









Urban-Act China Component: A Closing Look Back

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IKI INTERNATIONAL CLIMATE INITIATIVE

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Urban-Act
Integrated Urban Climate Action for Low-Carbon & Resilient Cities

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Project description

Integrated Urban Climate Action for Low-Carbon and Resilient Cities (Urban-Act)

The Urban-Act project is implemented on behalf of the International Climate Initiative (IKI) of the Federal Government of Germany. Within the Federal Government, the IKI is anchored in the Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN).

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Beijing, September 2026

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List of Abbreviations

A-S-I	Avoid-Shift-Improve
BAPPENAS	Ministry of National Development Planning (Indonesia)
BMUKN	Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (Germany)
BRT	Bus Rapid Transit
CACP	Certification in Audit Committee Practices
CHN	China
Climate ADAPT	European Climate Adaptation Platform
CSPON	China Spatial Planning Observation Network
DENR	Department of Environment and Natural Resources (The Philippines)
DILG	Department of the Interior and Local Government (The Philippines)
DPT	Department of Public Works and Town & Country Planning (Thailand)
ESCAP	Economic and Social Commission for Asia and the Pacific
ESP	Ecological Spatial Planning
ESPON	European Spatial Planning Observation Network
EU	European Union
EUR	Euro
FGD	Focus Group Discussion
GHG	Greenhouse Gas
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (Germany)
GPC	Global Protocol for Community-Scale Greenhouse Gas Inventories
IDN	Indonesia
IKI	International Climate Initiative
IND	India
IPCC	Intergovernmental Panel on Climate Change

LLM	Large Language Model
MEE	Ministry of Ecology and Environment (China)
MNR	Ministry of Natural Resources (China)
MNRE	Ministry of Natural Resources and Environment (India)
MoHUA	Ministry of Housing and Urban Affairs (India)
MoHURD	Ministry of Housing and Urban-Rural Development (China)
MoI	Ministry of Interior (Thailand)
MRV	Monitoring, Reporting, and Verification
NCC-CMA	National Climate Centre of China Meteorological Administration (China)
NCSC	National Centre for Climate Change Strategy and International Cooperation (China)
NDCs	Nationally Determined Contributions
NDRC	National Development and Reform Commission (China)
ONEP	Office of Natural Resources and Environmental Policy and Planning (Thailand)
PHL	The Philippines
RESIN	Climate Resilient Cities and Infrastructures
SDGs	Sustainable Development Goals
STUPDI	Shanghai Tongji Urban Planning & Design Institute
SUMI	Sustainable Urban Mobility Indicators
SUMP	Sustainable Urban Mobility Plan
SUPDRI	Shanghai Urban Planning and Design Research Institute (China)
SZBG	Shenzhen Bus Group (China)
TEN-T	Trans-European Transport Network
THA	Thailand
TJU	Tongji University (China)
TSP	Territorial Spatial Planning
UAST	Urban Adaptation Support Tool
UCLG ASPAC	United Cities and Local Governments Asia-Pacific

1 Project References

1.1 Urbanisation and Climate Challenges in Asia-Pacific Region

Climate change is accelerating globally, while current policy and financing commitments remain insufficient to achieve the 1.5°C target. As the world's most populous and rapidly urbanising region, Asia-Pacific sits at the centre of global climate and sustainable development efforts. Home to 54% of the global urban population [1], the region accounts for nearly half of global energy consumption and more than half of energy-related greenhouse gas emissions, with cities serving as the primary drivers of both economic growth and carbon emissions. [2] [3]

At the same time, Asia-Pacific is one of the world's richest biodiversity hotspots, hosting several of the most biodiverse countries globally (Indonesia (2nd), China (3rd), India (8th), Thailand (18th) and the Philippines (22nd) [4]). However, biodiversity conservation and ecosystem restoration continue to face significant financing gaps, placing critical natural assets under growing pressure.

49 of the world's 50 most polluted cities are located in Asia [5], East Asia and the Pacific generates 23% of global waste [6], nearly half of the urban population in this region resides in low-lying coastal areas. These challenges are further intensified by rapid urbanisation. The region's urban population is projected to reach 3.38 billion by 2050, demand for resources and infrastructure will grow rapidly, exacerbating air pollution, waste generation, and environmental degradation, and making cities increasingly vulnerable to climate-related risks, including extreme weather events, flooding, and sea-level rise.

These compounding risks highlight the necessity of integrating climate action, biodiversity conservation and sustainable urban development rather than addressing these agendas separately. This further highlights the urgent need for initiatives such as regional cooperation projects—rather than those only involving a single country—to promote long-term, sustainable urban development in the region.

1.2 The Status-quo of China's Urban Development and Climate Actions

As the biggest greenhouse gas emitter worldwide, China has made decisive actions to fulfill the commitment to emission reduction in the last decades. In 2020, China firmly committed to peaking carbon dioxide emissions before 2030 and achieving carbon neutrality before 2060, furthermore with the newest China's 2035 National Determined Contributions (November 2025), China announced the ambitioned targets to reduce economy-wide net GHG emissions by 7-10% from peak levels by 2035 and increase the share of non-fossil energy to over 30% of total consumption [7].

Over the past two decades, China has advanced climate-oriented urban development through low-carbon city pilots, territorial spatial planning and climate adaptation initiatives. The National Development and Reform Commission (NDRC)'s Low-Carbon Provinces and Cities Pilot Program and Ministry of Ecology and Environment (MEE)'s climate-resilient city pilots have generated practical experience, with 30 of 31 provinces, autonomous regions, and municipalities having issued climate adaptation action plans aligned with the National Climate Change Adaptation Strategy 2035 [8].

Taking some cities from China as an example:

Guided by "Xi'an's 15th Five-Year Plan for National Economic and Social Development" [9], the city has integrated green and low-carbon transition throughout the entire development process, with the carbon peak target set to be achieved as scheduled. The Plan calls for efforts to advance green and low-carbon transition in key sectors, including industry, energy, construction, transport, and agriculture, and to gradually shift from dual control of energy consumption to dual control of carbon emissions. Building on this foundation, as one of the first batch of national pilot cities for coordinated innovation in pollution reduction and carbon abatement, Xi'an issued the "Implementation Plan for Xi'an Pilot Project on the Coordinated Innovation of Pollution Reduction and Carbon Abatement" [10]. The Plan established a pioneering "4+3+3+6" coordinated pollution carbon reduction framework, which functions as the operational carrier for district detailed planning. Its four implementation sectors perfectly match the four governance dimensions (energy, industry, transport, and environmental governance) stipulated in district detailed plans. The two policy frameworks jointly set up a supervision and assessment mechanism for district carbon peaking targets, and the implementation outcomes of low-carbon resilient district level.

Supported by the "Jiaxing City Low-Carbon Urban Planning Research Report" [11], Jiaxing has carried out multiple spatial governance upgrades for climate adapted low carbon development. Its "Territorial Spatial Master Plan of Jiaxing (2021–2035)" [12], which has been approved by the People's Government of Zhejiang Province, provides the statutory basis for the city's spatial development. The research report proposes to systematically integrate climate change considerations into territorial spatial planning, and recommends strengthening planning controls in areas such as carbon sink space protection, urban wind corridor development, and storm water resilience enhancement. The report also suggests incorporating climate risk assessment into the approval process for relevant plans.

Xiamen is systematically developing transport related climate resilience works suited to its bay city features [13]. The "Special Plan for the Non-motorised Transportation System of Xiamen(2025-2033)" [14], adopts a dual-network model comprising a leisure non-motorised transportation network and a commuter non-motorised transportation network. The Plan integrates a four-level green transport framework including rail transit, BRT, regular buses and city-wide non-motorised transportation networks. It designs leisure and commuter non-motorised transportation corridors with a planned total slow-traffic mileage of nearly 2,079 km. District regulatory detailed planning is required to add more dedicated pedestrian and cycling lanes and enhancing the spatial safety and resilience.

While China has built an initial interdepartmental coordination framework for rapid urbanization and climate governance over the past decades, established a vertically integrated central-to-local policy delivery system, and rolled out hundreds of sponge city and low-carbon and resilient pilots projects in different cities and areas. Yet multiple challenges still persist, inter-departmental goal misalignment and blurred responsibility boundaries remain unresolved; differentiated central-local incentive mechanisms are still being refined; some grassroots implementation prioritizes form over substance; and cross-sector collaborative governance has yet to reach its full potential. Deep integration of urbanization and climate action therefore requires further systematical optimization.

Persistent Challenges

- Vertical and cross-sectoral coordination: Integrating climate objectives into local spatial planning remains challenging, particularly across land use, transport, infrastructure and ecological conservation.
- Local implementation capacity: Many cities still face capacity constraints in climate risk assessment, project preparation and evidence-based planning.

2 Urban-Act Project Overview

2.1 Project General Information & Structure

The project "Integrated Urban Climate Action for Low-Carbon & Resilient Cities (Urban-Act)" was commissioned under the International Climate Initiative (IKI) of the German Federal Government in October 2022. The project supported the transition towards low-carbon and climate-resilient urban development in five partner countries: China, India, Indonesia, Thailand and the Philippines. Among specific local implementation partners in each country, we also have four regional consortium partners UNESCAP, UCLG ASPAC University of Stuttgart, and Technical University of Dortmund, who supported country components for regional coordination and collaboration as well as academic research exchange.



Project Information

Commissioner

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN)

Funding

IKI / BMUKN: ca. EUR 22.625 Mio
+ EU Co-finance (PHL Circular Economy): EUR 12 Mio

Timeframe

5+ years
04/2022 – 12/2027

Political Partners

- MNR and MEE (CHN)
- BAPPENAS (IDN)
- MOHUA (IND)
- DILG and DENR (PHL)
- MOI (THA)

Consortium Partners

GIZ, ESCAP, UCLG ASPAC
University of Stuttgart, Technical University of Dortmund
15 National Implementing Partners in five countries

2.2 Project Goal & Approach

In line with the Paris Agreement and the 2030 Agenda, Urban-Act project aims to strengthen the institutional capacities of national and subnational governments and to support cities better implement evidence-based, inclusive climate actions.

At the national level, it supports improving enabling conditions of integrated mitigation and adaptation approaches at country and regional level through policy dialogue and technical advice, through cross-sectoral and multi-level coordination vertically and horizontally.

At the subnational level, it supports the transformation of urban development towards a sustainable, low-carbon and climate-resilient future through technical assistance, pilot implementation and the identification of innovative projects and facilitation of access to project preparation and finance.

At the meantime, the project promotes and enables knowledge exchange through regional activities and city-paring format across the Asia-Pacific.



