



Report and Recommendation of the President to the Board of Directors

Project Number: 52230-001
September 2020

Proposed Loans People's Republic of China: Xiangtan Low-Carbon Transformation Sector Development Program

Distribution of this document is restricted until it has been approved by the Board of Directors. Following such approval, ADB will disclose the document to the public in accordance with ADB's Access to Information Policy.

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 17 August 2020)

Currency unit	–	yuan (CNY)
CNY1.00	=	\$0.1438
\$1.00	=	CNY6.9504

ABBREVIATIONS

ADB	–	Asian Development Bank
BEMS	–	building and utility energy management system
COVID-19	–	coronavirus disease
EBA	–	ecosystem-based adaptation
EDGE	–	Excellence in Design for Greater Efficiencies
EMP	–	environmental management plan
GDP	–	gross domestic product
GHG	–	greenhouse gas
GPP	–	green procurement policy
HPG	–	Hunan Provincial Government
ICT	–	information and communication technology
IEE	–	initial environmental examination
IFC	–	International Finance Corporation
IMF	–	International Monetary Fund
iRAP	–	International Road Assessment Programme
LCCI	–	Low-Carbon Cities Initiative
LIBOR	–	London interbank offered rate
PAM	–	project administration manual
PBL	–	policy-based loan
PMC	–	program management consultant
PMO	–	program management office
PRC	–	People's Republic of China
VCRa	–	volume capture ratio of annual rainfall
XCRCT	–	Xiangtan Climate Resilient City Toolbox
XSDP	–	Xiangtan Low-Carbon Transformation Sector Development Program
XMG	–	Xiangtan Municipal Government

WEIGHTS AND MEASURES

ha	–	hectare
km	–	kilometer
ktCO ₂ e	–	kilotons of carbon dioxide equivalent
m	–	meter
<i>mu</i>	–	Chinese unit of measurement, 1 <i>mu</i> = 666.67 square meters
MtCO ₂ e	–	million metric tons of carbon dioxide equivalent

NOTE

In this report, "\$" refers to United States dollars.

Vice-President	Ahmed M. Saeed, Operations 2
Director General	James P. Lynch, East Asia Department (EARD)
Director	Sujata Gupta, Sustainable Infrastructure Division (EASI), EARD
Team leaders	Nicolas E. Dei Castelli, Senior Transport Specialist, EASI, EARD Na Won Kim, Senior Urban Development Specialist, Urban and Water Division, South Asia Department
Deputy team leader	Heng Xia, Portfolio Management Officer, People's Republic of China Resident Mission (PRCM), EARD
Team members	Yan Yee Chu, Procurement Specialist, Procurement Division 2, Procurement, Portfolio, and Financial Management Department Czareana Dello, Associate Project Analyst, EASI, EARD Daisy D. Garcia, Senior Project Officer, Energy Division, Central and West Asia Department Steven Goldfinch, Disaster Risk Management Specialist, Climate Change and Disaster Risk Management Division, Sustainable Development and Climate Change Department (SDCC) Ki-Joon Kim, Principal Transport Specialist, Transport Sector Group, SDCC Xuedu Lu, Lead Climate Change Specialist, EASI, EARD Ma. Concepcion Jea Macrohon, Project Analyst, EASI, EARD Jeffrey Miller, Principal Transport Specialist, EASI, EARD Heekyung Nam, Counsel, Office of the General Counsel Arun Ramamurthy, Senior Infrastructure Specialist (Digital Technology), EASI, EARD Mark Allister Robis, Senior Financial Management Officer, Office of the Director General, EARD Rosalynn Madeleine C. Serafica, Senior Communications Officer, Media and External Relations Division, Department of Communications Rebecca Stapleton, Transport Specialist, EASI, EARD Johannes Jacobus Frederik Van Rijn, Principal Public Management Specialist, Public Management, Financial Sector, and Regional Cooperation Division, EARD Jian Zhou, Social Development Specialist (Safeguards), EASI, EARD
Peer reviewer	Manoj Sharma, Chief of Urban Sector Group, Urban Sector Group, SDCC

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

CONTENTS

	Page
PROGRAM AT A GLANCE	
MAP	
I. THE PROPOSAL	1
II. THE PROGRAM	1
A. Rationale	1
B. Program Description	4
C. Value Added by ADB	6
D. Development Financing Needs, Investment Cost Estimates, and Financing Plan	7
E. Implementation Arrangements	9
III. DUE DILIGENCE	10
A. Technical	10
B. Economic and Financial Viability	10
C. Sustainability	10
D. Governance	11
E. Poverty, Social, and Gender	11
F. Safeguards	12
G. Summary of Risk Assessment and Risk Management Plan	13
IV. ASSURANCES	14
V. RECOMMENDATION	14
APPENDIXES	
1. Design and Monitoring Framework	15
2. List of Linked Documents	18
3. Development Policy Letter	19
4. Policy Matrix	25

PROGRAM AT A GLANCE

1. Basic Data		Project Number: 52230-001	
Project Name	Xiangtan Low-Carbon Transformation Sector Development Program	Department/Division	EARD/EASI
Country	China, People's Republic of	Executing Agency	Xiangtan Municipal Government
Borrower	People's Republic of China		
Country Economic Indicators	https://www.adb.org/Documents/LinkedDocs/?id=52230-001-CEI		
Portfolio at a Glance	https://www.adb.org/Documents/LinkedDocs/?id=52230-001-PortAtaGlance		
2. Sector		ADB Financing (\$ million)	
✓ Energy	Energy efficiency and conservation		32.19
Information and communication technology	ICT infrastructure		22.20
Public sector management	Public expenditure and fiscal management		50.00
Transport	Urban public transport		50.24
Water and other urban infrastructure and services	Urban flood protection		45.37
Total			200.00
3. Operational Priorities		Climate Change Information	
✓ Accelerating progress in gender equality		GHG reductions (tons per annum)	2,400,000
✓ Tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability		Climate Change impact on the Project	Medium
✓ Making cities more livable			
✓ Strengthening governance and institutional capacity			
		ADB Financing	
		Adaptation (\$ million)	12.04
		Mitigation (\$ million)	83.87
		Cofinancing	
		Adaptation (\$ million)	0.00
		Mitigation (\$ million)	0.00
Sustainable Development Goals		Gender Equity and Mainstreaming	
SDG 1.b		Some gender elements (SGE)	✓
SDG 5.b			
SDG 9.4			
SDG 11.2, 11.b			
SDG 12.8			
SDG 13.a			
SDG 17.4			
4. Risk Categorization:		Complex	
5. Safeguard Categorization		Environment: B Involuntary Resettlement: C Indigenous Peoples: C	
6. Financing			
Modality and Sources		Amount (\$ million)	
ADB		200.00	
Sovereign SDP - Program (Regular Loan): Ordinary capital resources		50.00	
Sovereign SDP - Project (Regular Loan): Ordinary capital resources		150.00	
Cofinancing		0.00	
None		0.00	
Counterpart		195.88	
Government		195.88	
Total		395.88	
Currency of ADB Financing: US Dollar			



XIANGTAN LOW-CARBON TRANSFORMATION SECTOR DEVELOPMENT PROGRAM IN THE PEOPLE'S REPUBLIC OF CHINA

- Project Area
 - Provincial Capital
 - River
 - Prefecture/City Boundary
 - Provincial Boundary
- Boundaries are not necessarily authoritative.



This map was produced by the cartography unit of the Asian Development Bank. The boundaries, colors, denominations, and any other information shown on this map do not imply, on the part of the Asian Development Bank, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries, colors, denominations, or information.

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on (i) a proposed policy-based loan (PBL), and (ii) a proposed project loan, both to the People's Republic of China (PRC) for the Xiangtan Low-Carbon Transformation Sector Development Program (XSDP).

2. The XSDP will enhance the ongoing efforts of the Xiangtan Municipal Government (XMG) to transform Xiangtan from a carbon-intensive, heavily polluting city to a low-carbon, resilient, smart, and livable city, while pursuing continuous growth. The project loan will demonstrate infrastructure transformation through the integration of transport, building, energy, and climate-resilience solutions, complemented by information and knowledge systems. The PBL will reinforce the project through reforms and promote low-carbon behavior changes by creating an enabling environment with appropriate incentives. The XSDP is the first sector development program in the PRC with integrated and multisector solutions.¹

II. THE PROGRAM

A. Rationale

3. **Economic performance of the People's Republic of China and its commitment to climate change.** Since the PRC's economic reforms began in 1978, its gross domestic product (GDP) growth has averaged almost 10% a year, and more than 850 million people have been lifted out of poverty. Income inequality has improved but the PRC lags in labor productivity and human capital.² Its high growth is based on energy- and resource-intensive manufacturing. Rapid growth has exceeded the pace of institutional development, which has led to economic, social, and environmental imbalances. The PRC is the world's largest emitter of greenhouse gases (GHG), so its engagement with climate change issues is necessary. The PRC is a signatory to the Paris Agreement, which was adopted at the 21st Conference of the Parties to the United Nations (UN) Framework Convention on Climate Change. As such, the PRC is committed to its nationally determined contribution, with the ambitious target to peak carbon emissions by 2030. Witnessing rapid urbanization and recognizing the strategic role that cities can play in GHG reduction, the PRC implemented its Low-Carbon Cities Initiative (LCCI). The LCCI encourages cities to create new development models for inclusive, environmentally sustainable, and prosperous cities, and to share their learning.

