (i) identification of national and international good practices in LCD and air pollution reduction, (ii) identification of options for development with expected GHG emission reduction impact, and (iii) creation of a grading system to rate possible development outcomes. The results will be presented in a policy note on the LCD index system for Xiangtan.

13. Output 4 will be a Xiangtan LCD strategy and implementation plan that can be used by similar small- and medium-sized cities in the PRC. This output will include (i) a working paper on GHG emissions under business-as-usual and alternative scenarios completed for various sectors that considers peaking GHG emissions (Developing Xiangtan into a Green and Low-Carbon City); (ii) a seminar on the proposed LCD scenarios involving all stakeholders; and (iii) LCD Road Map for Xiangtan identifying key infrastructure investments to promote LCD in Xiangtan.

14. This TA assumes that (i) the government remains committed to promoting LCD, (ii) international experience and lessons regarding LCD can be adapted to the PRC context of small- and medium-sized cities, and (iii) the NDRC and other relevant national authorities remain committed to the TA activities and will provide timely guidance and support.

15. The main risks to the successful implementation of the TA are (i) inadequate or ill-timed provision of necessary data, and (ii) poor cross-agency and cross-sector coordination, potentially affecting consensus on proposed policies. To mitigate these risks, the recruitment and performance of the consultants will be monitored closely, and XMG has agreed to provide adequate counterpart support and all necessary data. Close coordination among the consultants, the executing and implementing agencies, and ADB, as well as the establishment of a project steering committee that includes key ministries, will further mitigate these risks.

C. Cost and Financing

16. The TA is estimated to cost $450,000, of which $400,000 will be financed on a grant basis from ADB's Technical Assistance Special Fund (TASF-other sources). The government will provide counterpart support in the form of counterpart staff, office accommodation, office supplies, secretarial assistance, domestic transportation, communication facilities for consultants, and other in-kind contributions. The Xiangtan Municipal Office for Building a Two-oriented Society (XMOBTOS) will provide a suitably furnished office with utilities and telecommunication access; materials, maps, data, and documents required for the TA; and the cost of utilities for the use of the consultants, counterpart professional staff, and support staff.

D. Implementation Arrangements

17. The TA will be implemented from 1 September 2015 to 31 January 2017. The XMG will be the executing agency for the TA, and the XMOBTOS will be the implementing agency.[13] The XMOBTOS will be responsible for coordination and providing information and other necessary conditions for the consultants to complete their tasks. A TA management office will be established within the XMOBTOS, and the agency's director will serve as the director of the TA management office responsible for coordinating day-to-day operational matters among ADB, the consultants, and related government agencies (the XMG and NDRC, among others).

18. It is expected that 24 person-months (7 international and 17 national) of consulting services will be required (see the table below for a list of required project expertise). The consulting firm will be selected by (i) using the quality- and cost-based selection method, with a quality–cost ratio of 90:10, and (ii) inviting simplified technical proposals.[14] The consultants' terms of reference are in Appendix 3. The TA requires highly qualified international and national experts in the fields of LCD, energy management, and climate change mitigation. These experts will be required to demonstrate strong experience in and familiarity with climate change mitigation and policies for cities in the context of the PRC and Asia. The consultants will be engaged according to ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). Proceeds of the TA will be disbursed in accordance with the *Technical Assistance Disbursement Handbook* (2010, as amended from time to time).

Summary of Consulting Services Requirement

International Name of position	Person-months	National Name of position	Person-months
Urban management specialist and team leader	7	Climate mitigation specialist and deputy team leader	9
		Energy management specialist	4
		Environmental economist	4
Total	**7**	**Total**	**17**

Source: Asian Development Bank.

IV. THE PRESIDENT'S DECISION

19. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of $400,000 on a grant basis to the Government of the People's Republic of China for Modeling Urban Low-Carbon Development in Xiangtan, and hereby reports this action to the Board.

[13] The XMOBTOS is a submunicipal-level agency focused on building a resource-conserving and environment-friendly society in Xiangtan.

[14] To reduce administrative burden and improve economy, efficiency, and value for money, all consulting services under the TA would be engaged on output-based (lumpsum) contracts.