3 China's Implementation & Impact

3.1 China Component Structure

Political Partners

- Ministry of Natural Resources of the People's Republic of China
- Ministry of Ecology and Environment of the People's Republic of China

Implementing Partners

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

同济大学 TONGJI UNIVERSITY

NCSC

上海市城市规划设计研究院 Shanghai Urban Planning & Design Research Institute

西安市城市规划设计研究院

Implementing Partners (Own-Contribution)

- National Territorial and Spatial Planning and Research Centre
- China Land Surveying and Planning Institute

Pilot Cities

Jiaxing City



Xiamen City



Xi'an City



Pilot Cities and Regions (Own-Contribution)

Shanghai City



Demonstration Zone of Green and Integrated Ecological Development of the Yangtze River Delta



Xiong'an New Area



In China, this project collaborated with the Ministry of Natural Resources (MNR) and the Ministry of Ecology and Environment (MEE). It maintains close working ties with multiple implementing partners including Tongji University (TJU), the Shanghai Urban Planning and Design Research Institute (SUPDRI), the National Centre for Climate Change Strategy and International Cooperation (NCSC) and the Xi'an City Planning & Design Research Institute. Research and pilot implementation for city-scale low-carbon and resilient planning have been carried out in Jiaxing, Xiamen, Xi'an.

The project has also established formal collaborative partnerships with the China Land Surveying and Planning Institute and the National Research Center for Territorial and Spatial Planning. At the same time, building on the endorsement from our political partner, the project has further expanded its piloting experiments to other cities and regions, such as the Xiong'an New Area, Shanghai, and the Yangtze River Delta Green Integrated Ecological Development Demonstration Zone.

Beyond that, the project identified demand-led partnerships to support peer Urban-Act countries. Together with the National Climate Centre of the China Meteorological Administration (NCC-CMA), Shenzhen Bus Group (SZBG) and the Shanghai Tongji Urban Planning & Design Institute (STUPDI), the team provided tailored technical co-operation on topics such as climate services, the electrification of public transport, ecological spatial planning, the sponge-city concept, etc. These exchanges fostered mutual trust and strengthened institutional and technical capacities, enabling partner countries to adapt and apply tested approaches in their own contexts.

3.2 China's Scope of Work

Improved Institutional Environment for Climate-Sensitive Urban Development:



- Drawing on the experience of policy agenda development on climate-sensitive spatial planning in China and the EU
- Support for inter-ministerial cooperation in China
- Promotion of vertical integration in policy governance

Project Concepts for Urban Climate Action Investment Identified:



- Trainings to support the practitioners and to enhance their abilities to carry out climate projects at the city level
- Establishment of the project-level climate assessment tools

Evidence-Based and Inclusive Climate-Sensitive Spatial and Urban Planning:



- Integration of climate-sensitive factors and indicators into urban spatial planning
- Strengthening of multi-level, intersectoral coordination and communication at the national and subnational levels

Enhanced Knowledge through Regional Networking, Exchange, and Learning:



- Dissemination of China's experiences and successful cases on climate-sensitive urban spatial planning within the project regional network
- Promoting regional cooperation together with regional peer learning and exchange among partners



3.3 Key Achievements of Implementation

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Technical Reports and Case Studies

focused on low-carbon and resilient spatial planning, carbon accounting and control, and low-carbon urban transport planning, amongst others supported the release of the "Technical Guideline for Climate Change Impact and Risk Assessment (Trial) "(MEE) and contributed to the drafting the "Guideline for Territorial and Spatial Detailed Planning" (MNR)

10

Technical Workshops

focused on low-carbon and resilient urban planning, low-carbon transport, and green and resilient urban development, engaged over 100 stakeholders from Urban-Act partner countries

7

Regional Conferences

shared low-carbon and resilient territorial spatial planning and climate action best practices, attracted over 300 participants from all over the world

6

Delegation Exchanges

focused on sustainable urban development low-carbon transport and ecological spatial planning, with engagement of over 100 stakeholders from Germany, Thailand and Indonesia

2

Regional Trainings

shared good practices on low-carbon urban planning with over 100 participates from Urban-Act partner countries as well as trained 4 representatives from Thailand and Indonesia on early warning and climate change adaptation through own contribution activity

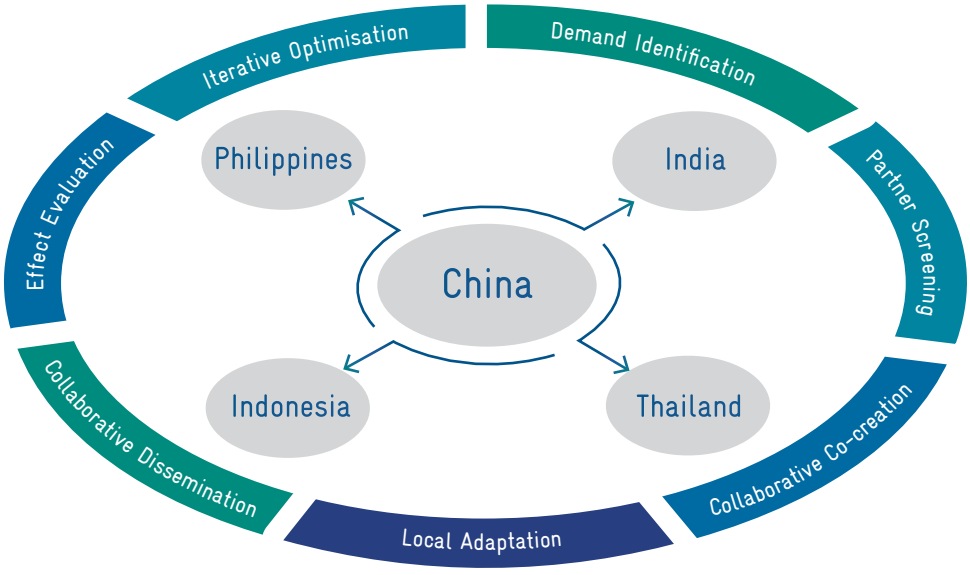
3.4 China's Contribution as Knowledge Partner

Definition

Within the Urban-Act project, China serves as the primary knowledge partner an actor that co-creates and shares practical know-how with others. Drawing on extensive experience in rapid urbanisation, climate governance and spatial planning, China contributes demand-driven support to regional partners by sharing practical policy approaches, planning methodologies and implementation examples tailored to the needs of other countries and cities. The role is endorsed by Chinese political counterparts and anchored with implementing partners — the National Centre for Climate Change Strategy and International Cooperation (NCSC), Tongji University and the Shanghai Urban Planning and Design Research Institute (SUPDRI). Distinct from typical knowledge partner constellations, China's engagement is guided by partner needs rather than its own interests.

The core mission to identify and disseminate suitable Chinese policy advice, technical expertise and replicable models that enable mutual, cross-country learning with regional peers and German technical partners.

Working Mechanisms as Knowledge Partner



Key Contribution to the project & Benefit for the Commissioner

As Urban-Act's Knowledge Partner, leveraging decades of practical experience in rapid urbanisation, integrated climate governance, and the nationwide rollout of spatial planning China served as a concrete implementation role model to other countries.

Through regional conferences, technical workshops, expert exchanges, study visits, and targeted capacity building and technical publications, China strengthened regional learning by translating domestic policy and planning practice into replicable approaches.

In the meantime, together with other regional partners like UCLG ASPAC and ESCAP, China supported partner countries in low carbon transport, climate resilient urban planning, and ecological spatial planning, while fostering long-term technical cooperation across the Asia Pacific region.

GIZ's Urban-Act China team served as a facilitator and trusted intermediary throughout this process, by connecting national ministries, local governments, research institutions and international partners, and creating platforms for policy dialogue, technical cooperation and peer-learning. Its role is not only to support the implementation of project activities, but also to ensure that knowledge is systematically generated, documented, translated into practical solutions and shared across partner countries.

The knowledge partnership also leveraged resources beyond Urban-Act. The cooperating Chinese Ministry of Ecology and Environment (MEE) and the implementation partner NCSC have financed the participation of stakeholders from partner countries in climate-related training programmes in China through South-South cooperation during the project implementation phase. Local governments in the project's Chinese pilot cities and Chinese implementing partners have also provided financial or in-kind contributions to peer exchanges with cities in other partner countries. These additional contributions showed solid commitments and increased peer-learning.

For the German commissioner (IKI/BMUKN), the partnership provides a structured mechanism to draw on relevant Chinese implementation experience while fully upholding the principles and requirements of the Federal Government's cooperation approach — particularly on the topics such as climate mitigation, adaptation, and urban resilience. All activities remain anchored in public climate objectives and are implemented with full transparency and in compliance with the environmental and social safeguards applicable under IKI.

The success of the partnership with China as knowledge partner rests on three pillars:

1. It strengthens regional peer learning by enabling partner countries to draw on existing Chinese and regional experience in low-carbon and climate-resilient urban planning, while adapting approaches to their own institutional and planning conditions.

2. It generates practical evidence and knowledge for wider policy discussions, as experience from implementation in China and exchanges with regional partners can provide inputs for international and European discussions on urban climate action.

3. It combines complementary expertise: cooperation with German research institutions, including the Technical University of Dortmund and the University of Stuttgart, adds German research and methodological expertise to Chinese and regional implementation experience, including approaches to safeguards, evaluation and transferability.

In addition, the knowledge partnership supports more systematic learning. Shared learning formats allow lessons from different partner countries to be compared tested and adapted. The combination of Chinese, German and regional expertise therefore supports the identification of approaches that can be relevant across different institutional and urban contexts.

Overall, the partnership enables Urban-Act to link Chinese implementation experience with German knowledge and regional peer-learning needs, creating a platform for testing, adapting and sharing approaches to urban decarbonisation and climate resilience across Urban-Act countries. It thereby strengthens the project's regional learning capability while making use of existing institutional capacities and mobilised financial and in-kind contributions.

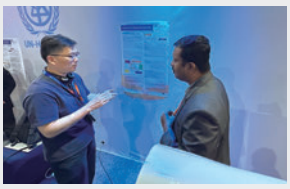


Highlight Achievements

Green urban development, climate services and ecological spatial planning

- National Climate Centre of China Meteorological Administration (NCC-CMA) exchange dialogue with Department of Public Works and Town & Country Planning (DPT) on the topic Climate Services (Bangkok, June 2024)
- Tongji University exchange dialogue with Office of Natural Resources and Environmental Policy and Planning (ONEP) on Climate of Ecological Spatial Planning (Bangkok, June 2024)
- Thailand delegation DPT (Department of Public Works and Town & Country Planning) of Ministry of Interior (MoI) to China, focusing on Green Urban Development (Beijing & Shanghai, September 2024)
- Thailand delegation Office of Natural Resources and Environmental Policy and Planning (ONEP) of Ministry of Natural Resources and Environment (MNRE) to China, focusing on Ecological Spatial Planning (Shanghai, August 2025)










"Thailand learned from China's example that Ecological Spatial Plan (ESP) should begin with developing shared data standards and a database, analysed through the lens of ecological networks and ecosystem services. Furthermore, ESP should be supported by local participation and continuous monitoring to translate regional plans into effective land-use practice."