4. The International Monetary Fund (IMF) assessment indicated that real GDP contracted by 6.8% in the first quarter of 2020 compared to the first quarter of 2019 due to the coronavirus disease (COVID-19) pandemic.³ The IMF predicted that domestic activity will recover from March 2020 onward, projecting real GDP to grow at 1.2% in 2020 and at 9.2% in 2021 (footnote 3), while Asian Development Bank (ADB) predicted the GDP growth at 1.8% in 2020 and 7.4% in 2021.⁴

5. **Xiangtan's commitment to low-carbon development.** Xiangtan is an old industrial city undergoing rapid urbanization and industrial transformation. It is located 40 kilometers (km) south of Hunan's capital, Changsha, and had a population of about 3 million and an urbanization rate of 62% in 2019. Situated within the Changsha–Zhuzhou–Xiangtan (CZT) city cluster, Xiangtan with least population among them has been a key economic driver for Hunan province. Its growth

¹ The design and monitoring framework is in Appendix 1.

² Detailed economic performance of the PRC is provided in the Fiscal and Debt Management Assessment (accessible from the list of supplementary documents in Appendix 2).

³ IMF Assessment Letter (accessible from the list of linked documents in Appendix 2). This letter refers to the PRC assessment letter for the Asian Development Bank, issued on 1 May 2020.

⁴ ADB. 2020. [Asian Development Outlook Supplement \(June2020\)](#). Manila.

has also led to GHG emissions increasing by 4.5% per year during 2005–2016, reaching 39.69 million metric tons of carbon dioxide equivalent (MtCO_{2e}). Xiangtan has a higher GHG intensity per unit of GDP than the average for Hunan province or the PRC. In 2018 Xiangtan became a low-carbon city under the LCCI and is committed to achieving carbon peaking by 2028 to localize the PRC's nationally determined contribution target. The XMG's measures to reduce carbon emissions have included allocation of financial support for industrial transformation, promotion of low-carbon technologies, deployment of clean vehicles, expansion of a public bicycle program, restoration of wetland and forests, and expansion of green areas.⁵ However, much more effort needs to be done to substantially reduce GHG in a very limited time frame without impacting economic growth.

6. Xiangtan's development challenges. In 2016, GHG emissions in Xiangtan were from the following sources: industry (52%), energy processing (18%), building (12%), agriculture (10%), transport (8%), waste (1%), and carbon sink from land-use change and forestry (1%).⁶ As part of its industrial transformation support by policy, the XMG has closed down heavily polluting industrial plants and taken measures to attract high-tech, information and communication technology (ICT), and research and development-oriented industries. Energy and resource-intensive industries remain as the critical economic drivers, but knowledge and technology-based industries are expected to grow. Coal contributes to 96% of the energy source supplied to the grid from Xiangtan.⁷ Solar and wind energy resources are limited in Xiangtan, but other alternative energy sources, particularly industrial waste heat, show great potential to transition to a low-carbon urban energy system. Emissions from the energy used in buildings grew by 330% during 2005–2016, reflecting Xiangtan's rapid urbanization. As the total floor area of urban buildings is expected to grow further, substantial GHG emissions growth is expected if green building interventions are not in place. Emissions from transport increased by 400% from 2005 to 2016 and passenger car ownership increased by 467% during 2008–2018. The urban road network in Xiangtan grew by 43% in 3 years to 500 km, and further expansion is planned. The use of public transport in Xiangtan is low, and without transforming mobility patterns, transport emissions from growing number of private cars will continue to grow rapidly. Xiangtan has worked closely with Changsha and Zhuzhou for better cluster city planning while controlling urban sprawl.⁸ Xiangtan experiences annual flood events that cause significant economic losses and distress.⁹ Recovery, reconstruction, and rehabilitation of infrastructure and systems damaged by floods require substantial resources and energy, resulting in additional GHG emissions. Improved flood resilience of the city will avoid such GHG increases. The XMG initiated sponge city works but needs better knowledge and capacity to integrate more progressive resilience measures into its city development plan.

7. Asian Development Bank engagements and lessons. ADB has provided support on low-carbon city development in the PRC through technical assistance (TA), knowledge-sharing events, and publications. ADB provided TA to Xiangtan during 2015–2017 and initiated GHG inventory development, prepared a city profile covering sector performance and vulnerability to

⁵ Public expenditure on initial low-carbon works was CNY951.6 million (\$135 million) during 2017–2019.

⁶ XMG. 2017. *Xiangtan 2016 Greenhouse Gas Emissions Inventory Report*. (internal).

⁷ The Central China Grid Co. Ltd. run by the State Grid Corporation of China covering Chongqing, Hunan, Hubei, Henan, Jiangxi, and Sichuan provinces is fed by 55% coal, 42% hydro, and 3% wind and solar energy. Xiangtan's energy supply to the grid is mainly coal, while others supply more renewable energy to the grid.

⁸ Xiangtan created "green hearts" with reforestation to control city expansion using the compact city development principle; this increased the carbon sink capacity from zero in 2005 to 465 tCO_{2e} in 2016.

⁹ During 2011–2017, the total direct economic loss was CNY17 billion (\$2.4 billion). These floods affected almost 2.4 million people, including 143,791 who needed relocation.

climate change, and provided in-depth assessment and recommendations.¹⁰ Two follow-up TA projects emphasized the critical roles of local experts and the Hunan Provincial Government (HPG).¹¹ Through extensive dialogues and discussions over two years, ADB carried out effective knowledge transfer and supported the XMG to design and own its unique low-carbon development model. The program incorporates lessons from the ADB-financed TA and loan projects in Xiangtan and the PRC, such as (i) ADB's knowledge transfer should be continued to empower a local government and stakeholders for better planning and development of transformative measures; (ii) integrated solutions that are cost-effective and have multiple benefits should be strengthened to make visible impacts in GHG emission reductions and also make a city livable; (iii) the wider use of smart technologies should be pursued as they can improve the operational efficiency and generate knowledge for continuous improvement; (iv) climate adaptation measures are equally important to avoid or lessen the impacts of flooding and associated losses; (v) infrastructure provision alone would not incentivize the change of low-carbon behaviors and practice and secure the long-term low-carbon transformation.

8. **Choice of modality.** The XMG chose a sector development program modality because the investment project will not be sustainable without having relevant reforms in place. The PBL is necessary to create low-carbon norms, reduce sector incoherency, and institutionalize new ways of doing low-carbon business. As well-designed physical infrastructure can make low-carbon actions easy, and information and knowledge can expand low-carbon know-how, the project loan will demonstrate integrated and multisector solutions to transform infrastructure and install ICT and knowledge platforms. The PBL will reinforce the project and ensure the replication and continuity of low-carbon transformations.

9. The XSDP is fully aligned with ADB's Strategy 2030.¹² It is directly linked to the following operational priorities: (i) accelerating progress in gender equality; (ii) tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability; (iii) making cities more livable; and (iv) strengthening governance and institutional capacity. The XSDP also follows the Strategy 2030 approaches promoting integrated solutions, multisector approaches, digital development and technologies, private sector participation, and innovative features for value addition. By combining all these approaches, the SDP exercises a differentiated approach to the PRC. The XSDP is aligned with ADB's country partnership strategy for the PRC, 2016–2020 and the PRC's Thirteenth Five-Year Plan, 2016–2020 to support more inclusive and environmentally sustainable growth.¹³

10. The COVID-19 had significantly restrained economic activities in Xiangtan and led to the sudden decrease in GHG emissions. With the lowering of COVID-19 related risks, economic activities have been slowly resumed in Xiangtan and carbon emissions are increasing again. By demonstrating transformative integrated and interlinked solutions across physical infrastructure and knowledge-based system provision, the XSDP will create a new green and low-carbon growth model that is resilient to future shocks, while making the city more livable.

¹⁰ ADB. 2015. [*Technical Assistance to the People's Republic of China for Modeling Urban Low-Carbon Development in Xiangtan*](#). Manila.

¹¹ ADB. 2017. [*Technical Assistance for Promoting Low-Carbon Development in Central Asia Regional Economic Cooperation Program Cities*](#). Manila. One of the pilot cities is Xiangtan. The TA provided \$1.7 million for the preparation of the XSDP.

¹² ADB. 2018. [*Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific*](#). Manila.

¹³ ADB. 2016. [*Country Partnership Strategy: Transforming Partnership—People's Republic of China and Asian Development Bank, 2016–2020*](#). Manila; and Government of the PRC. 2015. Government of the PRC. 2015. [*The Thirteenth Five-Year Plan for Economic and Social Development of the People's Republic of China, 2016–2020*](#). Beijing. The XSDP is also fully aligned with the G20 principles of quality infrastructure.

B. Program Description

11. The XSDP is aligned with the following impact: Xiangtan's target of carbon emission peaking by 2028 achieved. The XSDP will have the following outcome: use of low-carbon enabling systems in Xiangtan increased. The XSDP will have four outputs based on Xiangtan's GHG profile, trends, structural challenges, and opportunities for effective carbon reduction. The project loan will support outputs 1, 2, and 3 and the PBL will support output 4.

12. **Output 1: Low-carbon and resilient infrastructure transformation demonstrated.** Through the project, the XMG will transform the transport system from car-centered infrastructure to people-centered mobility systems, enhancing safety,¹⁴ inclusiveness,¹⁵ and resilience. The XMG will transform more than 60 km of urban roads by installing medians and peak-hour curbside bus priority lanes; upgrading bus stops using safe, inclusive design; and providing digital bus information integrated with improved walking and cycling facilities for seamless access across modes. The transformation of streets through layout changes, improved facilities, and ecosystem-based adaptation (EBA) measures installed will demonstrate how streets can function as both flood-mitigating measures and enjoyable urban living spaces.¹⁶ The XMG will modify the access layout at two railway stations using enhanced, user-friendly, and inclusive design to facilitate transitions between public low-carbon mobility modes. The school zone transformation at five primary schools will raise road safety awareness while exceeding the requirements for the highest safety rating for walking and cycling under the International Road Assessment Programme (iRAP) Star Rating for Schools.¹⁷ The XMG will deploy clean energy buses equipped with inclusive and gender-sensitive features, and expand electric vehicle charging infrastructure.

