

Green Development and Climate Adaptation for Urban and Rural Areas:

Climate adaptation in a changing world

We focused on

- providing insights into the requirements for creating a resilient society, equipped to handle extreme weather events and a changing climate,
- establishing a five-step framework to examine urban capabilities for climate adaptation and providing a priority list of climate-resilience measures, and
- combining empirical research and case studies to identify climate adaptation gaps and addressing these gaps with policy recommendations. Cases include the Yangtze River Delta, Pearl River Delta, Chengdu-Chongqing area, and Rhine-Meuse-Scheldt Delta.

We found

- Climate change is already here—accelerating climate adaptation is critical and urgent.
- Climate adaptation has multiple benefits: it not only reduces the disaster risk of climate change, but also represents an important opportunity to promote green development.
- New insights into the requirements for creating a climate-resilient society can be gained through studying the revision of adaptation policies and practices triggered by extreme events.

Assessment Framework for Climate Resilience: Five capacities

- **Threshold capacity:** the ability to raise thresholds to avoid problems.
- **Coping capacity:** the ability to better cope with problems.
- **Recovery capacity:** the ability to recover after a disaster.
- **Adaptive capacity:** the ability to adapt to future conditions.
- **Transformative capacity:** the ability to steer developments toward a new course.

We recommend



elevate the governance priority for climate adaptation and urgently integrate climate adaptation in all policy domains,



support regional and local authorities and communities with the implementation of climate adaptation interventions,



establish and commit to future adaptation goals and targets across all policy domains,



accelerate and improve climate adaptation by:



pay attention to social equity and gender issues in climate adaptation and accelerate the adaptation capacity of less developed regions and vulnerable groups.

- acknowledging the increasing intensity and frequency of weather extremes,
- supporting exploration, stress tests, and the development of action plans at local, regional and national levels,
- integrating stakeholder participation in climate-resilient future planning and design,
- developing supporting laws, regulations and long-term adaptation funds.

China's Pathways for Achieving Carbon Neutrality and Global Climate Governance

We focused on

- providing climate change technical support for China's 15th Five-Year Plan and **updated nationally determined contributions** within the Paris Agreement, and
- exploring global cooperation on promoting a low-carbon energy transition in developing countries and facilitating global investment and trade in green products.



We found

- Addressing climate change remains an important window for international cooperation. However, uncertainties around climate policies increase as they interact with broader global turbulence on trade and security.
- As China continues its energy transition, with renewable energy poised to become the country's main source of power, it's crucial to focus on **renewable energy integration**.
- Through technological innovation, industrial policies, robust supply chain, and engineering capabilities, China is a leading **global provider of renewable energy products** and contributes to the reduction in low-carbon technology costs.
- It will be key for China to further unleash the potential of the market, technology, and policies to address energy transition challenges.



We recommend



setting a target for absolute carbon emission reduction by 2035 and combine ambitious goals with pragmatic actions in China's updated nationally determined contributions.



promote the consumption of wind and solar power based on local conditions and support low-carbon technology innovation through green industry classifications, market mechanisms, and subsidies.



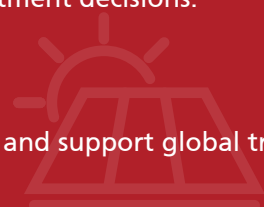
propose targets for controlling total carbon emissions within China's power industry carbon market in the near term, and set a ten-year reduction expectation for total carbon emissions



contribute to reform of the international financial architecture and incorporate climate criteria in China's export credit policies and overseas investment decisions.



promote the localization and internationalization of the supply chain for electric vehicles, lithium batteries, and solar cells, and support global trade and investment in green technologies.