- Sujitra Yootong -
Director of Urban Environment
and Area Planning Division, ONEP, Thailand



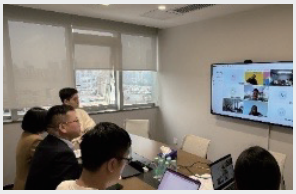
"Through face-to-face exchanges with teams from Thailand, Indonesia, India, and other countries under the Urban-Act project, we found that many Southeast Asian countries face challenges similar to those experienced by China in the process of urbanisation. Rapidly developing, high-density cities must address a wide range of issues, including urban waterlogging and flooding, ecological degradation, waste management, public transportation, community services, and affordable housing. China has accumulated substantial practical experience in many of these areas. The Urban-Act project has provided a valuable platform for sharing such experience and has laid a solid foundation for further cooperation in the future."

– Dr. Wang Xin –
Professor, College of Architecture and
Urban Planning, Tongji University, China

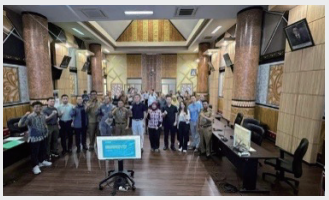
Low-carbon and digital transformation for efficient public transport operation

- Indonesian pilot cities (Padang & Medan) delegation to China (Xiamen, Shenzhen, Guangzhou, September 2023)
- Shenzhen Bus Group return visit to Indonesia (Padang and Medan, July 2024)
- Shenzhen Bus Group and Tongji University delegation to Indonesia (Jakarta, January 2026)











"The visit to Shenzhen provided us with first-hand experience of how a fully electric-powered public transportation system is operated. The entire transportation management ecosystem, particularly the electric buses operated by Shenzhen Bus Group, is highly efficient and has become one of the main choices for urban transportation among the public. Specially elevated roads for Shenzhen Bus Group, allowing the buses to avoid traffic congestion and operate on schedule.

The visit of the Shenzhen Bus Group delegation to Padang was highly beneficial, particularly during the discussions held in the Focus Group Discussion (FGD) following their field visits. During the FGD, the delegation provided valuable input based on their direct observations in the field, particularly regarding the preparations that the Padang City Government needs to undertake to ensure that the planned operation of electric buses can running success."

- Dr. Didi Aryadi, M.Si, CACP -
Assistant for Economic and Development,
Padang Local Government, Indonesia



"Under the Urban-Act framework, Shenzhen Bus Group (SZBG) participated in the public transport transition study in Padang and Medan, Indonesia, in collaboration with GIZ and local partners. Drawing on its experience as a public transport operator, SZBG contributed to the assessment of bus operations, technology, safety management and smart systems, and shared practical experience in bus electrification, digital transformation, safety management and energy efficiency.

We sincerely appreciate GIZ for the valuable opportunity provided through Urban-Act to work with partners in Padang and Medan. The project allowed us to share practical operating experience while gaining a deeper understanding of local needs. It reinforced our belief that successful public transport transition comes from adapting proven practices to each city's own operating context."

-Ethan Ma Yi-
Deputy General Manager
Shenzhen Bus Group, China

Own contribution and regional cooperation activities

- 9th UCLG ASPAC Congress (Yiwu, November 2023): Shared Chinese experiences on green finance and low-carbon transportation.
- Urban-Act Regional Training (Bangkok, June 2024): Shared Chinese good practice on low-carbon spatial planning in the Yangtze Delta Area.
- South-South Cooperation Training (Beijing, September 2025): Shared Chinese experiences of Climate Resilience Early Warning Systems on Extreme Weather









"The training conducted under the framework of South-South Cooperation, with the theme Early Warning System, provided significant benefits to the City of Padang, particularly because Padang is a city that is highly vulnerable to natural disasters. Understanding the importance of an effective early warning system can contribute significantly to reducing disaster risks for the community. This South-South Cooperation workshop was attended by countries that are highly vulnerable to disasters, particularly those caused by climate anomalies and extreme weather conditions, which can lead to typhoons, floods, landslides, and other disasters. By utilising satellite-based technology, disasters resulting from climate anomalies and extreme weather conditions can be predicted earlier, enabling governments and communities to take appropriate measures to mitigate disaster risks."

- Dr. Didi Aryadi, M.Si, CACP -
Assistant for Economic and Development,
Padang Local Government, Indonesia



"Throughout our cooperation journey, we have greatly valued this partnership. Under the Urban-Act project, we systematically reviewed EU experience, developed a locally tailored evaluation framework, and fed research outcomes into national policy drafting, embedding international expertise within China's context. To meet policymakers' needs and deliver replicable lessons for the Global South, we expanded our work, launching regional research, capacity building and complementary initiatives. We also joined South-South cooperation and training with Thailand and other partners to share China's practical experience.

Though the project has ended, our ties and common mission remain. We sincerely hope GIZ will continue our collaboration on wider platforms to boost the Global South's climate action capacity."

- Zhou Zeyu -
Deputy Director
Department of Policies and Regulations, NCSC, China

4. Conclusion and Future Perspective

China's urban development is shifting from poverty alleviation and rapid economic expansion to a new people-centred phase, with a focus on unlocking the potential of existing urban assets and promoting ecological and low-carbon development to achieve the nation's 'dual carbon' targets. The emphasis is shifting from 'building new' to 'managing well', enhancing the quality, resilience and efficiency of urban systems whilst safeguarding natural assets and public welfare. Looking ahead, China's urban development agenda will be shaped within a framework of comprehensive systematisation and governance in accordance with the law. At the same time, it will be further enhanced through sustainable partnerships and global mutual learning and interaction. This includes harnessing ecological co-benefits and establishing a comprehensive, law-based urban management system; simultaneously advancing the low-carbon transition, building climate-resilient infrastructure, and mainstreaming climate risks and opportunities into regional spatial planning and governance; as well as strengthening exchanges and communication with countries and cities around the world – sharing China's experiences and stories with other nations, whilst actively learning from global partners in this regard.

In this context, projects such as Urban-Act could provide a practical vehicle to bridge coordination gaps, strengthen institutional capacity, and translate national policy into bankable and scalable local action. By convening stakeholders across levels of government and sectors, enhancing rule-of-law-based urban management, and supporting climate-compatible spatial planning, Urban-Act contributes to long-term, regionally coordinated sustainable urban development. Going forward, the initiative can add value by:

- Supporting integrated urban planning that aligns climate targets with spatial, infrastructure, and investment decisions.
- Facilitating standardised, transparent data frameworks to enable cross-sector coordination and monitoring.
- Advancing climate-resilient, low carbon infrastructure pipelines, including nature-based solutions and climate risk assessment.
- Building capacity for diverse target groups including. government officials from different levels and also to international audiences.
- Catalysing co-financing and private sector participation to complement public resources and accelerate delivery.

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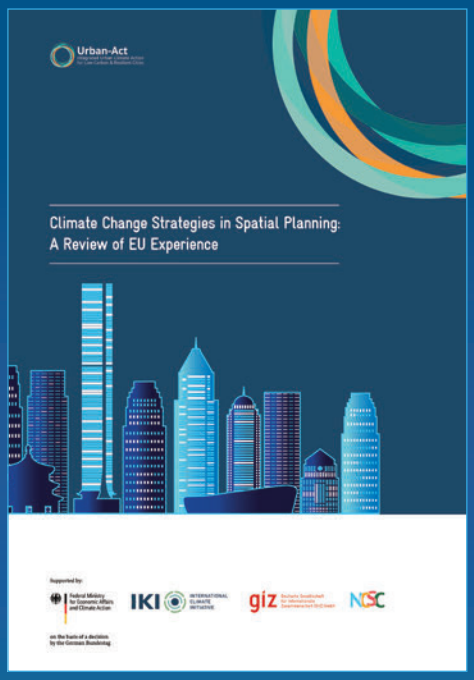
[14] Special Plan for the Non-motorised Transportation System of Xiamen (2025-2033)

Publications

In collaboration with Chinese implementation partners—including Tongji University (TJU), Shanghai Urban Planning and Design Research Institute (SUPDRI), and the National Centre for Climate Change Strategy and International Cooperation (NCSC)—the Urban-Act project has produced over 20 research reports and studies. These publications address critical topics such as:

- Low-carbon and resilient spatial planning
- Caborn accounting and control
- Urban biodiversity conservation planning
- Low-carbon urban transport planning
- MRV (Monitoring, Reporting, and Verification) mechanisms in territorial spatial planning system
- Inclusive, green, resilient urban development





Climate Change Strategies in Spatial Planning: A Review of EU Experience

Author:
National Centre for Climate Change Strategy and International Cooperation (NCSC)

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Summary

The report assesses the practical progress of spatial planning in addressing climate change within the European Union and selected member states. It analyses mitigation and adaptation strategies, outlining methods and key aspects for their integration. Based on EU experiences, the report provides recommendations for effectively incorporating climate change considerations into China's spatial planning system.

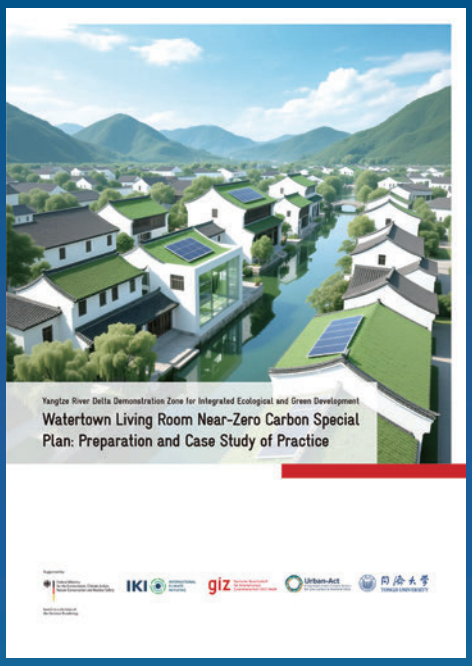
Key Findings

The EU's multi-level territorial spatial governance system supported by unified technical platforms such as European Spatial Planning Observation Network (ESPON) can systematically embed carbon reduction and climate adaptation into all planning tiers, which provides a complete institutional and technical reference for improving integrated spatial governance mechanism for responsible governmental authorities in all Urban-Act countries.

With the concrete examples from Germany, the Netherlands, Denmark and Sweden, it formulated differentiated spatial measures according to their core climate hazards including heatwaves, floods and urban sprawl. Such localised schemes offered valuable experience for Urban-Act countries to launch zone-specific resilient planning amid varied regional climate conditions.