13. The XMG will demonstrate building transformation integrated with advanced technologies and resilience measures. First, the XMG will construct a new hospital with integrated solutions of passive building design; water-saving features; distributed energy systems to generate power, heating, and cooling; and intelligent building energy (and utility) management systems (BEMS). As it is located in a flood-prone zone, the new hospital will be equipped with extensive EBA measures for flood resilience, resulting in enhanced resilience capacity compared to the PRC sponge city technical standards.¹⁸ Second, the XMG will retrofit an unused government building to house the Asia Low-Carbon Training Center, showcasing green and low-carbon building techniques. With support from the HPG and the LCCI, the XMG will run the Asia Low-Carbon Training Center to share its experience on low-carbon transformations and to support the replication of their low-carbon models of Xiangtan in other cities in the PRC and in other developing countries in Asia and the Pacific that share similar challenges.¹⁹ Both buildings (i.e., the hospital and the Asia Low-Carbon Training Center) will obtain Excellence in Design for

¹⁴ Road safety, particularly for pedestrians and cyclists, is a critical factor in promoting low-carbon transportation.

¹⁵ Inclusive design features include tactile paving on sidewalks and at bus stops; designated spaces and seats at bus stops; buses that can accommodate wheelchairs, prams, pregnant women, the elderly, and children; and wide curb ramps and elevated crossings for seamless access for all residents.

¹⁶ EBA with green and blue assets is an effective measure for flood control, drought mitigation, heat stress reduction, and carbon sink, with co-benefits like aesthetic quality, recreational capacity, better air quality, and health benefits.

¹⁷ Safety features include elevated crossings, curb extensions, extensive signs, and road markings for speed and pedestrian crossings. The iRAP provides tools to assess road safety and support safer road infrastructure for casualty reduction. [iRAP](#).

¹⁸ The 2014 sponge city construction technical guide in the PRC describes the volume capture ratio of annual rainfall (VCRa) to quantify a minimum storage volume for drought. The VCRa is set as per the land use and ecological damage sensitivity of a region. As Xiangtan has a VCRa of 75%–85%, the hospital was initially designed to have 740 cubic meters of water detention capacity, but the capacity has since been increased to 6,000 cubic meters.

¹⁹ The program team is preparing a publication titled Xiangtan Climate Actions and Low-Carbon Transformation to support knowledge sharing.

Greater Efficiencies (EDGE) certification developed by the International Finance Corporation (IFC), achieving more than 20% savings each in energy, the energy embedded in the buildings' design and materials, and water compared to the relevant PRC standards.²⁰ Under this output, the XMG will transform 20 aging urban communities into livable low-carbon exemplars.²¹

14. Output 2: Information and knowledge platforms for informed decision-making and behavioral changes enabled. The XMG will develop integrated urban catchment management plans and design for three identified flood-prone zones, which will enhance the XMG's climate resilient city planning knowledge and development.²² Also, the XMG will install, upgrade, and/or reprogram several sector ICT platforms to complement output 1 and provide information necessary for better decision-making and actions. Actions under output 2 will include the following:

- (i) The intelligent transport system will be reprogrammed to switch its main purpose from easing car congestion to enhancing pedestrians' road safety and prioritizing mass transportation over private vehicles.²³
- (ii) A smart bus information platform will be installed for better operations and improved predictability for users.
- (iii) A BEMS connecting 200 public buildings will be installed for operational efficiency and building energy data management.
- (iv) A community-scale multi-energy and utility management system will be installed connecting more than 1,300 companies in an industrial zone to optimize operational efficiency and drive a culture of collaboration among companies within the zone.
- (v) An intelligent early flood warning system will be built for quick data processing and rapid forecasting to achieve early and improved flood response management.
- (vi) A comprehensive environmental monitoring and assessment system (EMAS) will be installed with automated monitoring and intelligent data processing and management to support science-based decision-making.
- (vii) All these will be consolidated into an open and scalable citywide ICT platform that can continuously expand with new functionalities.

15. Output 3: Capacity building and program management enhanced. The XMG will engage a program management consultant (PMC) firm consisting of highly experienced sector, safeguards, and project management consultants to improve the XMG's technical expertise. The PMC firm will (i) support the XMG with the successful implementation of the XSDP, and

²⁰ EDGE certification and its online platform are designed to determine the most cost-effective options for green buildings. EDGE makes it easy to quantify savings, while the PRC's green building labeling system (using points) cannot do so in a straightforward manner. EDGE ensures more than 20% savings in each of the three areas of energy, water, and materials savings compared to the relevant PRC standards. The PRC's 3-star (highest) green building label cannot guarantee 20% savings in all three areas. Compared to the PRC building energy efficiency standards, the new hospital has 26% energy savings and the retrofitted government building will have 23% energy savings. Two EDGE-certified building cases will be shared globally through the EDGE and Green Building Certification Inc. websites. [EDGE](#); and [Green Business Certification Inc.](#)

²¹ Low-carbon and resilient features include building insulation, rooftop solar systems for hot water, light-emitting diode lighting, e-bicycle sharing, EBAs at parking lots, drainage improvement, improved streets for safer walking and cycling, and installation of natural gas for cooking.

²² Three identified flood-prone zones are: (i) Railway station block, (ii) Yaowan Park, and (iii) Yangmeizhou Island.

²³ The reprogramming, which does not require additional components or cost increases, will include the following features: pedestrian crossing lights will always be turned on, and self-optimized traffic lights will give green wave (priority) signals to buses.

(ii) implement a range of capacity building activities so the XMG can sustain its low-carbon transformations and successfully manage the Asia Low-Carbon Training Center in Xiangtan.²⁴

16. **Output 4: Low-carbon transformation policy reforms adopted.** Policy actions under tranche 1 and tranche 2 of the PBL are grouped into the following reform areas: (i) low-carbon, resilient, and smart city development strategy and policies issued; (ii) low-carbon mobility systems enhanced; and (iii) low-carbon energy and building systems enhanced. Tranche 1 has 11 policy actions and tranche 2 has 9 policy actions, which will reinforce outputs 1 and 2 and drive low-carbon innovations and system transformation. Under the first reform area, the Xiangtan low-carbon development plan, 2018–2030 (policy action 1) has set a clear vision and target for the XMG’s low-carbon development. The plan provides clear directions on sector relevance and priority areas, bind the responsibilities of all the XMG bureaus to plan and implement relevant low-carbon works, institutionalize an integrated and holistic approach, and support cross-sector collaboration and cooperation. Policy actions on sponge city-promoting EBA measures will advance city resilience beyond the national sponge city standards (footnote 18). The policy action on smart city development will highlight the integrated approach and cross-sector consolidation for efficient use of public investment. Green procurement policy (GPP) actions, adopted for the first time in the PRC, will lower GHG emissions in the public sector; generate environmental, health, and economic co-benefits; and develop the market for green products and service innovations.²⁵ Under the second and third reform areas, sector policies will create the right incentives, financing models, and other enabling mechanisms to mobilize private sector investments and activate wide participation from all economic actors, including the public. Policy actions under tranche 1 focus on the XMG’s policies, which include sector-specific plans.²⁶ Policy actions under tranche 2 will include management rules for operational reforms, regulations for developing better incentive mechanisms, technical standards to promote low-carbon technologies, and design guides to improve urban infrastructure that supports low-carbon actions and practices of people, and an improved resilience capacity. By August 2020, all the policy actions under tranche 1 have been completed.

C. Value Added by ADB

17. Through early involvement at the concept stage, ADB helped the XMG to define low-carbon development, highlighting ‘system thinking’ with holistic and integrated approaches correcting the siloed development of each sector.²⁷ ADB assisted the XMG in redesigning the project and selecting an effective loan modality considering the XMG’s challenges and ambitious carbon peaking target. ADB supported the XMG (i) in developing appropriate and well-articulated incentive mechanisms to activate all stakeholders for low-carbon decisions and behavior changes; and (ii) in creating effective policies (a) to mobilize domestic financing and private sector investment in low-carbon businesses, and (b) to stimulate the market for low-carbon products and

²⁴ Capacity building activities include trainings on integrated city planning, compact and transit-oriented development planning, bus priority and traffic light system integration and operation, EDGE tools, district energy systems, operation of a range of ICT platforms, GHG inventory and calculation, procurement, financial management, and safeguards.

²⁵ GPPs institutionalize the process of public authorities in procuring goods, services, and works that lower GHG emissions and other negative environmental impacts when compared to goods, services, and works with the same primary functions that would otherwise be procured.

²⁶ These sector-specific plans describe mandates and institutional reforms at the bureau and provide rationale to secure appropriate budget and human resources for the relevant works.

²⁷ Low-carbon development refers to sustainable development grounded in systems thinking and guided by quantifiable indicators of GHG emissions. This type of development encourages integrated city planning, collaborative and coherent sector development, resilience improvement by taking a preventive approach, and active governance through engaging and activating all stakeholders by providing the right incentives.

innovations through TA.²⁸ ADB engaged (i) an iRAP assessor to evaluate the road safety in five school zones and to recommend safety features; (ii) green building and energy experts to redesign two buildings to secure EDGE certification; and (iii) climate adaptation experts to develop the Xiangtan Climate Resilient City Toolbox (XCRCT), a customized touch-table and web-based platform. Using the XCRCT, ADB facilitated collaborative planning among the XMG's bureaus and the consensus-based selection of EBA measures for the project. ADB engaged GPP experts to support the XMG with GPP training and policy drafting, which led to the XMG's commitment to adopt GPP.