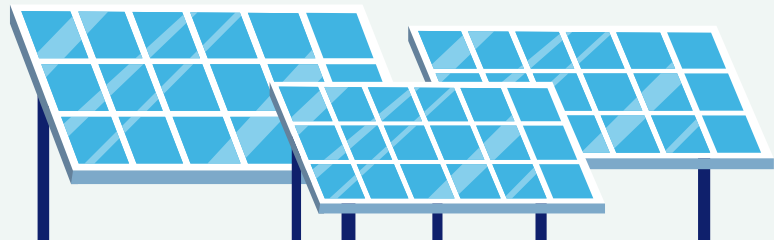
Collaborative Mechanism for Carbon Reduction, Pollution Reduction, Green Expansion and Growth

We focused on

- analyzing China's power system and its ongoing low-carbon transition, and
- exploring the electrification of China's industrial heating.

We found

- A high percentage of carbon-free electricity in the energy mix delivers emissions reduction and decarbonization benefits while maintaining a highly reliable and resilient grid.
- Energy storage and transmissions between regions are critical for a smooth transition to a clean grid.
- Industrial heat pumps are the most efficient and cost-effective way to provide low-temperature (160°C and below) heating for many industries.
- Thermal batteries can provide heat at temperatures up to 1,700°C, operate on or off the grid, and provide grid balancing benefits.



We recommend



set clear targets for the power sector:

- solar and wind installations to reach 2,400 gigawatts by 2030 and 6,000 gigawatts by 2040.
- reduce the carbon emission intensity of the power grid by 25% by 2030 and 65% by 2040 compared to 2020.



improve the use of industrial heat pumps:

- establish pilot projects in selected cities or industrial parks to develop industrial heat pump efficiency.
- set gradually stricter energy efficiency and carbon emission standards for industries to promote the use of high-efficiency equipment.



tighten China's air quality standards to improve decarbonization in key sectors and promote the low-carbon transition in the power sector,



support research, development, and market supply of thermal batteries.

Digitalization and Green Technologies for Sustainable Development:

Digital-green dual transformation and sustainable development of cities

We focused on

- exploring theories and mechanisms that drive the dual digital and green transformation with the aim to promote urban sustainable development, and
- analyzing cutting-edge practices and experiences of the digital and green transformation in cities across the world.

We found

- Sustainable urban development is based on building digital capabilities and using it for coordinating economic, social, and ecological development.
- Digital and green technological innovation is the fundamental means for achieving sustainable urban development and should be allied with robust public policy for full impact.
- It's crucial for policy-makers to develop the digital and green transformation within urban industry development.
- A more realistic smart city index system for promoting sustainable urban development is needed.

We recommend



use the concept Sustainable Smart City to lead China's digital and green urban development,



develop innovative urban technologies and solutions to further integrate the digital and green transformation processes, and



promote a people-centred digital and green transformation, including incorporating sustainability considerations into digital solutions, improving data governance, and establish a comprehensive digital privacy and security framework,



mainstream digital and sustainable city planning to coordinate low-carbon economic development, biodiversity conservation, efficient transportation, and green buildings.

2024 CCICED Special Policy Study Infographics Inputs

We focused on

- What challenges does China's capital market face in supporting green technology innovation, and how can it better play the role?
- In the new phase of green finance, what kind of environment should the government create to more effectively foster and promote breakthrough innovations in green technology?



We found

- The success of China's green transition is attributed to the role of economies of scale and market competition in continuously reducing the costs of new energy. However, relying solely on the expansion of production capacity based on existing mature technologies to drive green transition will face more challenges in the future. China's new focus for green transition require breakthrough technology innovations.
- Addressing the dual externalities of green transition requires green finance to have both policy and technology finance attributes. To support green technology innovation, the attribute of technology finance is enhanced.
- The capital market should play a greater role in the new phase of green finance. Its unique advantages in promoting breakthrough green technology innovations lie in its ecosystem effect and selection effect.
- Currently, China's capital market faces challenges in supporting green innovation, such as difficulties in fundraising, increasingly singular and low-risk investment preferences, and inadequately exit mechanisms, which are not conducive to fostering breakthrough technological innovation.

We recommend



Adopt a "quantitative carbon reduction performance" model instead of a "procurement list" model in the bidding mechanism for green procurement.



Accelerate the expansion of the carbon market and establishment of the carbon quota auction mechanism to reduce the green premium for innovative technologies.