The EU's "goal-strategy-action-indicator" whole-process management framework ealises the downward transmission of climate targets from macro strategies to realistic implementation , and this logical system can be introduced to strengthen the quantitative binding force of low-carbon spatial planning in all Urban-Act countries. Cross-department joint working mechanisms, visualised climate risk mapping and nature-based blue-green infrastructure are proven effective core tools for climate response, which can be prioritised in the revision of territorial spatial planning technical standards in all Urban-Act countries.





Watertown Living Room Near-Zero Carbon Special Plan: Preparation and Case Study of Practice (Executive Summary)

Author:
Tongji Architectural Design (Group) Co., Ltd. & Tongji University

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Summary

This report details the "Watertown Living Room Near-Zero Carbon Special Plan," China's first cross-provincial "dual carbon" plan for a key functional area. Located at the core of the Yangtze River Delta integration zone, the plan aims to operationalise carbon peaking and neutrality goals through a three-tier governance framework ("Unit-Subunit-Plot"). It establishes phased targets to reduce emissions by 60% by 2025 and over 80% by 2035. By integrating carbon indicators into statutory spatial planning and defining pathways for buildings, transport, and energy, the plan serves as a replicable model for regional green development.

Key Findings

As China's first cross-provincial near-zero carbon special plan for functional zones, the Watertown Living Room case establishes a cross-administrative collaborative planning mechanism, which provides replicable governance experience for trans-regional dual-carbon construction in integrated urban agglomerations.

The report adopts a supply-demand hybrid emission model to set staged carbon reduction targets under six development scenarios, and builds a three-tier (unit-subunit-plot) quantitative indicator system with mandatory and guided items, offering a mature target decomposition method for domestic detailed spatial planning.

Five systematic low-carbon implementation paths covering buildings, transport, ecology and industries are proposed, matching Jiangnan Watertown ecological characteristics, which supplies localised technical solutions for Watertown ecological carbon sink enhancement and emission cutting.

Practical implementation reveals distinct indicator adaptability differences among various functional blocks, and insufficient market incentive mechanisms restrict large-scale promotion, which puts forward optimisation ideas for future low-carbon supporting policy formulation.





Review's on China's Low-Carbon Spatial Planning Policies

Author:
Shanghai Urban Planning Design & Research Institute

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Key Findings

China has launched three batches of national low-carbon pilot cities covering all geographical regions, which have achieved remarkable results in decoupling economic growth from carbon emissions and accumulated preliminary low-carbon urban construction experience across different regional types.

China's five-level, three-category territorial spatial planning system serves a comprehensive governance carrier for dual-carbon goals, and relevant national guidelines have laid basic institutional support for integrating low-carbon requirements into all stages of spatial compilation and supervision.

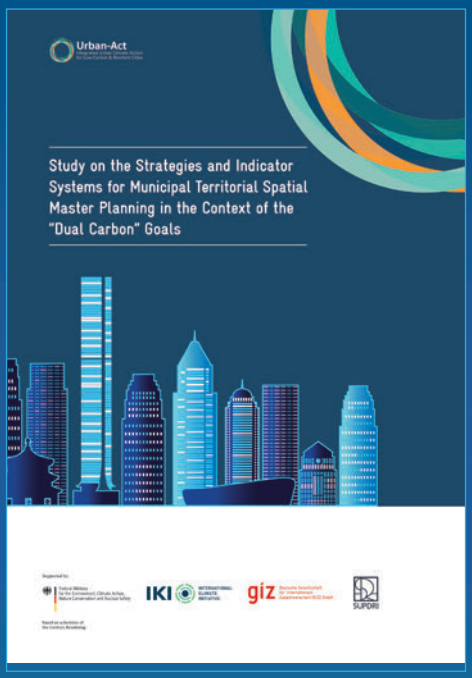
Pioneering practices in Shanghai and Beijing prove that embedding carbon peaking targets, energy intensity and ecological sink indicators into municipal master plans can effectively constrain urban carbon emission from the spatial source.

Mature planning modes of New York, London, Paris and Japan form a complete goal-strategy-indicator-action logic, providing systematic international references for China's low-carbon spatial planning innovation.

Summary

This report provides a comprehensive review of China's low-carbon spatial planning policies, identifying Territorial Spatial Planning (TSP) as a critical vehicle for achieving national "Dual Carbon" goals. It analyses the "1+N" policy framework and highlights key challenges, such as inconsistent carbon accounting standards and weak transmission mechanisms from high-level policy to local implementation. The report recommends integrating carbon indicators into the statutory "five-tier, three-type" planning system to translate targets into specific spatial controls. It also calls for establishing standardised technical guidelines for carbon monitoring, utilising digital platforms for precision governance, and enhancing inter-departmental coordination.





Study on the Strategies and Indicator Systems for Municipal Territorial Spatial Master Planning in the Context of the "Dual Carbon" Goals

Author:
Shanghai Urban Planning Design & Research Institute

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Summary

This report examines how municipal territorial spatial master planning can support China's "dual carbon" goals. It frames territorial spatial planning as a key instrument for translating national carbon peaking and neutrality targets into actionable local strategies. Drawing on domestic research, international cases, policy requirements, and existing technical standards, the report develops a planning framework linking carbon accounting, reduction and sequestration mechanisms, sectoral strategies, and indicator systems. It proposes targeted pathways across spatial patterns, transportation, energy, resource utilisation, and ecological environment, while also recommending a refined set of planning and evaluation indicators. The report thus offers a systematic reference for embedding low-carbon objectives into municipal spatial planning.

Key Findings

The study proposes a structured technical roadmap based on an "objectives–strategies–indicators–actions" framework. This approach aims to align planning efforts and coordinate implementation effectively.

To effectively manage carbon sources and sinks, planning strategies are centred on five key priority areas: spatial patterns, integrated transportation, energy supply, resource utilisation, and the ecological environment.

While China's existing guidelines and technical standards provide a foundation, the study notes a need for more systematic integration of specific carbon reduction mechanisms and quantifiable indicator controls that can be applied across the planning lifecycle (formulation, implementation, oversight, and evaluation).

Indicator systems should not be static; they must be integrated into the entire lifecycle of territorial spatial planning—from initial formulation through implementation and final evaluation—to ensure the effectiveness of low-carbon development strategies.





China's Spatial Planning Policies Relative to Climate Adaptation and Suggestions on Detailed Planning Optimisation

Author:
Xi'an City Planning & Design Research Institute

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Summary

This report explores China's spatial planning policies for climate adaptation, with a focus on embedding resilience into detailed territorial spatial planning. It outlines the evolution of the national planning system and synthesises key policies, technical standards, and city-level practices. The report identifies existing gaps in translating resilience concepts into spatial governance and highlights the role of detailed planning as the primary implementation layer. It then proposes an integrated framework linking resilience objectives, spatial strategies, and control indicators, and suggests sectoral pathways across spatial layout, infrastructure, water systems, transport, and ecology to support climate-adaptive urban development.

Key Findings

City-level cases including Beijing, Huangshi and Wuhan prove localised spatial resilience strategies can mitigate distinctive climate hazards, forming replicable models for megacities with complex climatic risks such as Xi'an.

The dual-tier unit-parcel detailed planning mechanism constructed in Xi'an provides an operable hierarchical carrier for decomposing climate resilience demands into micro spatial control.

Zoned pilot units classified by urban function are verified as an effective approach to launch differentiated climate adaptation governance at the block scale.

Multi-scenario climate simulation and real-time monitoring tools are essential to dynamically calibrate resilience indicators and address uncertain future climate risks.





Recommendations for an Evaluation indicator System to Support Low-Carbon & Resilient Urban Development in China

Author:
National Centre for Climate Change Strategy and International Cooperation (NCSC)

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Summary

This report develops a comprehensive evaluation indicator system to support low-carbon and resilient urban development in China. It builds on national policies, pilot practices, and existing technical standards, and integrates mitigation and adaptation objectives within the territorial spatial planning framework. The report proposes a structured indicator system covering spatial layout, transport, ecological spaces, buildings, and infrastructure, combining both quantitative and qualitative measures. It further outlines principles for indicator selection and methodologies for monitoring and evaluation, aiming to improve policy implementation, comparability, and practical application at the city level.

Key Findings

A five-category evaluation system covering space, transport, ecology, buildings and infrastructure is proved effective to translate dual-carbon and climate resilience targets into parcel-level spatial control standards under China's territorial planning system.

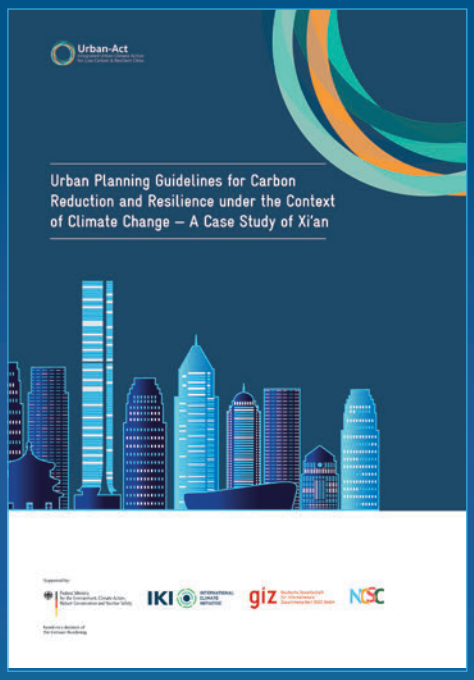
Separating binding indicators from guiding ones based on data availability and planning practicability can balance assessment rigor and local implementation flexibility.

Disparate indicator standards across national low-carbon and climate-adaptive city pilots hinder inter-city horizontal comparison, and the unified framework in this study solves this practical barrier.

Standardised annual self-assessment plus inter-department joint review forms a sustainable long-term supervision mechanism for urban low-carbon resilient construction.

The indicator calculation and scoring methods summarised in the research can be directly referenced by authorities to adjust local assessment rules and scale up proven urban climate solutions.





Urban Planning Guidelines for Carbon Reduction and Resilience under the Context of Climate Change – A Case Study of Xi'an

Author:
Xi'an City Planning & Design Research Institute
Tianjin University

Download the PDF file of this paper

Summary

This report proposes an integrated urban planning framework for carbon reduction and climate resilience, using Xi'an as a case study. It defines a unit-based approach—covering industrial, residential, renewal, and ecological units—and develops differentiated indicator systems and targeted strategies for each. The framework emphasises spatial optimisation, green buildings, renewable energy systems, low-carbon transportation, and enhanced ecological carbon sinks. It also introduces modular guidance combining carbon-reduction-led and resilience-led pathways, alongside practical case studies to demonstrate implementation. Overall, the report aims to translate national dual-carbon goals into actionable planning tools for sustainable and resilient urban development.