DESIGN AND MONITORING FRAMEWORK

Impacts the project is aligned with:

Carbon emission per capita GDP in Xiangtan decreased (Twelfth Five-Year Plan, 2011–2015)[a]

Energy consumption per unit of GDP in Xiangtan decreased (Twelfth Five-Year Plan, 2011–2015)[a]

Project Results Chain	Performance Indicators with Targets and Baselines	Data Sources or Reporting Mechanisms	Risks
Outcome Xiangtan model for LCD recognized as an example for other small- and medium-sized cities in the PRC	**By 2017** a. Incorporation of policy recommendations proposed by this TA into the Xiangtan and Changsha–Zhuzhou–Xiangtan city cluster development plans (2015 baseline: NA)	a. Xiangtan and the Changsha–Zhuzhou–Xiangtan city cluster development plans (2021–2025)	Local line agencies are unable or unwilling to change existing systems quickly Insufficient resources to support low-carbon program
Outputs 1. Inventory of current Xiangtan GHG emissions across all major urban sectors completed	1a. Working paper presenting the results of the GHG emission inventory by the end of month 5 (2015 baseline: NA)	1a. TA review mission outputs (memorandum of understanding or aide-mémoire)	Data is not provided on a timely basis Poor cross-agency and cross-sector coordination
2. GHG monitoring and accounting system for Xiangtan established	(2015 baselines: NA) 2a. Creation of a GHG monitoring and accounting platform by the end of month 9 2b. Participation of at least two technical staff (50% female) from each line agency in GHG monitoring and accounting system training, and provision of positive evaluation by the end of month 15	2a. TA review mission outputs (memorandum of understanding or aide-mémoire) 2b. Training workshop course evaluation survey reports	
3. LCD index system for Xiangtan to measure LCD and environmentally friendly development created	3a. Policy note based on international good practices presenting the LCD index system for Xiangtan prepared by the end of month 4 (2015 baseline: NA)	3a. TA review mission outputs (memorandum of understanding or aide-mémoire)	
4. Xiangtan LCD strategy and implementation plan created	(2015 baselines: NA) 4a. Working paper on GHG emissions under business-as-usual and alternative scenarios completed for various sectors by the end of month 8 4b. Seminar with all stakeholders on the proposed LCD scenarios in month 10 4c. LCD Road Map for Xiangtan created and opportunities and strategies for LCD identified by the end of month 15	4a-c. Final consultant reports 4a-c. TA review mission outputs (memorandum of understanding or aide-mémoire)	

Key Activities with Milestones

1. Complete an inventory of current Xiangtan greenhouse gas emissions across all major urban sectors

1.1 Identify existing sources of data for emissions (Direct: CO_2, CH_4, N_2O, SF_6, PFCs; Indirect: NO_X, CO, NMVOC, SO_2) by the end of month 1.
1.2 Collect and analyze relevant data and information on GHG emissions by the end of month 4.
1.3 Present working paper results of the GHG emission inventory by the end of month 5.

2. Establish a greenhouse gas monitoring and accounting system

2.1 Review international and national examples of GHG monitoring and accounting systems by month 6.
2.2 Adopt or establish a continuous data measurement and analysis system by the end of month 9, and monitor emissions in accordance with required National emission standards.
2.3 Train at least two technical staff (50% female) from each line agency in the GHG monitoring and accounting system by the end of month 15.

3. Create a low-carbon development index system for Xiangtan to measure environment-friendly and low-carbon urban development

3.1 Identify green or LCD indices or measurement systems for cities by the end of month 1.
3.2 Review findings from the policy and advisory TA, "Strengthening Capacity to Address Climate Change for Small- and Medium-Sized City Development" by the end of month 1.
3.3 Present ongoing work and methodology for future outputs at an inception workshop in month 2.
3.4 Draft an LCD index system by the end of month 3.
3.5 Research and prepare the policy note on the LCD index system for Xiangtan, to be completed by the end of month 4.

4. Create a Xiangtan low-carbon development strategy and implementation plan: a low-carbon development Road Map for Xiangtan

4.1 Research and prepare a working paper on GHG emissions under business-as-usual and alternative scenarios for various sectors by the end of month 8.
4.2 Organize a seminar (interim workshop) with all stakeholders on the proposed LCD scenarios in month 10.
4.3 Prepare an LCD Road Map for Xiangtan, identifying opportunities and strategies for LCD, to be completed by the end of month 13.
4.4 Organize a final workshop to review the LCD Road Map by the end of month 15.

Inputs:

ADB: $400,000 (grant)

Note: The government will provide counterpart support in the form of counterpart staff, office accommodation, office supplies, secretarial assistance, domestic transportation, communication facilities for consultants, and other in-kind contributions.