Explore feasible paths for bank funds to support the development of the equity market in raising capital, and guide long-term capital such as funds from wealthy individuals and pension funds into the market.



Support the green technology innovation ecosystem, such as supporting green technology incubation or acceleration projects, cultivating a team of green technology managers, and improving the green technology innovation service system.



Establish a green performance auction fund connected to the financial market.



Optimize the assessment methods for industry guidance funds in fund management, establish green venture capital plans, and value the positive role of foreign venture capital and corporate venture capitals (CVCs).



Create a favorable environment for green sector companies to go public and facilitate diversified means such as M&A.

Biodiversity Conservation and Implementation of the Kunming-Montreal Global Biodiversity Framework

We focused on

- analyzing the effectiveness of the Global Biodiversity Framework's 30x30 goal (Target 3), which targets the protection of 30% of the world's land and sea through protected areas and other effective area-based conservation measures,
- exploring the sustainable use and management of agricultural biodiversity and regenerative agriculture (Targets 7 and 10), and
- exploring financing and resource mobilization for biodiversity conservation and sustainable use (Targets 18-19).

We found

- Biodiversity loss hasn't been reversed globally and pressure on biodiversity is intensifying—to meet the 30 x 30 target we need to expand protected areas and area-based conservation using tools like China's ecological conservation red line and increase investment in biodiversity
- Sustainable and regenerative agricultural approaches are key to reaching biodiversity conservation, ecological resilience, climate, and food security goals. Opportunities exist to reduce the negative impacts of agriculture without sacrificing productivity.
- A significant increase in financial resources from domestic, international, public, and private sectors is critical for biodiversity conservation and restoration efforts. China can play a key role in developing mechanisms to fill the funding gap.

We recommend



promote a variety of area-based conservation models around the world to deliver on the 30x30 target, building on existing protected and conserved areas and on China's ecological conservation red lines.



accelerate the development of a new, more sustainable approach to food production in China and internationally, including integrating agricultural ecological functions and biodiversity health as a basis for food security.



further strengthen the effectiveness of China's own protected and conserved areas and promote the conservation of key ecosystems and species.



scale up China's domestic financing for biodiversity conservation and restoration and promote the wider implementation of market incentives for conservation contributions, as well as the reform of harmful incentives.

Sustainable Oceans Management Under the Vision of Carbon Neutrality

We focused on

- providing a framework for establishing sustainability-oriented ocean economic accounting,
- providing a **blue finance framework** to better facilitate resources toward a Sustainable Blue Economy, and
- assessing how the marine industry can achieve higher sustainability through technological innovation and a stronger focus on China's dual carbon strategy.

We found

- The value of the blue economy has received increasing international recognition and policy attention. Now **strategic focus** is required from Chinese policy-makers to accelerate its domestic development.
- China's **ocean energy industry is growing quickly**. Now is the ideal time to transit toward a sustainable industry design contributing to domestic and international sustainability goals.
- Effective policies and measures are needed to help informed decision making on whether deep-sea mining can be pursued within the framework of a Sustainable Blue Economy.
- Offshore aquaculture—addressing the critical need for high-quality aquatic food while protecting the coastal ecosystem—is an opportunity for China to take a leading role in implementing robust industry design and governance policies.

We recommend



move ocean industries toward a comprehensive Sustainable Blue Economy through:

developing national strategies for key ocean industries, such as ocean renewable energy, deep-sea mining, and offshore aquaculture, supported by robust governance policies,

mobilizing necessary government financial instruments aligned with market principles, such as insurance, ecological subsidies, and incentives for industry transformation.

incorporating the needs of coastal communities, the marine and coastal ecosystems, and stakeholders, including women and other marginalized groups, across the entire industry value chain in these strategies, and



include Sustainable Blue Economy within top-level policy framing with clear definitions and principles and incorporate it into the next 5-year plan, to drive an ambitious low-carbon transformation.