18. **Development partner coordination and collaboration.** The XSDP benefits from past and ongoing coordination and collaboration with development partners and other organizations, including German development cooperation through KfW, ICLEI – Local Governments for Sustainability, IFC, the United Nations (UN), and the World Bank.²⁹ IFC provided several rounds of training on EDGE, which led to the XMG's commitment to achieving EDGE certification for new and retrofitted buildings under the project loan. Through coordination with the UN and ICLEI – Local Governments for Sustainability, the XMG and the HPG received GPP training.³⁰ ADB carried out additional due diligence on the XMG's fiscal management sustainability with support from the HPG and the World Bank.

D. Development Financing Needs, Investment Cost Estimates, and Financing Plan

19. The XSDP is estimated to cost \$395.88 million (Table 1), of which ADB will provide \$150.00 million for the project and \$50.00 million for the PBL.

Table 1: Summary Financing Plan

Source	Amount (\$ million)	Share of Total (%)	Share of Project (%)
Asian Development Bank			
Ordinary capital resources (policy-based loan)	50.00	12.63	
Ordinary capital resources (project loan)	150.00	37.89	43.37
Government ^a	195.88	49.48	56.63
Total	395.88	100.00	100.00

^a Government counterpart funding applies only to the project loan.

Source: Asian Development Bank estimates.

20. **Development financing needs and plan.** The government has requested a regular loan of \$50 million from ADB's ordinary capital resources to help finance the reforms. The PBL will be available to the XMG through onlending from the Government of the PRC to the HPG, then to the XMG under the same terms as the original loan. The PBL will have a 15-year term, including a grace period of 3 years, an annual interest rate determined by ADB's London Interbank offered rate (LIBOR)-based lending facility, a commitment charge of 0.15% per year, and such other terms and conditions set forth in the draft loan agreement. The PBL with \$25 million each will be released in two tranches upon full compliance with the tranche release conditions.

²⁸ ADB. 2017. [Technical Assistance to the People's Republic of China for Supporting Project Preparation](#). Manila. This project includes the support for the XSDP.

²⁹ ADB and German development cooperation through KfW explored the possibility of providing cofinancing and carried out several joint missions to Xiangtan. However, the XMG could not accept German development cooperation through KfW cofinancing to ensure debt sustainability issue.

³⁰ GPP is promoted through the UN's 10 Year Framework of Programmes on Sustainable Consumption and Production Patterns, whose working group supported Binhai New District in Tianjin and Guangming District in Shenzhen in the PRC to do pilot procurement on a few selected green products. These districts have not officially adopted GPP.

21. To achieve the successful demonstration of Xiangtan's low-carbon development model, policy reforms are equally important as infrastructure investment. Under the PRC's highly regulated public finance framework, the public finance budget of a local government is funded mostly by local taxes and fees, and its deficit is covered by the central government's tax rebates and transfers. Infrastructure investment under the government fund budget can be funded by land use revenues, bonds, and foreign loans. Expenditure for additional reforms like the XMG's low-carbon development policy reforms becomes a financing gap.³¹ In 2020, the XMG's financing needs are estimated to be CNY10.5 billion, of which 55% is derived from the consolidated fiscal deficit and 45% results from the amortization payments of maturing liabilities. The PBL component reflects the XMG's overall financing needs, the strength of the policy reform package, and net economic benefits of the government reform agenda. For 2020, the government's total gross borrowing requirement is estimated at CNY5.5 billion (\$780.0 million). To meet the financing demand, the government plans to raise about CNY5.1 billion (\$730.0 million) from the issuance of securities, and about CNY352.0 million (\$50.0 million) from official foreign loans. The IMF was consulted on the program and the IMF letter was obtained (footnote 3).

22. **Project investment plan.** The government has requested a regular loan of \$150.00 million from ADB's ordinary capital resources, which will be available to the XMG through onlending from the Government of the PRC to the HPG, then to the XMG under the same terms as the original loan to finance the project. The loan will have a 25-year term, including a 5-year grace period, an annual interest rate determined by ADB's LIBOR-based lending facility, a commitment charge of 0.15% per year, and such other terms and conditions set forth in the draft loan agreement. ADB will finance civil works, goods, and consulting services, including capacity building and program management expenditures. The XMG will finance civil works, goods, and taxes and duties amounting to \$195.88 million. Climate financing is estimated at \$175.91 million, of which ADB will finance \$95.91 million.

Table 2: Project Investment Plan
(\$ million)

Item	Amount ^a
A. Base Cost^b	
1. Low-carbon and resilient infrastructure transformation demonstrated	246.36
2. Information and knowledge platforms for informed decision-making and behavioral changes enabled	55.33
3. Capacity building and program management enhanced	1.50
Subtotal (A)	303.19
B. Contingencies^c	
1. Physical	15.16
2. Price	19.20
Subtotal (B)	34.36
C. Financial Charges During Implementation^d	8.34
Total (A+B+C)	345.88

Note: Numbers may not sum precisely because of rounding.

^a Includes taxes and duties of \$17.58 million. Such amount does not represent an excessive share of the project cost. The Xiangtan Municipal Government will finance taxes and duties of \$8.73 million through cash contribution. The balance of \$8.86 million will be from the Asian Development Bank (ADB) loan.

^b In 2020 prices as of April 2020.

^c Physical contingencies computed at 5.0% of base costs. Price contingencies on foreign currency costs computed at 1.6% from 2021 to 2025. Price contingencies on local currency costs computed at 2.1% from 2021 to 2025.

³¹ The XMG is undergoing a deleveraging process, including expenditure-cutting measures as requested by the HPG, with the intention to scale up land-leasing revenue to pay maturing liabilities. Details on the PRC's public finance framework is provided in Fiscal and Debt Management Assessment (accessible from the list of linked documents in Appendix 2).

^d Includes interest and commitment charges. Interest during construction for the ADB loan was computed at the 5-year fixed swap rate plus a spread of 0.50% and maturity premium of 0.10% per year to be charged on the disbursed and outstanding loan amounts. Commitment charges for the ADB loan were computed at 0.15% per year to be charged on the undisbursed loan amount.

Source: ADB estimates.

E. Implementation Arrangements

23. The XMG is the executing and implementing agency. The XMG established a program management office (PMO), which is led by the secretary-general of the XMG and comprising representatives from relevant bureaus. The HPG, a strong advocate of low-carbon development, is closely involved and has provided guidance, advice, and support to the XMG from the concept stage, which it will continue to provide as it helps oversee the progress during implementation. The implementation arrangements are summarized in Table 3 and described in detail in the project administration manual (PAM).³²

Table 3: Implementation Arrangements

Aspects	Arrangements		
Implementation period	PBL: March 2019–August 2022 Project loan: December 2020–December 2025		
Estimated completion date	PBL: 31 August 2022 Project loan: 20 December 2025		
Estimated loan closing date	PBL: 31 August 2022 Project loan: 20 June 2026		
Management			
(i) Oversight body	Hunan Provincial Government through Hunan Development and Reform Commission and Hunan Department of Finance		
(ii) Executing and implementing agency	XMG		
(iii) Program management office	Secretary-general of the XMG, representatives from the Hunan Development and Reform Commission and other municipal bureaus		
Procurement	OCB (internationally advertised)	5 contracts	\$28.65 million
	OCB (nationally advertised)	14 contracts	\$233.12 million
	Government procurement	6 contracts	\$9.39 million
Consulting services ^a	Quality- and cost-based selection	6 contracts	\$32.04 million
Advance contracting and Retroactive financing ^b	Advance contracting will include five consulting service packages. Retroactive financing will apply for up to 20% of the loan amount for expenditures incurred prior to loan effectiveness, but not earlier than 12 months prior to the signing of the loan agreement.		
Disbursement	The loan proceeds will be disbursed following ADB's <i>Loan Disbursement Handbook</i> (2017, as amended from time to time) and detailed arrangements agreed upon between the government and ADB. The \$50 million PBL will be disbursed in two tranches of \$25 million each upon full compliance with the respective tranche conditions.		

ADB = Asian Development Bank, OCB = open competitive bidding, PBL = policy-based loan, SBD = standard bidding document, XMG = Xiangtan Municipal Government.

^a Consulting services are for project management and capacity building support (footnote 24); detailed engineering designs and construction supervision; and the development of integrated urban catchment management plans and design for three identified flood-prone zones.

^b The terms of reference for the program management consultants are ready for advertisement. One SBD on goods and one SBD on information and communication technology have been prepared.

Source: ADB estimates.

³² Project Administration Manual (accessible from the list of linked documents in Appendix 2).

III. DUE DILIGENCE

A. Technical

24. The XSDP builds on the technical assessment of the infrastructure, systems, and knowledge on climate actions accumulated through several ADB TA projects (footnotes 10 and 11). It incorporates proven and mature low-carbon technology measures that are compatible and suitable for the local conditions, in addition to people-oriented infrastructure design. A flexible district energy system at the EDGE-certified hospital is considered the best technical and most financially viable option to ensure sustainable operations regardless of power outages. The EBA measures that are extensively incorporated in the project streets and in the hospital have sufficient water retention and detention capacity and generate environmental co-benefits. The open and flexible architecture of the Smart City ICT Platform, which can consolidate all sector-based ICT platforms and add new functionality, is a resource-efficient and technically viable solution for smart city development.