Assumptions for Partner Financing:

Not applicable.

ADB = Asian Development Bank, CH_4 = methane, CO = carbon monoxide, CO_2 = carbon dioxide, GDP = gross domestic product, GHG = greenhouse gas, LCD = low-carbon development, N_2O = nitrous oxide, NA = not applicable, NMVOC = non-methane volatile organic compound, NO_X = mono-nitrogen oxide, PFC = perfluorinated chemical, PRC = People's Republic of China, SF_6 = sulfur hexafluoride, SO_2 = sulfur dioxide, TA = technical assistance.

[a] Government of the People's Republic of China, Central Committee of the Communist Party of China. 2011. *Twelfth Five-Year Plan for National Economic and Social Development, 2011–2015*. Beijing.

Source: Asian Development Bank.

COST ESTIMATES AND FINANCING PLAN
($'000)

Item	Amount
Asian Development Bank[a]	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	160.0
ii. National consultants	120.0
b. International and local travel	20.0
c. Reports, translation, and communication[b]	30.0
2. Trainings, workshops, seminars, and conferences	30.0
3. Surveys and data collection	5.0
4. Miscellaneous administration and support costs[c]	5.0
5. Contingencies	30.0
Total	**400.00**

Note: The technical assistance (TA) is estimated to cost $450,000, of which contributions from the Asian Development Bank (ADB) are presented in the table above. The government will provide counterpart support in the form of counterpart staff, office accommodation, office supplies, secretarial assistance, domestic transportation, communication facilities for consultants, and other in-kind contributions. The value of governmental contribution is estimated to account for 11% of the total TA cost.

[a] Financed by ADB's Technical Assistance Special Fund (TASF-other sources).

[b] This includes the creation of a greenhouse gas monitoring and accounting system.

[c] Other nonspecific costs, which cannot be included in other line items, such as editing charges, travel of ADB staff for workshops, etc.

Source: Asian Development Bank's estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Introduction

1. The policy and advisory technical assistance (TA) includes four key outputs: (i) an inventory of current Xiangtan greenhouse gas (GHG) emissions across all major urban sectors; (ii) a low-carbon development (LCD) index system for Xiangtan to measure LCD and environmentally friendly development; (iii) a GHG monitoring and accounting system for Xiangtan; and (iv) a Xiangtan LCD strategy and implementation plan. The TA will be implemented over 17 months from 1 September 2015 to 31 January 2017, with a draft final report to be submitted within 12 months after mobilization of the consultants on 31 August 2016.

2. The consultants will be engaged through a firm by the Asian Development Bank (ADB) according to ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). It is estimated that the TA will require one international consultant (7 person-months) and three national consultants (for a total of 17 person-months). The international consultant will be an urban management specialist and act as team leader. The national consultants will comprise a climate mitigation specialist and deputy team leader (9 person-months), an energy management specialist (4 person-months), and an environmental economist (4 person-months). The consultants will be responsible for producing the TA outputs and deliverables effectively and on time, and for organizing and carrying out all indicated tasks. All reports are to be of high quality and produced in English and Chinese. The consultants will also administer the training, workshops, and seminars required by the TA. A detailed work timeline and dates of deliverables will be defined at inception, documented in the final inception report, and agreed upon with the Xiangtan Municipal Government (XMG), the Xiangtan Municipal Office for Building a Two-oriented Society (XMOBTOS), and ADB.

B. International Consultant

3. **Urban management specialist and team leader** (7 person-months). The specialist should have a postgraduate degree or equivalent in urban management, urban environmental policy, and urban governance. The specialist should also have over 10 years of international professional experience in urban climate mitigation, GHG emissions, LCD, or related policy areas. The specialist should demonstrate good knowledge of and strong research experience in cleaner production and resource efficiency in the industrial sector, waste management, and policy formulation, including cost–benefit analysis of policy implementation. The specialist will have a proven track record of managing research and TA projects, and producing high-quality publications. Demonstrated project-related experience in the People's Republic of China (PRC) is preferred. As team leader, the specialist will be responsible for coordinating and supervising project activities and outputs. The specialist will undertake the following tasks:

(i) Prepare a detailed study framework work plan for the TA in consultation with the XMG, XMOBTOS, key stakeholders, and other experts.
(ii) Provide guidance and ensure that the team's work progresses according to schedule; and that TA inception, interim, draft final, and final reports as well as other outputs are of acceptable quality and submitted on time to the XMG, the XMOBTOS, and ADB.
(iii) Review and summarize findings and lessons from previous related ADB TA project on LCD in the PRC.[1]

[1] ADB. 2010. *Technical Assistance to the People's Republic of China for Strengthening Capacity to Address Climate Change for Small- and Medium-Sized City Development.* Manila.