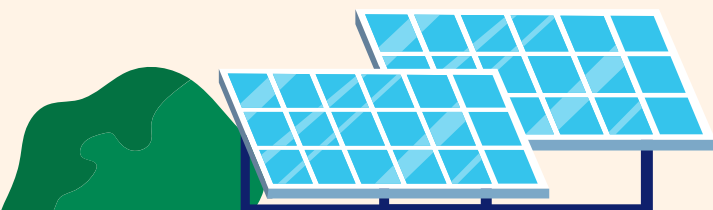
Green Opening-Up and South-South Cooperation

We focused on

- identifying new ways to promote green South-South cooperation, and
- evaluating the key challenges and opportunities for cooperation between China and the Association of Southeast Asian Nations (ASEAN) as well as China-Africa cooperation especially on renewable energy, green industrialization, and critical minerals.

We found

- China's investment in the Global South has a significant impact on local development efforts.
- Barriers to decarbonization in Southeast Asia include regional coordination, technological and capital disconnects, policy instability, and low priority from decision-makers. USD 1,070 billion investment is necessary to accelerate the sustainable transformation of major emission industries in ASEAN countries. Renewable energy development should constitute at least 59-77% of the overall investment.
- The African Leaders Nairobi Declaration on Climate Change set an ambitious target to increase Africa's renewable generation capacity from 56 gigawatt (GW) in 2022 to at least 300 GW by 2030. Limited financial resources and underinvestment in the energy sector have hindered the progress of renewable energy development across Africa.



We recommend



develop a roadmap for promoting green opening-up and South-South cooperation, to enhance short-term coordination, medium-term development policies and strategies, and a coherent cross-government management of green South-South cooperation in the long term.



unlock the potential of China-Africa renewable energy cooperation through China-Africa high-level dialogues on renewable energy, exploring cooperation on sustainable trade, green industrialization, and critical minerals, and expanding financing models for efficient climate investment.



enhance China-ASEAN renewable energy cooperation through establishing a comprehensive strategic partnership for green energy development, accelerating industrial decarbonization measures, guiding sustainable investment, and reducing financial risk in renewable energy projects.



leverage the opportunities of China-Brazil cooperation through establishing a stakeholder task force within the "China-Brazil High-Level Coordination and Cooperation Commission" and exploring opportunities across pastureland recovery, agricultural commodity supply chains, renewable energy, strategic minerals, green investment, and local low-carbon industrial systems.

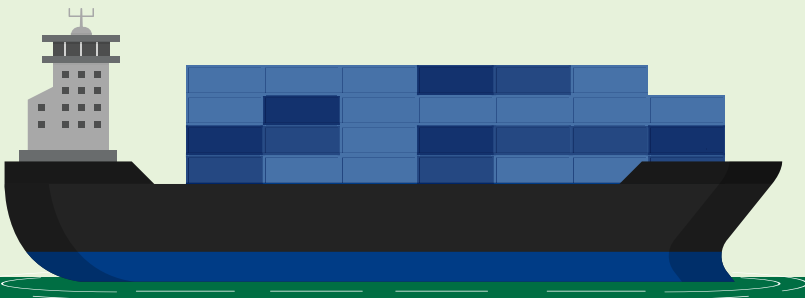
Sustainable Trade and Supply Chains

We focused on

- analyzing China's role in the global low-carbon technologies (LCTs) market and their impact on sustainable development, and
- investigating political economic factors that determine countries' bilateral LCT trade with China.

We found

- China has become a global export leader on LCT products, transforming from a net importer to a net exporter over the past 3 decades.
- The adoption of LCTs through trade with China has significantly reduced carbon emissions in importing countries.
- Economic development, trade openness, and political stability are key for facilitating the adoption of LCTs.
- Human capital and foreign direct investment are crucial to enhance the environmental benefits of LCT imports from China.



We recommend



invest in research and development for renewable energy technologies to drive innovation and global competitiveness,



encourage outward foreign direct investment in renewable energy and LCTs to promote global cooperation and balance trade, and



maintain stable bilateral exchange rates to foster steady trade and investment relationships with key LCT trading partners,



pursue further trade liberalization and efforts to interconnect global supply chains.