B. Economic and Financial Viability

25. **Economic analysis.** To conduct the economic analysis, the economic benefits arising from the project were grouped into four categories: urban transport, flood prevention, energy savings, and the hospital. The PBL is intended to have a range of effects covering all aspects of the project loan and beyond. The project team did not conduct a separate economic analysis for the PBL since its impact is interdependent with that of the project loan and will be captured through the project benefits. The economic analysis shows that all benefit categories are economically viable, with energy savings having the highest economic internal rate of return, followed by flood prevention. The economic internal rate of return for the overall program is 14.6%, and the net present value at a 9.0% discount rate is \$163.1 million. Sensitivity analysis demonstrates that the program will maintain its economic viability under most plausible scenarios.

26. **Financial analysis.** The financial analysis was carried out following ADB guidelines.³³ All project components are nonrevenue generating, and thus the analysis focuses on the financial sustainability of the project. The financial sustainability analysis assessed the financial capacity of the XMG to cover the incremental recurrent costs, including operation and maintenance expenditures required to ensure the sustainability of the project. The fiscal analysis showed that the total project incremental costs will have a negligible impact on the budget of the XMG, confirming the project's sustainability.³⁴

C. Sustainability

27. The sustainability of the XSDP is supported by a solid institutional setup at the XMG as the PMO is led by the secretary-general of XMG who is directly reporting to the Xiangtan Mayor, and has full-time designated staff from all the relevant bureaus as PMO members; close involvement of the HPG as an oversight and supervision authority since the SDP concept stage; and the following measures to improve sustainability of the project. The design of the XSDP incorporates cost-recovery and revenue-generation aspects by enhancing energy and resource-efficient measures and technologies under the project. The XSDP also includes policy actions,

³³ Financial Analysis (accessible from the list of linked documents in Appendix 2).

³⁴ The impact of the incremental costs from 2021 to 2045 is estimated to be 0.14%–1.52% of the XMG's annual fiscal revenue.

creating a range of market-oriented fees and charges that generate revenue, improve the quality of public services, and direct low-carbon behavior.³⁵

28. The XMG remains committed to low-carbon transformation and will support other cities to replicate a low-carbon city model through the establishment of the Asia Low-Carbon Training Center. The fiscal and debt management assessment that was carried out as part of the XSDP's due diligence concluded that the XMG's public finances, including debt service obligations, are sustainable in the medium to long term.³⁶ The debt service-to-revenue ratio is projected to decline from 48% in 2016–2018 to 35% by 2030. The project will have a limited impact on the XMG's fiscal and debt position; the XMG's debt position remains sustainable and debt service obligations continue to be affordable. The analysis (footnote 36) covered projections for 2019–2030 and was predicated upon the XMG's current fiscal and debt policies, the HPG's debt management strategy, and ADB's estimates of economic growth in Xiangtan city. COVID-19 could deteriorate the short-term prospects for economic growth in Xiangtan and the fiscal revenue of the XMG, but it is not expected to affect the medium- to long-term prospects,³⁷ as confirmed by the IMF (footnote 3).

D. Governance

29. The ADB program team carried out the financial management and procurement capacity assessments per ADB requirements. The overall pre-mitigation financial management is assessed as satisfactory, with the XMG capable of funds flow arrangements, staffing, accounting, financial reporting systems, internal and external auditing arrangements, and financial information systems. The overall financial management risk rating of the project without mitigating measures is *moderate*. The program team conducted strategic procurement planning to ensure that fit-for-purpose procurement approaches are developed to achieve value for money and the project's development objectives. The overall procurement risk is *moderate* and relevant mitigation measures are in the risk assessment and risk management plan.³⁸ ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the XMG. The specific policy requirements and supplementary measures are described in the PAM. To enhance procurement capacity, the XMG initiated the engagement process of a qualified and experienced tendering agency for procurement support. Qualified staff from relevant bureaus were designated in the PMO. The PMC firm will provide continuous hands-on project management support and capacity building training to the PMO staff and other relevant government staff.

E. Poverty, Social, and Gender

30. The project will benefit an urban population of about 1.08 million, including 16,171 poor people (of whom 7,223 are female, 1,161 elderly, and 2,273 disabled) through (i) enhanced quality of bus service and customer satisfaction with improved trunk roads, feeder roads, bus stops, and new electric buses; (ii) safer travel and inclusive access for pedestrians and cyclists through improved bikeways and sidewalks; and (iii) reduced economic losses with increased flood-

³⁵ Advanced technologies and measures to improve resource and energy efficiency at the hospital will significantly lower the operational costs. The XMG will introduce the following policy actions: (i) vehicle parking fees in Xiangtan, (ii) demand-driven bus services (e.g., a peak-hour express bus) with increased bus fares, (iii) new neighborhood bus services, and (iv) market-based shared bicycle fees with upgraded bicycle services.

³⁶ Fiscal and Debt Management Assessment (accessible from the list of linked documents in Appendix 2).

³⁷ While the COVID-19 pandemic may impact on the economic activity and taxes collected, its effects are likely to be restricted to late 2019 and 2020, thus implying a downward risk for the short-term outlook underpinning the baseline scenario. No effects are to be expected in the medium to long term. The baseline scenario's projections extending for more than a decade still hold despite the short-term effect of the pandemic.

³⁸ Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

resilient measures. The new hospital will be flood resilient and will provide uninterrupted services during flooding events. Low-carbon and resilient features in 20 aging urban communities will provide a cleaner, greener, safer, and more livable environment to 179,806 residents, including 88,530 female, 49,616 elderly, and 3,672 poor residents. The project will create more than 2,000 job opportunities during construction and more than 700 during operation. Indirectly, the program will promote economic growth and related employment generation.

31. **Gender.** The project is categorized *some gender elements*. Even though surveys done during the program due diligence show no significant difference between males and females on distance, frequency, and mode choice of travel, females are more worried about road safety, particularly children's safety. Older females, or those escorting children or the elderly, expressed their concern on safe and easy access to sidewalks and road crossings. Females are much more conscious about energy, water, and gas savings as well as low-carbon practices, but show a lower level of survey participation. The majority of the female respondents support the project, as it will enhance their quality of life through an improved urban environment and the generation of job opportunities. The XMG developed the social and gender action plan and will implement it to ensure women's participation in public hearings; awareness raising; and public consultations related to the program, targeting at least 40% women's participation.³⁹ The XMG will engage a social and gender development consultant as a part of the PMC firm to support the XMG in implementing and monitoring gender-sensitive actions.

F. Safeguards

32. **Environment (category B).** The XMG prepared an initial environmental examination (IEE), including an environmental management plan (EMP), per ADB's Safeguard Policy Statement (2009). Construction dust, noise, wastewater, and solid wastes; community and worker's health and safety risks; and traffic disruptions will be the primary adverse impacts during construction. Potential negative operation phase impacts include air pollution, noise, wastewater, and waste. As they are short term and localized, good construction practices and measures indicated in the EMP will reduce impacts to acceptable levels. The XMG will establish a project-specific grievance redress mechanism. The XMG has committed to implementing the EMP, grievance redress mechanism, and relevant training, with support from a loan implementation environment consultant. Despite the COVID-19 pandemic, the XMG carried out consultations using a popular social network application and the XMG will conduct in-person public consultations during implementation.⁴⁰ The XMG prepared the environmental impact matrix of the policy actions under the PBL and included in the IEE, confirming no adverse environmental impacts. The program team disclosed the IEE and EMP on the ADB website on 17 April 2020. As the climate risk screening was *medium*, the program team performed a climate risk and vulnerability assessment confirming that the increased rainfall intensity of individual storm events may result in peak flows with flood risks to Xiangtan, particularly in areas with insufficient drainage capacity. The program team conducted a more detailed risk assessment on pluvial flooding and fed into the XCRCT.⁴¹ The XCRCT was used for the project design as it allows users to select

³⁹ The social and gender action plan is included in the PAM. It includes an action that gives priority to qualified female drivers over male drivers for new positions.

⁴⁰ The XMG bureaus and offices reached out through a social network application and obtained more than 1,000 responses from project-affected people, satisfying the Safeguard Policy Statement requirements on meaningful public consultation.

⁴¹ It included analysis of flood hazards, topography analysis, land use assessment, and damage sensitivity; and assessment of the required retention, detention, and/or storage capacity against floods. The Xiangtan pluvial flood hazards map was developed for a rainstorm with a 100-year return period.

specific EBA interventions in specific areas immediately, and to see the estimated resilience capacity improvement and the associated costs.

33. **Involuntary resettlement (category C) and indigenous peoples (category C).** Land required for the construction of the hospital (80.03 *mu*) and the Liwei Substation (8.03 *mu*) was acquired by the XMG for local area development in 2017 and 2013, respectively without anticipating ADB financing. Due diligence confirmed that there is no outstanding or legacy issue on the land allocated for the project. Other components will not induce any physical or economic displacement. The population of scattered ethnic minorities in Xiangtan municipality accounts for 0.49% of the total municipal population. The program will benefit all residents and will not have differential impacts on any specific ethnic minority communities that will trigger ADB's indigenous peoples' policy requirements. For the PBL, the safeguards assessment confirmed that policy actions will not result in involuntary resettlement or impacts on indigenous peoples' communities. On 17 April 2020, the program team disclosed the social safeguard due diligence report on the ADB website, including the safeguards assessment matrix.