Key Findings

Four types of urban functional blocks in Xi'an (industrial, residential, renewal, ecological) show distinct carbon emission characteristics and climate risk features, which supports targeted classified planning governance.

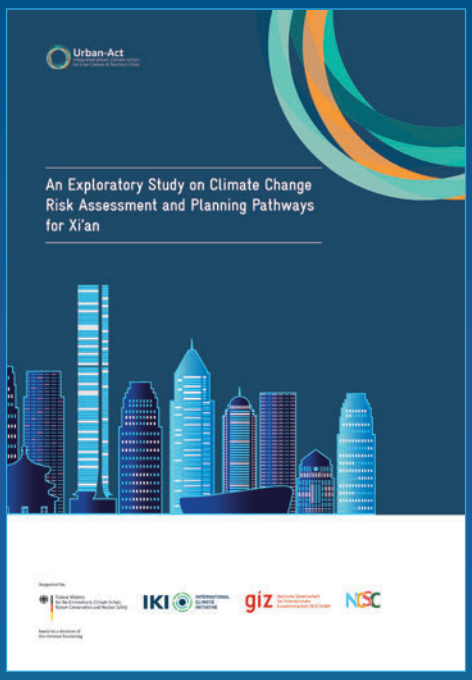
The classified indicator system equipped with near-term and long-term quantitative thresholds enables precise spatial control at the block scale for dual-carbon and resilience goals.

Dual modular strategies centred on carbon reduction and resilience enhancement provide flexible matching solutions for different block development priorities.

Taking Xi'an typical blocks as practical carriers, the research forms a complete set of land, building and infrastructure planning measures that can be directly applied in local detailed planning.

The indicator and strategy framework integrates the city's heat adaptation and cultural conservation demands, forming a localised planning toolkit suitable for ancient capital cities.





An Exploratory Study on Climate Change Risk Assessment and Planning Pathways for Xi'an

Author:
Xi'an City Planning & Design Research Institute
Beijing Climate Centre

Download the PDF file of this paper

Summary

This report investigates climate change risks in Xi'an and develops planning pathways for strengthening urban resilience within China's territorial spatial planning system. It combines climate trend analysis, hazard assessment, and spatial correlation analysis to identify Xi'an's principal risks—heat waves, pluvial flooding, and drought—and the key spatial factors that shape urban vulnerability and adaptive capacity. Building on these findings, the report proposes a multi-scalar resilience framework spanning master planning, unit-level planning, and plot-level control. By linking climate risk assessment with spatial strategies for land use, transport, ecological spaces, infrastructure, and buildings, it offers a systematic approach for embedding climate adaptation into urban planning practice.

Key Findings

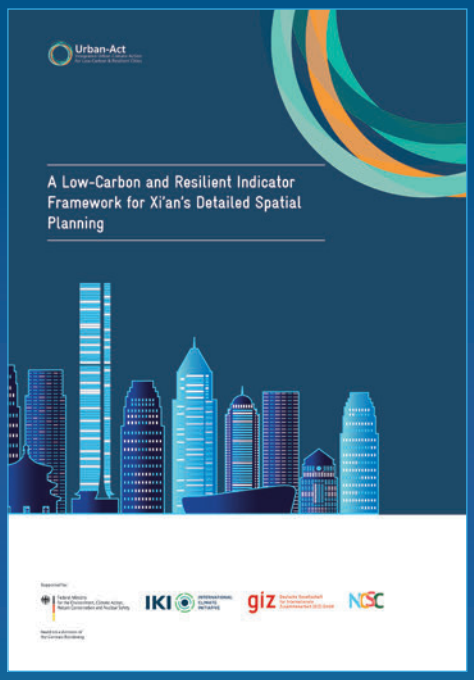
Resilience delivery mechanisms are split into master, unit and plot tiers matching China's territorial planning hierarchy, solving the problem that climate adaptation targets cannot be decomposed down to parcel design.

Tiered index thresholds differentiated by planning depth convert abstract resilience concepts into enforceable numerical rules for Xi'an's statutory detailed planning management.

Ventilation corridor layout and layered native greening schemes are custom-designed for Xi'an's enclosed basin topography, complementing generic sponge city strategies unsuitable for inland temperate cities.

The case-based multi-scale technical framework extracted from Xi'an's full planning practice creates a replicable operational template for other northern inland megacities lacking localised climate planning research.





A Low-Carbon and Resilient Indicator Framework for Xi'an's Detailed Spatial Planning

Author:
Xi'an City Planning & Design Research Institute
Tianjin University

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Summary

This report develops a low-carbon and resilient indicator framework for Xi'an's detailed spatial planning to meet "Dual Carbon" goals. It establishes a localised technical system, including carbon accounting models and differentiated indicators, across industrial, residential, regeneration, and ecological units. Through pilot demonstrations, the study provides standardised guidelines and strategies to integrate emissions reduction and climate resilience into block-level urban design and regulation.

Key Findings

The localised block carbon calculation system supplies unified quantitative technical support for environmental authorities to conduct city-wide carbon statistics and daily supervision.

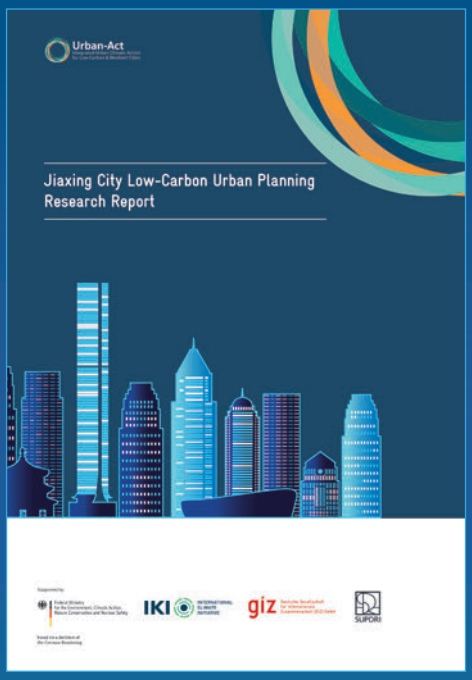
The differentiated indicator system for four functional zones delivers clear classified control benchmarks for low-carbon management within detailed planning.

Tiered short and long-term index targets help environmental departments implement phased carbon governance matching urban construction progress.

Dual strategy modules focusing on emission cuts and resilience allow environmental teams to roll out zone-specific climate improvement plans.

This integrated technical system unifies the climate governance standards shared by planning and environmental departments for cross-department coordination.





Jiaxing City Low-Carbon Urban Planning Research Report

Author:
Shanghai Urban Planning Design & Research Institute

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Summary

The report outlines a comprehensive strategy to integrate climate change considerations into the city's territorial spatial planning. Aiming to achieve national "dual carbon" goals and enhance urban resilience, the report evaluates Jiaxing's current greenhouse gas emissions and proposes a multi-level control approach for city-wide and district-level implementation. The core strategy focuses on five key pillars: optimising the energy mix, fostering sustainable industrial development, advancing green transportation systems, promoting low-carbon building technologies, and enhancing ecological carbon sinks.

Key Findings

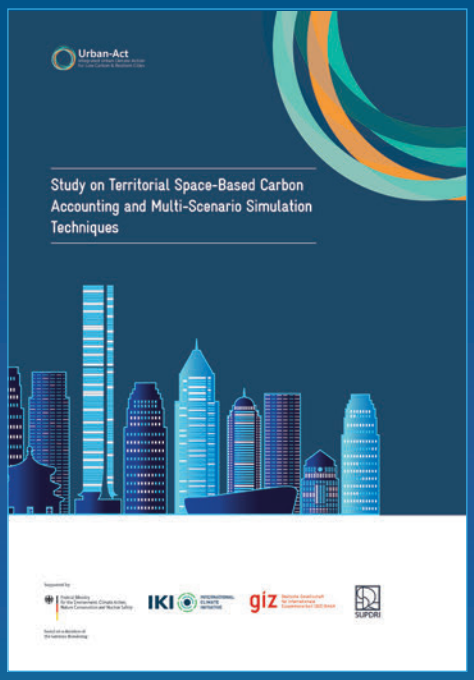
Jiaxing's water-town carbon accounting method can be replicated for other river-network cities in the Yangtze and Pearl River Deltas to complete city-wide carbon baseline surveys.

A two-tier (city-district-unit) spatial control system connects macro dual-carbon targets to specific quantitative indicators, forming a deliverable transmission logic for planning and environmental departments.

The integrated governance model combining low-carbon planning with sponge city and flood control is a valuable reference for humid plain cities to coordinate emission cuts and climate adaptation.

Three-tier ecological carbon sink zoning supplies a replicable layout optimization approach for cities rich in wetlands and river systems.





Study on Territorial Space-Based Carbon Accounting and Multi-Scenario Simulation Techniques

Author:

Shanghai Urban Planning Design & Research Institute

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Summary

This study establishes a localised technical framework for territorial space-based carbon accounting and multi-scenario simulation to support China's "dual carbon" goals. It reconstructs GHG inventory categories, covering buildings, transport, and industry, into a spatial lens to produce a "carbon emission map". By integrating "bottom-up" simulation techniques, the study enables planners to evaluate the carbon reduction potential of different spatial strategies. Tested through a Shanghai pilot, it provides a scientific foundation for integrating quantitative carbon analysis into municipal spatial master planning and digital governance platforms.

Key Findings

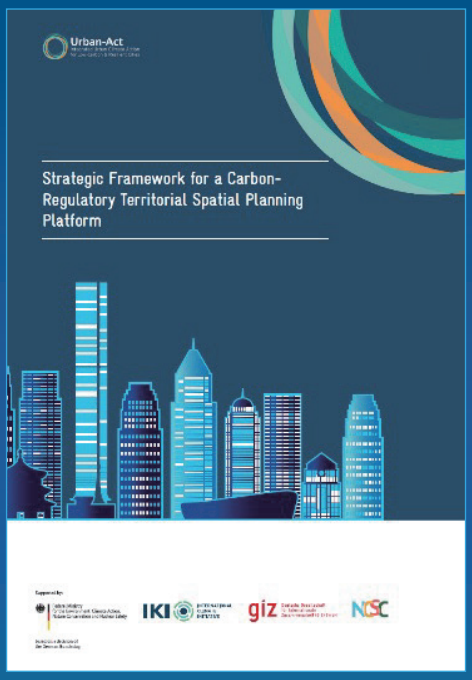
This research integrates China's territorial spatial planning system with international IPCC/GPC carbon inventory standards to form a universal spatial carbon accounting framework, which can be localized and applied by all global cities.

Developed based on Chinese urban pilot practices, the multi-scenario simulation method covering five core sectors can be referenced worldwide to quantify the carbon reduction benefits of spatial layout schemes.