(iv) Lead a critical review of the best international examples of green or LCD indices or measurement systems including technical, financial, and political requirements for implementing those best practices and policies.
(v) Lead the preparation of TA output 3, an LCD index system for Xiangtan.
(vi) Draft a policy note on the LCD index system for Xiangtan.
(vii) Lead the preparation of TA output 4 (an LCD Road map for Xiangtan).
(viii) Prepare a working paper on GHG emissions under business-as-usual and alternative scenarios across various sectors (Developing Xiangtan into a Green and Low-Carbon City).
(ix) Organize and facilitate all workshops, conferences, and symposiums to present key findings.
(x) Support the XMOBTOS in defining and implementing a knowledge dissemination strategy.

C. National Consultants

4. **Climate mitigation specialist and deputy team leader** (9 person-months, intermittent). The specialist should have a postgraduate degree or equivalent in economics, environmental science, urban planning and management, or a related field. The specialist should have (i) at least 10 years of professional experience in climate mitigation or GHG reduction in industrial cities; (ii) a specialization in at least one of the following sectors: industry, transportation, building, or energy; and (iii) expertise in GHG inventories, monitoring, and accounting. The specialist will assist the team leader in coordinating and supervising the TA, and will be responsible for day-to-day liaison with the XMG, XMOBTOS, and other government agencies to facilitate TA implementation. Advanced oral and written English skills are required. The specialist will undertake the following tasks:

(i) Assist the team leader in developing a detailed study framework work plan in consultation with the XMG, XMOBTOS, key stakeholders, and other experts.
(ii) Act as main liaison officer with the XMG, XMOBTOS, and other government agencies; and organize workshops and seminars.
(iii) Assist the team leader in conducting inception, interim, and final workshops, and in compiling and finalizing the TA inception, interim, draft final, and final reports and other outputs.
(iv) Lead a critical review of the best domestic examples of measurement systems including technical, financial, and political requirements for implementing those best practices and policies.
(v) Lead the preparation of TA output 1 (a GHG emission inventory for Xiangtan).
(vi) Lead the preparation of TA output 2 (a GHG monitoring and accounting system).
(vii) Lead the preparation and implementation of a training program on the GHG monitoring system for technical staff.
(viii) Collaborate with the team leader in assessing the findings of the review of international experiences in green or LCD indices and good practices for feasibility and appropriateness in the PRC context, and help formulate policy recommendations.
(ix) Support the team leader in organizing TA review missions, workshops, and seminars.
(x) Participate in TA review missions, workshops, and seminars, as requested.
(xi) Conduct other related work assigned by the team leader.

5. **Energy management specialist** (4 person-months, intermittent). The specialist should have a postgraduate degree related to energy engineering and over 5 years of work experience

in the field of energy efficiency. The specialist should have demonstrated experience in urban energy-efficiency planning. Familiarity with circular economy principles and their implementation is preferred. Advanced oral and written English skills are preferred. The specialist will undertake the following tasks:

(i) Help the deputy team leader inventory Xiangtan GHG emissions and draft the associated working paper (TA output 1).
(ii) Help the deputy team leader formulate the GHG monitoring and accounting system (TA output 2).
(iii) Support the team leader in organizing TA review missions, workshops, and seminars.
(iv) Participate in TA review missions, workshops, and seminars, as requested.
(v) Conduct other related work assigned by the team leader.

6. **Environmental economist** (4 person-months, intermittent). The specialist should have a postgraduate degree related to environmental economics and over 5 years of work experience in the field. The specialist should have experience performing cost–benefit analysis and economic valuation of policies and regulations, preferably in the field of waste management and recycling. Proficiency in written English is required. The specialist will undertake the following tasks:

(i) Help the team leader formulate the LCD index and associated policy note (TA output 3).
(ii) Help the team leader formulate the LCD Road Map and organize the associated seminar (TA output 4).
(iii) Support the team leader in organizing TA review missions, workshops, and seminars.
(iv) Participate in TA review missions, workshops, and seminars, as requested.
(v) Conduct other related work assigned by the team leader.