34. **Impacts on greenhouse gas emissions.** The program team used the integrated assessment models presented by the Intergovernmental Panel on Climate Change after being scaled down for Xiangtan to develop the worst-case and best-case GHG trajectories for 2020–2045. In the first year after project completion, GHG emissions reduction will be more than 337 kilotons of carbon dioxide equivalent (ktCO₂e). Combining the project and the PBL will lead to a reduction of more than 770 ktCO₂e in 2026. The total amount of GHG reduction over the project lifetime to 2045 will be more than 7 MtCO₂e with an annual average of 378 ktCO₂e. During the program lifetime to 2045, total GHG reduction will be more than 48 MtCO₂e with an annual average of 2.4 MtCO₂e. The project will contribute 5% and the combined project and PBL will contribute 29% to the required cumulative abatement.⁴²

G. Summary of Risk Assessment and Risk Management Plan

35. Significant risks and mitigating measures are summarized in Table 4. All other risks and mitigation measures are described in detail in the risk assessment and risk management plan.⁴³

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigation Measures
The COVID-19 pandemic impacts on the local economy, public fiscal management, and the XMG's priorities	The implementation schedule has been adjusted. The XMG will closely communicate with ADB to discuss priority measures relating to COVID-19 impacts on people's livelihoods and potential impacts on program implementation.
Lack of experience in undertaking procurement, consultant recruitment, and disbursement procedures using ADB guidelines and policies	ADB provided training on the ADB Procurement Policy (2017, as amended from time to time) and procedures from the Loan Disbursement Handbook (2017, as amended from time to time) during project processing and will continue during implementation. The XMG will engage highly qualified personnel with experience in relevant policies and procedures

⁴² Including the methodology and models, the program team prepared the following: Xiangtan Greenhouse Gas Emissions Scenarios and Program Impacts Analysis; Xiangtan Greenhouse Gas Calculation Summary (Excel); Xiangtan Low-Carbon Transport Greenhouse Gas Calculation Model (Excel); Xiangtan District Heating Greenhouse Gas Calculation Model (Excel); and Xiangtan Green Building Greenhouse Gas Calculation Model (Excel) (accessible from the list of linked documents in Appendix 2). The program team shared and discussed the modeling results and GHG calculation with the XMG, helping the XMG reassess the carbon peaking commitment and monitor the low-carbon development progress.

⁴³ Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Risks	Mitigation Measures
	of ADB or other multilateral development banks prior to program effectiveness.
Inadequate technical knowledge to operate clean energy and BEMS at the hospital	XMG will outsource the operation and maintenance of clean energy systems—such as trigeneration (combined cooling, heating, and power) systems, solar PV systems, and BEMS—to an experienced energy service contractor.

ADB = Asian Development Bank, BEMS = building and utility energy management systems, COVID-19 = coronavirus disease, PV = photovoltaic, XMG = Xiangtan Municipal Government.

Source: ADB estimates.

IV. ASSURANCES

36. The government and the XMG have assured ADB that implementation of the program shall conform to all applicable ADB requirements, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, financial management, and disbursement as described in detail in the PAM and loan documents. The government has agreed on certain covenants for the program, which are set forth in the draft loan agreements, program agreement, and project agreement.

V. RECOMMENDATION

37. I am satisfied that the proposed loans would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

- (i) the policy-based loan of \$50,000,000 to the People's Republic of China for the Xiangtan Low-Carbon Transformation Sector Development Program, from ADB's ordinary capital resources, in regular terms, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 15 years, including a grace period of 3 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan agreement presented to the Board; and
- (ii) the project loan of \$150,000,000 to the People's Republic of China for the Xiangtan Low-Carbon Transformation Sector Development Program from ADB's ordinary capital resources, in regular terms, with interest to be determined in accordance with ADB's LIBOR-based lending facility; for a term of 25 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board.

Masatsugu Asakawa
President

21 September 2020

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
3. Capacity building and program management enhanced	<p>2c. BEMS covering 200 government buildings are operational (2019 baseline: NA) (OP 4.1.1, OP 4.1.2)</p> <p>2d. CMEUMS in Xiangtan Jiuhua Industrial Zone is operational (2019 baseline: NA) (OP 4.1.1, OP 4.1.2)</p> <p>2e. Xiangtan-wide EMAS is operational (2019 baseline: NA) (OP 4.1.1, OP 4.1.2)</p> <p>2f. Early flood warning system covering at least 700 km² in urban Xiangtan districts is operational (2019 baseline: NA) (OP 4.1.1, OP 4.1.2)</p> <p>3a. Capacity building and training activities for XMG staff on integrated city planning, compact city and transit-oriented development planning, bus priority with intelligent traffic light management, EDGE-certified green buildings, and district energy system implemented (2019 baseline: NA) (OP 4.3.2, OP 3.1.2)</p> <p>3b. At least 15 female XMG staff trained and report enhanced knowledge on low-carbon and resilient city infrastructure and system development (2019 baseline: 0) (OP 3.1.2)</p> <p>3c. Behavior change communication strategy implemented with at least 50 participants to increase green transport modes and energy efficiency in 20 aging urban communities (2019 baseline: NA)</p> <p>3d. Women comprised at least 40% of the participants who joined the public consultations on road safety, low-carbon mobility, urban climate resilience, and clean energy use (2019: baseline: 0)</p>	<p>2c. Xiangtan Housing and Urban–Rural Construction Bureau annual report</p> <p>2d. Xiangtan Jiuhua Industrial Zone annual report</p> <p>2e. Xiangtan Ecology and Environmental Bureau annual report</p> <p>2f. Xiangtan Water Conservation Bureau</p> <p>3a.–3d. XMG PMO annual report</p> <p>3a.–3d. Post-training surveys of participants</p>	
4. Low-carbon transformation policy reforms adopted	<p>4a. A parking policy and fees are introduced (2019 baseline: NA)</p> <p>4b. School zones have been expanded from 50 to 150 meters (2019 baseline: 50 meters)</p> <p>4c. Tariff-setting rules for clean district heating and/or cooling using waste heat and renewable energy announced (2019 baseline: NA)</p> <p>4d. Sponge city action plan and urban design standards on EBA developed (2019 baseline: NA) (OP 3.2.4)</p>	<p>4a.–4d. Xiangtan Development and Reform Commission annual report</p>	The leadership change in XMG may weaken the accountability and enforcement of the policy actions under the program

Key Activities with Milestones

1. Low-carbon and resilient infrastructure transformation demonstrated

- 1.1 Engage design institutes for detailed engineering design (Q3 2020–Q2 2023)
- 1.2 Prepare the bidding process, tendering of procurement packages, and awarding of contract (Q3 2020–Q3 2024)
- 1.3 Undertake civil works for mobility systems transformation (Q4 2022–Q3 2025)
- 1.4 Procure battery electric buses and electricity chargers (Q1 2022–Q4 2024)
- 1.5 Construct the Xiangtan First Traditional Chinese Medicine Hospital (Q1 2022–Q3 2025)
- 1.6 Retrofit an old government building (Q4 2023–Q3 2025)

2. Information and knowledge platforms for informed decision-making and behavioral changes enabled

- 2.1 Undertake assessment and prepare the ICT platforms bidding process (Q2 2021–Q3 2023)
- 2.2 Install ICT platforms (Q4 2021–Q1 2025)
- 2.3 Develop integrated urban catchment management plans and design for three identified flood-prone zones^e (Q3 2025)

3. Capacity building and program management enhanced
3.1 3.1 Engage program management consultants (Q2 2020–Q1 2021)
3.2 Supervise project implementation (Q1 2021–Q3 2025)
3.3 Plan and execute training programs and capacity building activities (Q3 2021–Q3 2025)
3.4 Draft and finalize project completion report (Q3 2025)
4. Low-carbon transformation policy reforms adopted
4.1 Validate issued policies, guidelines, and regulations related to low-carbon transformation (Q1 2020–Q3 2022)
Inputs
ADB: \$50.00 million (policy-based loan) \$150.00 million (project loan) Government: \$195.88 million
Assumptions for Partner Financing
NA

ADB = Asian Development Bank, BEMS = building and utility energy management system, CMEUMS = community-scale multi-energy and utility management system, COVID-19 = coronavirus disease, EBA = ecosystem-based adaptation, EDGE = Excellence in Design for Greater Efficiencies, EMAS = environmental monitoring and assessment system, GBCI = Green Business Certification Inc., ICT = information and communication technology, IFC = International Finance Corporation, iRAP = International Road Assessment Programme, km = kilometer, km² = square kilometer, ktCO₂e = kilotons of carbon dioxide equivalent, LED = light-emitting diode, m² = square meter, m³ = cubic meter, NA = not applicable, OP=operational priorities, PMO = program management office, PV = photovoltaic, Q = quarter, tCO₂e = tons of carbon dioxide equivalent, XMG = Xiangtan Municipal Government.

^a Government of Xiangtan. 2020. *Xiangtan Low-Carbon City Pilot Implementation Plan, 2017–2030*. Xiangtan.

^b iRAP assesses roads all over the world and aims to significantly reduce road casualties by improving the safety of road infrastructure. [iRap](#).

^c EDGE, an innovation of IFC (a member of the World Bank Group), empowers emerging markets to scale up resource-efficient buildings in a fast, easy, and affordable way. EDGE enables developers and builders to quickly identify the most cost-effective ways to reduce energy use, water use, and embodied energy in materials. [EDGE](#).

^d Other low-carbon features include electric bicycle stations, EBA measures in parking areas, drainage system improvement, street improvements for safe walking and cycling, installation of natural gas distribution pipes for cooking, and community center retrofitting.

^e Three identified flood-prone zones are: (i) Railway station block, (ii) Yaowan Park, and (iii) Yangmeizhou Island.

Contribution to Strategy 2030 Operational Priorities:

OP 3.1. Total annual greenhouse gas emissions reduction (tCO₂e/year). Expected: 700,000 tCO₂e reduced in 2026.

OP 3.1.2 People with increased capacity in implementing mitigation and low-carbon development actions. Expected: 20 female XMG staff and 20 male XMG staff.