The complete full-process carbon quantification technical route solves the weak carbon constraint problem in statutory plans, and provides operable standards for both Chinese authorities and overseas planning institutions.

The model combining domestic planning logic and overseas city cases supports differentiated carbon analysis and coordinated governance for Chinese cities as well as cross-border metropolitan areas.





Strategic Framework for a Carbon-Regulatory Territorial Spatial Planning Platform

Author:
Xi'an City Planning & Design Research Institute
Tianjin University

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Summary

This report provides a strategic framework for establishing a "Carbon-Regulatory Territorial Spatial Planning Platform" in Xi'an. Aligned with China's "Dual Carbon" goals, the document outlines a methodology focused on defining control boundaries, quantifying thresholds, and implementing enforcement mechanisms. Key components include a dual-level indicator system covering five domains—buildings, transportation, carbon sinks, industry, and municipal infrastructure, and the development of multi-scale carbon accounting models for precise data monitoring. The report proposes an end-to-end "carbon governance" workflow across the entire planning lifecycle, offering a scientifically grounded and actionable technical roadmap for Xi'an to optimise urban layout and achieve structural emission reductions.

Key Findings

A two-tier carbon indicator system linking master and detailed planning is developed based on Xi'an's practice, solving the universal issue of untranslated national carbon targets at parcel level for Chinese and global cities.

A multi-scale spatial carbon accounting model calibrated with local survey data is created, offering adaptable technical tools for inland metropolises worldwide.

A full-cycle carbon governance framework covering planning, approval and supervision fills the implementation gap, replicable for planning authorities of all regions.

Differentiated carbon control rules for four functional units (industry/residential/renewal/ecology) are proposed, supporting refined low-carbon management across Urban-Act cities.

The framework integrates Chinese dual-carbon policies and international IPCC/GPC standards, balancing local adaptability and cross-regional promotion value.





Public Bus System Assessment and Optimisation Report

Author:
Shenzhen Bus Group

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Summary

This report is a result of the collaboration between Urban-Act China and Indonesia. It focuses on improving urban bus operations through practical optimisations and highlights China's best practices, specifically Shenzhen's advancements in bus electrification and digital transit governance. The aim is to foster adaptable solutions and encourage the long-term, low-carbon sustainability of urban transport in Indonesia.

Key Findings

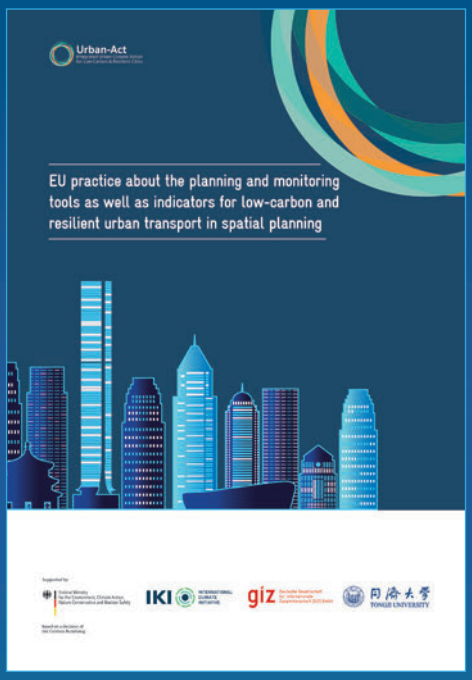
The report conducts a detailed assessment of the public bus transit systems in Padang and Medan, Indonesia, focusing on four main pillars: bus operations, technical engineering, safety management, and intelligent systems.

It evaluates local policies and regulations in Padang and Medan, highlighting the critical role of regional policy in enabling the transition to green public transport.

Shenzhen Bus Group's experience is utilised as a core case study to demonstrate proven best practices in bus electrification, digital transformation, safety frameworks, and carbon reduction.

The report provides actionable recommendations for system optimisation, including specific pathways for operational service enhancement, technical electrification transition, safety management optimisation, and digitalisation.





EU practice about the planning and monitoring tools as well as indicators for low-carbon and resilient urban transport in spatial planning

Author:
Tongji University

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Summary

This report evaluates EU practices in planning tools and monitoring indicators for low-carbon and resilient urban transport. Centred on the Sustainable Urban Mobility Planning framework, it explores how spatial governance can optimise transport structures and enhance urban climate resilience. Key highlights include the establishment of a multidimensional indicator system (environmental, social, and economic), the introduction of advanced simulation tools for carbon trend forecasting, and the sharing of German and EU expertise in public transit priority and non-motorised infrastructure. The study provides essential international benchmarks and technical pathways for integrating low-carbon transport strategies into China's territorial spatial planning.

Key Findings

The EU's Avoid-Shift-Improve framework and standardised SUMP planning system deliver a universal methodology to break down high-level climate goals into local transport spatial schemes, usable for all cities across Urban-Act regions.

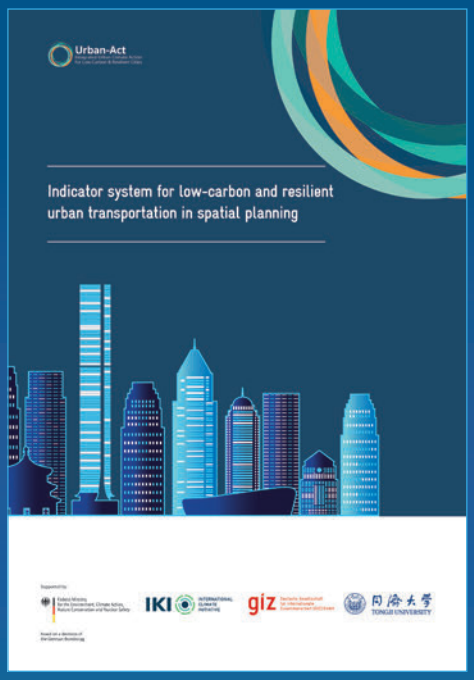
The multi-tier policy delivery system matched with diversified EU funding instruments creates a replicable governance-finance linkage model for regional mobility planning worldwide.

Integrated climate risk evaluation workflows built on TEN-T, Climate-ADAPT and standarised vulnerability tools offer a full-process resilient transport planning template for all urbanised regions.

Comprehensive indicator and monitoring systems represented by Bremen SUMP address the global shortage of quantifiable assessment benchmarks for low-carbon mobility interventions.

EU cross-border regional projects establish mature collaborative spatial planning mechanisms, applicable to transnational and inter-city agglomerations in all Urban-Act countries.





Indicator system for low-carbon and resilient urban transportation in spatial planning

Author:
Tongji University

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Summary

This report reviews indicator systems for low-carbon and resilient urban transportation in spatial planning, comparing China's practices with international experiences. It highlights the role of the Avoid–Shift–Improve (A-S-I) framework in guiding sustainable mobility and finds that China's current system emphasizes public transport and green travel, but lacks focus on non-motorized transport, multimodal integration, and demand management. The report also notes that resilience indicators remain underdeveloped, with a predominant focus on infrastructure rather than system adaptability. It recommends building a more integrated, human-centred indicator system that strengthens active mobility, improves monitoring mechanisms, and incorporates comprehensive resilience metrics across different disaster stages.

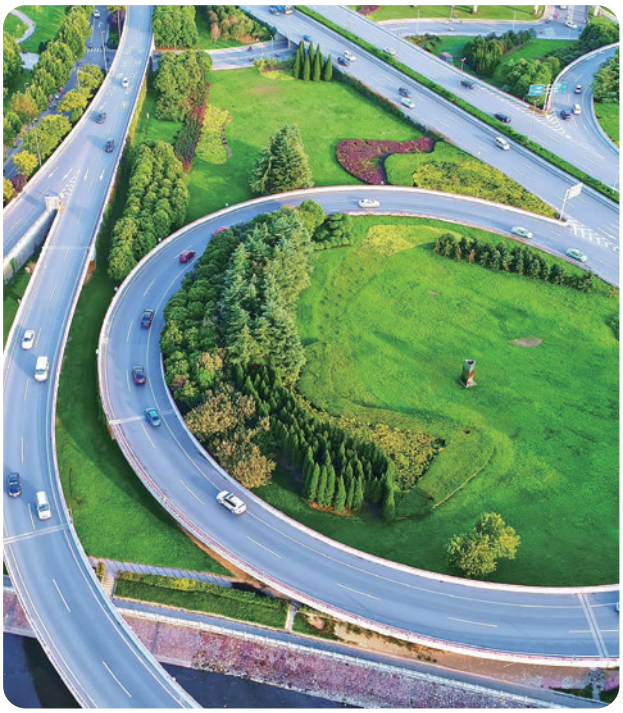
Key Findings

The A-S-I (Avoid-Shift-Improve) framework provides a universal logical framework for constructing low-carbon transport indicator systems, applicable to all cities across Urban-Act regions to sort emission-reduction metrics by priority.

International systems including SUMI and Bremen SUMP cover full dimensions of carbon, accessibility and social equity, forming standardized measurable benchmarks that fill the indicator quantification gap for most global cities, and can be referenced to upgrade China's territorial planning evaluation indexes.

Current low-carbon indicator frameworks of various countries generally attach insufficient weight to non-motorized travel and land-use demand control; the research puts forward universal optimization directions adaptable to both European cities and China's multi-level planning management system.

Most European nations only set scattered accessibility-oriented transport resilience indicators without a complete whole-process assessment system; the RESIN project and UAST tool offer complete pre-disaster/disaster/post-disaster indicator logic for all urban regions worldwide.





Research Report on Key Technologies for Monitoring and Assessing Low-Carbon and Resilient Urban Transportation in Spatial Planning

Author:
Tongji University

Download the PDF file of this paper

Summary

This report analyses indicator systems for low-carbon and resilient urban transportation in spatial planning, focusing on China and international practices. It highlights that while China has established a structured indicator framework emphasising green mobility and public transport, gaps remain in active transport, multimodal integration, and resilience assessment. By comparing international cases, the report identifies more comprehensive and adaptive approaches. It suggests strengthening integration between land use and transport, improving monitoring systems, and developing a more complete resilience indicator framework covering different disaster stages.

Key Findings

The A-S-I framework delivers universal three-step decarbonisation logic for all Urban-Act cities, compatible with China's territorial planning system.