OP 3.1.3. Low-carbon infrastructure assets established or improved. Expected: 60 km of urban roads with bus priority lanes incorporated with improved cycling and walkways, one new green hospital construction with clean energy system, and one government building retrofit with energy- and water-saving features.

OP 3.2.4. National and subnational disaster risk reduction and/or management plans supported in implementation. Expected: 2 policy actions relevant to the Xiangtan sponge city development and management plan.

OP 3.2.5. New and existing infrastructure assets made climate- and disaster-resilient. Expected: 1 new hospital building and Fuxing middle road.

OP 4.1. People benefiting from improved services in urban areas. Expected: 179,806 residents in 20 aging urban communities, including 88,530 females and 3,672 low-income residents, benefit from building insulation and other infrastructure upgraded with energy and water savings and resilient features.

OP 4.1.1. Service providers with improved performance. Expected: 6 XMG agencies (Xiangtan Big Data Center for the Smart City ICT platform, Xiangtan Health Commission for hospital BEMS, Xiangtan Housing and Urban–Rural Construction Bureau for the government building BEMS, Xiangtan Jiuhua Industrial Zone management committee for CMEUMS, Xiangtan Water Conservation Bureau for early flood warning system, and Xiangtan Ecology and Environment Bureau for EMAS).

OP 4.1.2. Urban infrastructure assets established or improved. Expected: 60 km of urban roads improved for low-carbon mobility, 1 Smart City ICT platform, 1 BEMS at the new hospital, one Xiangtan-wide EMAS, 1 BEMS to cover 200 government buildings, 1 CMEUMS at Xiangtan Jiuhua Industrial Zone, 1 early flood warning system, 1 power substation constructed to expand the power distribution system at Xiangtan Jiuhua Industrial Zone, and 20 aging urban communities upgraded with building insulation.

OP 4.3.1. Solutions to enhance urban environment implemented. Expected: 1 natural-gas based trigeneration and solar hybrid energy system, 100 battery electric buses, 778 e-charging units. Energy- and water-saving features and appliances at the government building retrofit.

OP 4.3.2. Urban climate and disaster resilience capacity development initiatives implemented. Expected: At least 2 capacity building training events on EBA and climate resilience conducted.

Source: ADB.

LIST OF LINKED DOCUMENTS

<http://www.adb.org/Documents/RRPs/?id=52230-001-3>

1. Loan Agreement: Project Loan
2. Loan Agreement: Policy-Based Loan
3. Project Agreement
4. Program Agreement
5. Sector Assessment (Summary): Urban
6. Project Administration Manual
7. Financial Analysis
8. Economic Analysis
9. Summary Poverty Reduction and Social Strategy
10. Risk Assessment and Risk Management Plan
11. Climate Change Assessment
12. Initial Environmental Examination
13. International Monetary Fund Assessment Letter
14. List of Ineligible Items

Supplementary Documents

15. Financial Management Assessment
16. Fiscal and Debt Management Assessment
17. Strategic Procurement Planning
18. Climate Risk and Vulnerability Assessment, and the Xiangtan Climate-Resilient City Toolbox
19. Social Safeguard Due Diligence Report
20. Poverty and Social Analysis Report
21. Stakeholder Communication Strategy
22. Detailed Project Description
23. Summary of the Xiangtan Low-Carbon Development Plan, 2018–2030
24. Xiangtan Greenhouse Gas Emissions Scenarios and Program Impacts Analysis
25. Explanatory Note on the Transport Emissions Calculation Model
26. Explanatory Note on the Green Building Emissions Calculation Model
27. Explanatory Note on the District Heating Emissions Calculation Model
28. Explanatory Note on the Building and Utility Energy Management System Emissions Calculation Model

DEVELOPMENT POLICY LETTER

中华人民共和国财政部

DEVELOPMENT POLICY LETTER

/8 September ,2020

Dear President Masatsugu Asakawa,

This is my pleasure to write this letter in the context of the proposed policy-based loan from the Asian Development Bank in support of Xiangtan low-carbon transformation Sector Development Program.

I refer to the policy actions of the Xiangtan Municipal Government indicated in the attached copy of the letter from the Hunan Provincial Finance Department dated 8 September, 2020, which include the policy matrix prepared in English and agreed with the program team from the Asian Development Bank. The policy actions described in the policy matrix are essential to advance the efforts of the Xiangtan Municipal Government to transform Xiangtan into a low-carbon, sustainable, and livable city.

I am pleased to convey the full support of the Government of the People's Republic of China to the Hunan Provincial Government and the Xiangtan Municipal Government in implementing the program and the policy actions set out in the attached letter and request the Asian Development Bank to provide us a loan with \$50 million from ADB's Ordinary capital resources, which the central government will on-lend to the the XMG through Hunan Provincial Government for such purpose.

Sincerely,



Han Bin
Deputy Director General
Department of International Economic and Financial Cooperation
Ministry of Finance
Government of the People's Republic of China

湖南省财政厅

Letter on Supporting the Application of ADB Development Policy Loans for Xiangtan Low-Carbon Transformation Sector Development Program

September 8, 2020

Dear President Masatsugu Asakawa,

With the joint efforts of all levels and parties from China and our counterparts from abroad, the preparation for the ADB-financed Xiangtan low-Carbon transformation Sector Development Program is progressing smoothly, and online and offline negotiations have been carried out in Beijing, Changsha, and Manila in the Philippines from August 20 to 21. According to the consensus reached in the negotiations, the pilot construction of a low-carbon city in Xiangtan will be supported in the form of investment project loans and development policy loans. To this end, Mr. Yang Guang, the vice mayor of Xiangtan Municipal People's Government, specially signed the "Xiangtan Low-Carbon Transformation Sector Development Program Development Policy Letter".

As the authorised agency of Hunan Provincial Government to apply for foreign loans, our department would like to express our full support for the ADB loan for the Xiangtan low-Carbon transformation Sector Development Program. I look forward to seeing the achievements that Xiangtan could make through your bank's development policy loans by building a low-carbon smart development policy standard system for urban infrastructure, a low-carbon transportation system, and a low-carbon energy and building system. I also look forward to seeing the accumulated experience in low-carbon city construction and the use of ADB's development policy loan tools in Hunan province.

Sincerely,



Lin Deyong

Deputy Director-General

Hunan Provincial Finance Department

Mr. Masatsugu Asakawa
President
Asian Development Bank

Date: 23 August 2020

Proposed Xiangtan Low-Carbon Transformation Sector Development Program

Dear President Asakawa:

The Xiangtan Municipal Government of the People's Republic of China (PRC) is committed to and has initiated comprehensive efforts to transform Xiangtan from a carbon-intensive to a low-carbon, climate resilient, and liveable community under the Xiangtan's Low-Carbon Development Plan (2018–2030). Attached is the policy matrix prepared in English and agreed with the Asian Development Bank.

Our policy reform actions are aimed to transform Xiangtan into a low-carbon, resilient, and smart city. Reform areas were formulated into three areas, which are (i) Low-Carbon, Resilient, and Smart City Development Strategy and Policy Issued; (ii) Low-Carbon Mobility Systems Enhanced; and (iii) Low-Carbon Energy and Building Systems Enhanced.

Reform area 1 on 'Low-Carbon, Resilient, and Smart City Development Strategy and Policy' has seven policy actions, aiming to establish a strong foundation with strategic vision and priority actions to build a Low-Carbon, Resilient, and Smart Xiangtan. These actions include: a strategy policy framework of low-carbon development plan 2018-2030 that sets Xiangtan's ambitious greenhouse gas emissions peaking by 2028, assigns all the bureaus with responsibilities and proactive involvement in their sector areas of reform for low-carbon development, encourages

collaborative city planning and development among sector bureaus and relevant stakeholders, and sets up mechanisms to monitor and report the progress of Xiangtan's low-carbon actions in Xiangtan.

Through the Xiangtan Sponge City Specific Plan 2019-2035, Xiangtan will advance sponge city development by promoting ecosystem-based adaptation measures with green assets and ecosystem services as effective measures for flood control, drought mitigation, heat stress reduction, and carbon sink. These measures also provide co-benefits like aesthetic quality, recreational and restorative capacity, improved local air quality, and health benefits and will improve institutional management for a resilient Xiangtan. Aligning with Smart Xiangtan Development, the Smart Xiangtan Construction Master Plan will strengthen consolidated efforts to develop various ICT platforms; institutionalize the Xiangtan Big Data Center to ensure integration in management, operation, data standards, data sharing, and R&D; further improve relevant institutional arrangement by properly setting the user-fees and regulating data sharing, and strengthen data security.

For the first time at a city level in the People's Republic of China, green and low-carbon procurement policy (also known as green public procurement (GPP)) will be introduced in Xiangtan. The GPP, promoted by the United Nations' 10 Year Framework Programme on Sustainable Consumption and Production, will institutionalize the process of public procurement for goods, services and works that have lower GHG emissions and other environmental negative impacts compared to goods, services and works with the same primary function that would otherwise be procured. While reducing GHG emissions in the public sector, GPP will bring other environmental, social, health, and economic benefits, and influence the market for low-carbon product innovation.

Under reform area 2 on enhancement of low-carbon mobility system, a total of 7 policy actions will enable transformation of the Xiangtan's vehicle-centered transport system to a people-oriented low-carbon mobility system so that all Xiangtan citizens can enjoy using more active transportation modes with safe and comfortable street environment. Developing high quality design standards will ensure mobility infrastructure to be high quality, better integrated, safe, inclusive, green, low-carbon, and resilient one. Introducing parking policy and management rules will minimize private vehicle use and encourage the use of low-carbon mobility system. Recognizing the importance of road safety for low-carbon mobility system development, policy actions include reforms on school zones to enhance the road safety of children, who are the future owners of Xiangtan. Policy actions include the promotion of clean vehicles and relevant infrastructure development to lower transport related GHG emissions.

Reform area 3 on low-carbon energy and building systems enhancement, a total of 6 policy actions demonstrate the XMG's strong commitment to mainstream clean energy business and green buildings in Xiangtan. Policy actions create enabling systems for this transformation, particularly developing appropriate, fair, and strong incentives mechanisms for both suppliers and consumers. These include the promotion of energy performance contracting and energy service companies; collaboration with local banks to promote green financing for clean energy and green building developers and users; promote smart energy and building energy management systems, while expanding energy and building energy audits and statistics; and provide strong support to Xiangtan industrial development zones for their system enhancement on energy and utility management and operation.

These policy and reform measures would ensure continuity and sustainability of the low-carbon transformation of Xiangtan. The Xiangtan Municipal Government, supported by the Hunan Provincial Government and the central government, has already invested CNY952 million for

the initial works pursuing low-carbon city development during 2017–2019, more financial inputs are required to expand its scope and coverage.

Through low-carbon transformation supported by all stakeholders, we could ensure to achieve our carbon peaking commitment by 2028, while contributing to the People's Republic of China's national commitment of carbon peaking by 2030. In addition, we hope to share our experience of developing unique low-carbon development models, the knowledge accumulated through this experience, to other cities in the People's Republic of China and also other countries in Asia and the Pacific.

I would like to express appreciation to the Asian Development Bank, our long-term partner, in designing the policy reform actions as set out in the attachment and request ADB to provide us with a loan of \$50 million from ADB's Ordinary Capital Resources which the central government will relend to the Xiangtan Municipal Government for such purpose. I sincerely believe the cooperation between ADB and the Xiangtan Municipal could bring great success to our journey to low-carbon development in Xiangtan.

Sincerely,

Executive Vice Mayor
Xiangtan Municipal Government



POLICY MATRIX

	Tranche 1 (prior actions before August 2020) (all policy actions completed by August 2020)		Tranche 2 (by 24 months from Tranche 1)
Reform area: Low-Carbon, Resilient, and Smart City Development Strategy and Policy Issued			
1	<p>XMG shall have issued the Xiangtan low-carbon development plan 2018–2030 to set the carbon peaking target by 2028 and provide a framework for low-carbon development that includes priorities and requirements by sector, governance and institutional coordination mechanisms, and resource allocation.</p> <p>(Document required: XMG to provide the copy of officially issued Xiangtan low-carbon development plan 2018–2030) (completed in March 2020)</p>		
2	<p>XMG shall have issued the Xiangtan sponge city specific plan 2019–2035 to improve climate resilient infrastructure development by including mechanisms for cross-sectoral coordination, training, and clear adoption deadlines for updated design standards that incorporate eco-system based adaptation (EBA) measures.</p> <p>(Document required: XMG to provide the copy of the issued Xiangtan sponge city specific plan 2019-2035) (completed in July 2020)</p>	12	<p>XMG shall have issued Xiangtan design standards on EBA measures that provide technical specifications on EBA measures for infrastructure development to improve quality and resilience in infrastructure development.</p> <p>(Document required: XMG to provide the copy of the issued Xiangtan design standards on ecosystem-based adaptation measures)</p>
3	<p>XMG shall have endorsed the smart Xiangtan construction master plan submitted by Xiangtan Big Data Center to strengthen consolidated efforts to develop various ICT platforms, institutionalize Xiangtan Big Data Center to ensure integration in management, operation, data standards, data sharing, data security, and research and development.</p> <p>(Document required: XMG to provide the copy of the official approval of smart Xiangtan construction master plan) (completed in March 2020)</p>	13	<p>XMG shall have issued Xiangtan management rules on integration of ICT platforms to provide details on management rules on the use of centralized server, improve institutional arrangement, provide user-fee calculation methods, regulate data sharing, and strengthen data security.</p> <p>(Document required: XMG to provide the copy of the issued Xiangtan management rules on integration of ICT platforms)</p>
4	<p>XMG shall have issued the Xiangtan framework low-carbon procurement policy to set the goals, principles, institutional arrangements and coordination mechanisms for prioritization and integration of low-carbon procurement in goods and services in government procurement.</p> <p>(Document required: XMG to provide the copy of the issued Xiangtan framework low-carbon procurement policy)</p>	14	<p>XMG shall have issued Xiangtan low-carbon procurement implementing rules, including design of e-procurement system and implementation of required capacity buildings activities.</p> <p>(Document required: XMG to provide the copy of the issued Xiangtan low-carbon procurement implementing rules)</p>

	Tranche 1 (prior actions before August 2020) (all policy actions completed by August 2020) (completed in July 2020)		Tranche 2 (by 24 months from Tranche 1)
Reform area: Low-Carbon Mobility Systems Enhanced			
5	XMG shall have issued an addendum to the Xiangtan city public transport plan 2014–2030 to implement the bus priority system, create public transport promotion fund, provide capacity building activities to enhance integrated land use and transport planning, and carry out feasibility and appropriateness of implementing demand-driven bus routes. (Document required: XMG to provide the copy of the officially issued addendum to the Xiangtan city public transport specific plan 2014–2030) (completed in April 2020)	15	XMG shall have issued Xiangtan management rules on city-express and neighborhood buses to expand public bus services and introduce demand-driven bus routes and fare operation. (Document required: XMG to provide Xiangtan management rules on city-express and neighborhood buses)
6	XMG shall have issued an addendum to the Xiangtan cycling and pedestrian development specific plan to enhance safer and more comfortable access for pedestrians, better integration between non-motorized transport facilities and public bus facilities, and improve public awareness on active transportation like walking and cycling. (Document required: XMG to provide the copy of the officially issued addendum to the Xiangtan cycling and pedestrian development specific Plan) (completed in March 2020)	16	XMG shall have issued Xiangtan low-carbon sustainable urban road design guidelines that provide design specifications for people-oriented transport infrastructure, including dedicated walk and cycleways, dedicated bus lanes, public transport prioritization, hubs, 150 meter school zones, and enhanced road safety features. (Document required: XMG to provide the copy of the officially issued Xiangtan low-carbon sustainable urban road design guidelines)
7	XMG shall have issued an addendum to Xiangtan regulations on strengthening the management of electric motorbikes to control e-motorbike's speed and regulate the use of e-motorbikes in the area with high volume pedestrians and cyclists and school zones. (Document required: XMG to provide the copy of the officially issued addendum to Xiangtan regulations on strengthening the management of electric motorbikes) (completed in August 2019)	17	XMG shall have issued Xiangtan management rules on electric motorbikes free zones to designate zones to prevent any access to e-motorbikes, develop penalty mechanism, and improve parking facilities nearby the motorbike free zones so to enhance safety of pedestrians and cyclists. (Document required: XMG to provide the copy of the officially issued Xiangtan management rules on electric motorbikes free zones)
8	XMG shall have issued Xiangtan rules on vehicle parking management to introduce vehicle parking management and parking fee. (Document required: XMG to provide the copy of the officially issued Xiangtan rules on vehicle parking management) (completed in August 2020)		

	Tranche 1 (prior actions before August 2020) (all policy actions completed by August 2020)		Tranche 2 (by 24 months from Tranche 1)
Reform area: Low-Carbon Energy and Building Systems Enhanced			
9	<p>XMG shall have issued the Xiangtan 13th five-year plan comprehensive work program for energy conservation and emission reduction, identifying objectives and priority projects which promote clean and renewable energy technologies, EPC and ESCOs, and green buildings.</p> <p>(Document required: XMG to provide the copy of the issued Xiangtan 13th five-year-plan comprehensive work program for energy conservation and emission reduction) (completed in March 2019)</p>	18	<p>XMG shall have issued Xiangtan management rules on industrial zone autonomy regarding the use of energy and resource to support each industrial zone to create their own management schemes and rules, including mandatory connection to smart energy/utility management system, if available at a zone level.</p> <p>(Document required: XMG to provide the copy of the issued Xiangtan management rules on industrial zone autonomy regarding the use of energy and resource)</p>
10	<p>XMG shall have issued Xiangtan implementing rules on the use of concession contracts for developing district energy to provide clear roles and responsibilities of contractors to encourage private investment in energy development and market-based district energy tariff setting.</p> <p>(Document required: XMG to provide the copy of the issued Xiangtan implementing rules on the use of concession contracts for developing district energy) (completed in March 2019)</p>	19	<p>XMG shall have issued Xiangtan management rules on urban centralized energy supply systems (i.e. heating and cooling) that outline key technical specifications and requirements for low-carbon technologies (including waste heat), connection requirements, and consumption-based tariff setting.</p> <p>(Document required: XMG to provide the copy of Xiangtan management rules on urban centralized energy supply systems)</p>
11	<p>XMG shall have issued an addendum to Xiangtan implementing regulations regarding green buildings to promote the use of EPC for public institution buildings' energy efficiency, support local banks to develop green financing products for building energy efficiency, green buildings, and pilot building energy management for public buildings.</p> <p>(Document required: XMG to provide the copy of the issued addendum to Xiangtan implementing regulations regarding green buildings) (completed in March 2020)</p>	20	<p>XMG shall have issued Xiangtan green building management rules to promote quantifiable green buildings certification, EPC and ESCO for building energy efficiency, building energy audit and statistics system.</p> <p>(Document required: XMG to provide the copy of the issued Xiangtan green building management rules)</p>

EBA = ecosystem-based adaptation, EPC = energy performance contracts, ESCO = energy service companies, ICT = information and communication technologies, XMG = Xiangtan Municipal Government.