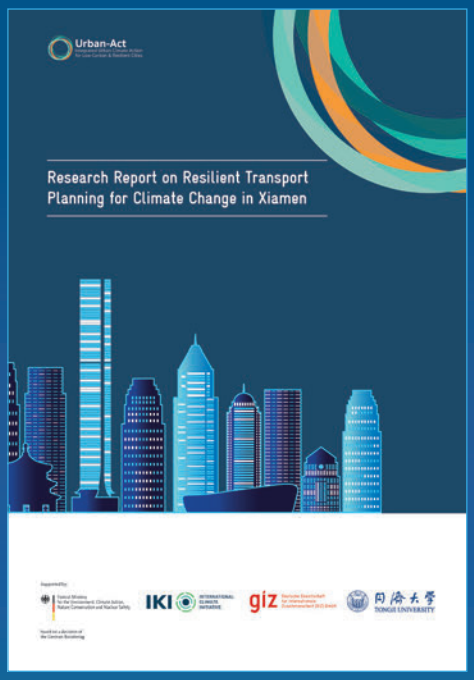
The intra/inter-city carbon accounting model follows international standards and has been validated with Xiamen's real data for domestic and global use.

The multi-dimensional transport indicator system fills carbon monitoring gaps in planning codes of both China and other countries.

Three sets of spatial low-carbon strategies summarised from global cases suit various cities in China.

The LLM-supported decision tool enables multilingual cross-border carbon analysis and can be applied in China's transport planning.





Research Report on Resilient Transport Planning for Climate Change in Xiamen

Author:
Tongji University

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Summary

This report examines resilient transportation planning in Xiamen under the challenges of climate change, focusing on how urban transport systems can better adapt to risks such as extreme weather and flooding. It analyses current vulnerabilities in infrastructure and mobility systems and proposes strategies to enhance resilience through improved network connectivity, emergency response capacity, and climate-adaptive spatial planning. The report highlights the importance of integrating resilience into existing planning frameworks and recommends strengthening monitoring systems, adopting smart technologies, and promoting coordinated governance to ensure transport system stability and rapid recovery.

Key Findings

This study builds a flood-oriented transport resilience assessment framework applicable to all coastal Urban-Act cities, and it is validated with Xiamen's multi-source spatial big data for Chinese coastal city reference.

It identifies the universal flaw that global disaster prevention planning only uses resident population instead of disaster-exposed population to allocate emergency facilities, and provides spatial correction methods. se coastal city reference.

The GIS flood simulation and shelter matching model can be localised for flood-prone cities worldwide; its district-level resource balancing logic also optimises China's cross-district emergency coordination mechanism.

The classified spatial optimisation strategies for emergency shelters, transport corridors and logistics hubs offer replicable resilience upgrading paths for coastal metropolises across China's and Urban-Act coastal agglomerations.





Research Report on the Quantitative Assessment and Monitoring of Carbon Emissions from Urban Passenger Transport

Author:
Tongji University

Download the PDF file of this paper

Summary

This report explores the development of indicator systems for low-carbon and resilient urban transportation within spatial planning. It reviews China's existing policies and evaluation system under the Avoid-Shift-Improve (A-S-I) framework, noting strengths in promoting public transport and green mobility, while identifying gaps in active mobility, multimodal integration, and resilience planning. By comparing international practices, the report highlights more comprehensive and people-oriented approaches. It recommends improving indicator systems through better integration of land use and transport, stronger monitoring mechanisms, and the inclusion of climate resilience across all stages of transport planning.

Key Findings

The report establishes a quantitative assessment framework for urban passenger-transport carbon emissions grounded in the Avoid-Shift-Improve (A-S-I) strategy, differentiating calculations for intra-city and inter-city transport.

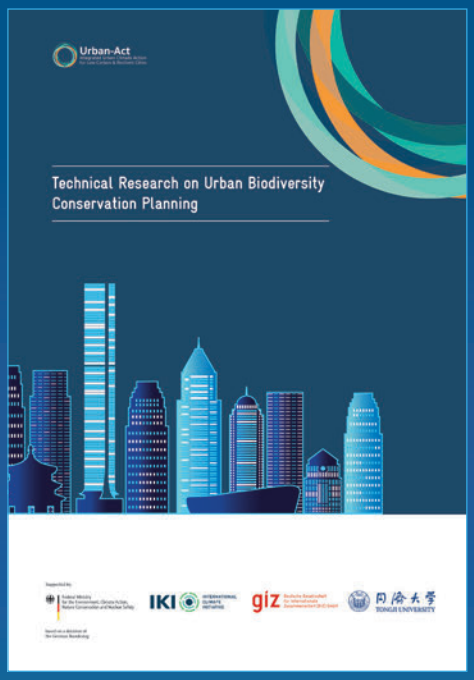
Decarbonisation planning is categroised into three strategic pillars: reducing travel demand through compact, mixed-use urban design (Avoid); promoting transit-oriented development and active mobility (Shift); and enhancing electric mobility infrastructure (Improve).

A comprehensive evaluation system is established, proposing 27 specific indicators grouped into three main categories: spatial structure, sustainable (green) mobility, and energy consumption.

The study evaluates four emission estimation methodologies—top-down, bottom-up, aggregate-structure, and life-cycle assessment (LCA)—aligned with IPCC guidelines to accommodate varying levels of city data availability.

A prototype decision-support system utilising a large language model (LLM) was developed. It integrates an urban transport database and a planning case library with visualisation and analytical tools to help technical staff evaluate emissions and formulate city-specific mitigation measures.





Technical Research on Urban Biodiversity Conservation Planning

Author:
Tongji University

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Key Findings

Urban biodiversity conservation planning translates policy into spatial measures and must be institutionally aligned within the broader Territorial Spatial Planning (TSP) framework.

A systematic five-step framework was developed, comprising multi-source data integration, habitat quality assessment, species distribution mapping, ecological network construction, and management recommendations.

The methodology was empirically tested in Xiamen, utilising six representative focal bird species (e.g., Chinese Egret, Saunders's Gull) to assess baseline conditions and development pressures.

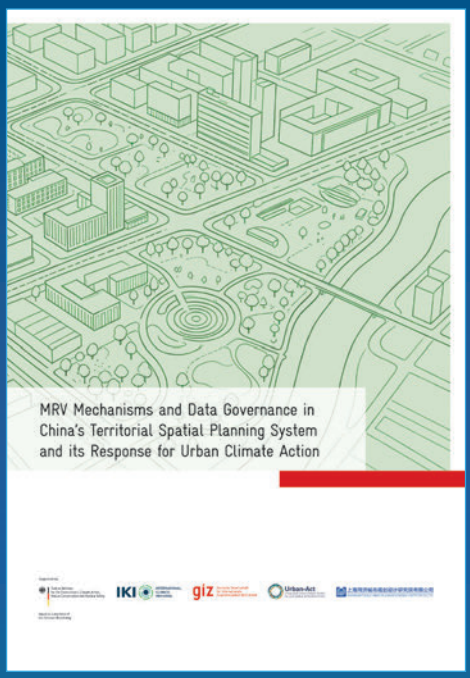
By calculating a Species Disturbance Index for habitat patches, the study successfully identified core ecological source areas, buffer zones, and ecological corridors to establish a spatial protection network.

Implementation strategies focus on optimising ecological spatial patterns, advancing ecological restoration, integrating biodiversity indicators into performance evaluations, and promoting synergies with climate-change adaptation.

Summary

This report presents a comprehensive methodology for integrating urban biodiversity conservation into territorial spatial planning. The approach is organised into a structured five-step process: multi-source data integration, habitat quality assessment, species distribution mapping, ecological network construction, and strategic implementation. To illustrate its practical application, the methodology was piloted in Xiamen. Drawing on the identified habitat network, targeted biodiversity conservation recommendations were developed for Xiamen. These include optimising ecological spatial patterns, strengthening ecological restoration efforts, and incorporating additional biodiversity indicators into performance evaluation systems.





MRV Mechanisms and Data Governance in China's Territorial Spatial Planning System and its Response for Urban Climate Action

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Summary

This report adapts the concept of MRV (Monitoring, Reporting, and Verification) from international climate policy to the field of territorial and spatial planning, expanding its original scope. It evaluates the current application of MRV in urban spatial planning, identifies key challenges, and provides actionable recommendations—all through an assessment of selected local spatial plans in China.

Key Findings

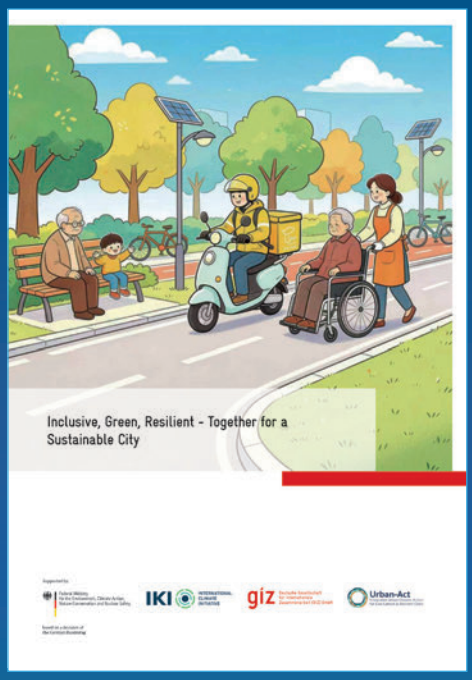
The report redefines MRV beyond conventional carbon accounting, positioning it as a closed-loop planning governance mechanism that links monitoring, reporting, verification, evaluation, policy feedback, and dynamic plan adjustment to improve urban climate governance.

Current MRV systems effectively monitor planning implementation but remain insufficiently climate-responsive. Critical datasets—including GHG emissions, energy consumption, transport activity, building performance, carbon sinks, and climate risks—remain fragmented, inconsistently standardised, and weakly integrated across sectors.

Pilot experiences demonstrate that integrating climate data into territorial spatial planning is feasible, supported by digital platforms, cross-departmental coordination, and spatially explicit indicators for resilience, mitigation, and adaptation.

The report recommends strengthening planning MRV through institutional coordination, integrated climate data governance, standarised climate-performance indicators, and stronger links between MRV outcomes, policy adjustment, and incentive mechanisms, enabling territorial spatial planning to become a core platform for measurable, adaptive, and evidence-based urban climate action.





Inclusive, Green, Resilient – Together for a Sustainable City

Author:
GIZ

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Summary

Climate risks are unequally distributed, shaped by social structures and unevenly felt based on gender, occupation, physical and mental conditions. This study focuses on three vulnerable groups: people with disabilities, domestic workers and food delivery workers. Using questionnaires and interviews, it explores their real experiences amid extreme climate, identifying common institutional barriers and group-specific risks. It aims to raise policymakers' awareness of marginalised communities' climate vulnerability and encourage cross-sector efforts to build climate-resilient urban planning, construction and governance.

Key Findings

This report identifies extreme weather as a systemic crisis disproportionately impacting persons with disabilities, female domestic workers, and delivery workers. Current urban governance and infrastructure, predicated on able-bodied users in stable conditions, structurally fail these groups, creating a "fair-weather" bias.

Climate risks are not merely natural hazards but are deeply embedded in institutional blind spots. Whether through rigid platform algorithms, inaccessible transit, or inadequate emergency protocols, the burden of climate stress is currently transferred entirely onto individuals. These groups lack institutional safety nets, forced to absorb financial, health, and safety consequences alone.

Policymakers must embed inclusive, intersectional design into all urban planning. The essential mandate is to move climate risk from an individual burden to a shared responsibility, requiring collaborative action between governments, platforms, employers, and society to protect marginalised populations.



Summary of Policies

Chinese Policy Framework and Commitments against Climate Change and Support Low-carbon & Resilient Urban Development

Released by	Name of the Policy	Description of the Policy
State Council of the People's Republic of China (15/08/2025)	Opinions on Promoting High-quality Urban Development	The Opinions set the development of modern people-centred cities as the primary overarching objective. It advances urban regeneration and intensive urban development alongside progress in green and low-carbon transition, spatial layout optimisation, infrastructure renewal, enhanced public service provision, urban resilience and public safety, plus intelligent urban governance, so as to speed up the transformation mode of urban development. The policy document lays out staged targets: marked improvements in the development of modern people-centred cities are to be realised by 2030, with the construction of such cities largely accomplished by 2035.
State Council of the People's Republic of China (02/05/2025)	Opinions on Continuous Advancement of Urban Renewal Initiatives	The Opinions advocate the sustained delivery of urban regeneration underpinned by sustainable renewal approaches. Priorities cover the refurbishment of existing buildings, the regeneration of old residential areas, the development of full-function communities, the redevelopment of urban villages, infrastructure renewal, ecological rehabilitation and the conservation of cultural heritage. The document sets out targets for marked strides in urban regeneration by 2030, including a refined institutional framework, tangible breakthroughs in the shift of urban development modes and upgraded living conditions for residents.
State Council of the People's Republic of China (05/07/2026)	The 15th Five-Year Plan Action Plan for Carbon Peaking	The Plan is grounded in the pivotal carbon peaking phase and rolls out all-round energy conservation and carbon reduction initiatives spanning energy, industry, transport and other sectors, mapping out a distinct pathway for China's green economic and social transformation over the next five years.
State Council of the People's Republic of China (21/06/2026)	The 15th Five-Year Plan for Building a Beautiful China	Taking the dual carbon targets as its fundamental benchmark, the Plan pursues source governance through carbon peaking progress and the green low-carbon transition to accelerate the holistic green transformation of economic and social development. It establishes 18 indicators grouped into four domains: ecological upgrading, coordinated pollution and carbon reduction, ecosystem conservation and environmental risk control. Of these metrics, six are mandatory and twelve indicative targets. Mandatory targets (by 2030) include: national PM2.5 concentrations within prefecture-level cities and above to be kept under 27 μg/m³; a 17% reduction in carbon emissions per unit GDP; non fossil fuels making up 25% of total energy consumption.
State Council of the People's Republic of China (22/05/2026)	The 15th Five-Year National Urban Renewal Plan (2026-2030)	Being the first national dedicated plan for urban renewal, it sets out 10 key indicators, 23 priority tasks and 14 flagship projects and initiatives. The Plan puts forward pivotal policy measures covering three categories: renovation of old urban residential compounds, construction of full-function communities, upgrades to public venues, public green spaces and non-motorised transport networks; regulated mixed spatial usage to raise the adaptability of detailed territorial spatial planning; and the green low-carbon transition in urban development for enhanced urban safety and resilience.
State Council of the People's Republic of China (10/2022)	Outline of National Territorial Spatial Planning (2021–2035)	This landmark national territorial spatial plan for cross-plan integrated coordination is compiled by the Ministry of Natural Resources (MNR) in conjunction with relevant national authorities. It aims to optimise the functional structure of urban spaces within urban development boundaries and enhance urban spatial quality, alongside defining a major initiative to build the Comprehensive Spatial Planning Observation Network (CSPON). (The Outline remains undisclosed by government authorities.)

Released by	Name of the Policy	Description of the Policy
State Council of the People's Republic of China (27/12/2025)	Action Plan for Integrated Solid Waste Management	The Plan aims to establish an integrated solid waste governance system covering the full supply chain, encompassing source waste minimisation, in-process regulation, end-use recycling and pollution-free management. It also specifies two core measurable targets for attainment by 2030: comprehensive utilisation of bulk solid waste reaching 4.5 billion tonnes, and the recycling volume of primary renewable resources hitting 510 million tonnes.
General Office of the State Council (05/01/2026)	National Emergency Plan for Low-Temperature, Rain, Snow and Freezing Disasters	The Plan aims to improve institutional provisions for the prevention and response relating to low-temperature, snow, ice and freezing events. It establishes tiered monitoring and early warning systems, sets four grades of national emergency response criteria, builds inter-departmental coordination frameworks, so as to enhance urban climate resilience against climate change.
Ministry of Natural Resources (MNR) & Ministry of Housing and Urban-Rural Development (MOHURD) (31/12/2025)	Notice on Several Measures for Further Supporting Urban Renewal Actions	The Policy, jointly issued by the Ministry of Natural Resources (MNR) and the Ministry of Housing and Urban-Rural Development (MOHURD), sets out concrete measures to further support urban renewal. It aims to strengthen inter-ministerial coordination and policy alignment, enhance cooperation between local authorities, optimise implementation measures, address key challenges, and promote the sharing of practical experience.
Ministry of Natural Resources (MNR) (23/03/2023)	Notice on Strengthening Detailed Territorial Spatial Planning	The Policy clarifies that China's future detailed territorial spatial planning should transition from an expansion-focused modes to a model balancing new construction work with the optimisation and renewal of existing urban spaces. It requires detailed planning to promote compact, green, and high-quality urban development, while reinforcing its pivotal role within the five-level, three-category territorial spatial planning system as the key implementation tool linking strategic and operational planning. The Policy also positions detailed planning as an essential instrument for optimising urban and rural spatial structures, improving functional allocation, and stimulating development vitality. It requires local governments to fully harness this planning tool.
State Council of the People's Republic of China (12/01/2025)	Implementation Opinions on Developing Pilot Zones for a Beautiful China	The Implementation Opinions promote the development of Beautiful China Pioneer Zones through a tiered and region-specific strategy, prioritising pollution prevention and control, environmental quality improvement, and public well-being enhancement. It support around five provinces, 50 cities, and 100 counties in pilot pioneer-zone, with the aim of fostering replicable practical practices and institutional innovations by 2027.
Ministry of Ecology and Environment (MEE) (10/05/2022)	National Strategy for Climate Change Adaptation 2035	The Strategy, jointly issued by 17 government departments, including the Ministry of Ecology and Environment (MEE) and the Ministry of Natural Resources (MNR), represents a key instrument for delivering China's national proactive climate change response strategy and scaling up climate adaptation efforts. It adopts an integrated approach across multiple dimensions, identifies priority actions and supporting measures for future climate adaptation work, and mainstream climate adaptation considerations within territorial spatial planning. The Strategy also defines climate adaptation priorities for China's eight major geographical regions and five key strategic zones, thereby establishing a multi-level regional framework for climate change adaptation.

Released by	Name of the Policy	Description of the Policy
Ministry of Ecology and Environment (MEE) (28/05/2025)	Construction Plan for the National Standards System on Addressing Climate Change	The Plan aims to strengthen the top-level design of China's national standards system for climate change. Closely aligning with the objectives and tasks of Beautiful China Initiative alongside climate change response work, it focuses on strengthening foundational capacities for climate action while addressing the needs of both climate change mitigation and adaptation. The Plan seeks to accelerate the establishment of a scientific, practical, systematic, and well-regulated national climate change standards system, thereby supporting the development of new quality productive forces, promoting the green and low-carbon transformation of economic and social development, and advancing the construction of a Beautiful China.
National Energy Administration (NEA) (26/06/2026)	Action Plan for Energy Conservation and Carbon Reduction in the Energy Sector (2026–2028)	The Action Plan is framed around China's carbon peaking and carbon neutrality goals and focuses on optimising the energy mix, improving energy efficiency, strengthening technological innovation, and enhancing policy support. It integrates energy conservation and carbon reduction across the entire energy supply chain—from production and storage to distribution and consumption—while accelerating the substitution of fossil fuels with non-fossil energy to support cap coal and oil consumption level and deliver a system-wide green economic transition. The Plan sets a target of increasing the share of non-fossil energy in total energy consumption by around one percentage point annually up to 2028.
National Development and Reform Commission (NDRC) & National Energy Administration (NEA) (13/06/2026)	The 15th Five-Year Plan for the Development of a New Energy System	The Plan takes China's carbon peaking and carbon neutrality goals as its guiding framework for accelerating the development of a clean, low-carbon, safe, and efficient new energy system. It sets clear targets for 2030, including boosting the country's total domestic energy production capacity to 5.8 billion tonnes of standard coal equivalent, securing consumption level for coal and oil, raising the share of non-fossil fuels in total energy use to 25%, increasing wind and solar capacity to over 50% of total installed power capacity, and ensuring that non-fossil sources generate 50% of the country's overall electricity output.
National Development and Reform Commission (NDRC) & National Energy Administration (NEA) (06/07/2026)	The 15th Five-Year Plan for the Development of Renewable Energy	Anchored to the carbon peaking and carbon neutrality targets, the plan fosters the high-quality advancement of renewable energy, with concrete quantitative benchmarks laid down for 2030 as follows. Total renewable energy consumption shall reach roughly 1.8 billion tonnes of standard coal equivalent, total installed capacity of renewable power generation shall stand at approximately 3.5 billion kilowatts, and annual power output shall hit around 6 trillion kilowatt hours. Total installed capacity for wind and solar power will exceed 2.8 billion kilowatts, accounting for more than 50% of the country's overall installed power capacity, with annual generation surpassing 4 trillion kilowatt hours to make up 30% of national total electricity production. The scale of non electric applications of renewable energy will grow 1.5 times compared with the 2025 baseline, equating to roughly 150 million tonnes of standard coal equivalent. Over the course of the 15th Five Year Plan period, the country will add in excess of 300 million kilowatts of dependable peak shaving generating capacity from renewable energy sources.
National Development and Reform Commission (NDRC) (03/07/2026)	The 15th Five-Year Plan for A Circular Economy	The Plan outlines the guiding principles, key objectives, and priorities for developing the circular economy during the 15th Five-Year Plan period. It sets targets for 2030, including increasing resource productivity by around 16% compared with 2025 levels, raising the annual comprehensive utilisation of bulk solid waste to around 4.5 billion tonnes, increasing the annual utilisation of major recyclable resources to around 510 million tonnes, and expanding the resource recycling industry to a value of RMB 8 trillion (ca. 1.19 trillion USD). By 2035, it aims to establish a high-quality circular economy system with resource efficiency reaching internationally advanced levels.











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