AN INTEGRATED STRATEGY TO ASSIST CHINA'S CITIES IN ACHIEVING AN EARLY CARBON EMISSIONS PEAK[1]

SUMMARY

Cities are at the forefront of efforts to fulfill China's climate change pledges. Numerous energy policies have been implemented to tackle local environmental issues. However, if China is to embark on a path of deep de-carbonization, it needs a set of enhanced policies and practices to address the global climate change challenge. A growing body of evidence shows that the ten actions outlined below can help cities achieve lower emissions together with sustainable economic growth, better air quality, and more livable communities.

Cities are vastly different and there is no single cure-all solution. Practices in climate change pioneer cities suggest that an evidence-based policymaking approach is critical to ensure that mayors identify, develop, and implement the strongest possible policy packages that are cost-effective and fit into the local context.

Stakeholders at all levels can play a significant role by pursuing efforts in several priority areas. Most importantly, cities need to develop a city-level green growth blueprint, using state-of-the-art analytical tools to develop a thorough technical analysis of mitigation potential and an economic analysis of the impact on jobs, GDP, and investment.

WHY CHINESE CITIES?

China's overall green growth development plans are based on the pledge to peak carbon emissions by 2030 or earlier while maintaining economic development targets, which include doubling GDP and per capita income by 2020 compared to 2005 levels. China's cities are at the forefront of efforts to achieve these national green growth goals. Home to over half of the nation's population, China's cities are also centers of industry, the biggest source of carbon emissions. Urbanization will bring around 300 million more people to live in cities in China by 2030 and living standards are expected to increase dramatically as income grows.

Unlike most cities around the world, energy consumption and the carbon dioxide (CO_2) emissions of Chinese cities are still dominated by urban industry. The best estimates for 2015 indicate that industry accounts for 59% of urban CO_2 emissions, followed by the transportation sector at 17%, commercial buildings at 13%, and residential buildings at 12%. These emissions result from a final urban energy mix of 45% coal and coke, followed by 25% oil, 20% electricity, and 6% natural gas. Electricity is highly carbon-intensive, with 75% of electricity generated from coal. In addition, China's cities are well positioned to play a leading role in climate change mitigation also because most of the infrastructure investment decisions in China are made at the city level.

ENHANCED POLICIES & PRACTICES DRIVING EARLY PEAKING OF CO_2 EMISSIONS

Evidence suggests that the following set of enhanced policies and practices can help cities transition toward a deep de-carbonization development path, sustaining economic growth with lower emissions, better air quality, and more livable communities.

These recommendations are based on reviewing city level climate change actions around the world. They are proven effective practices that could be introduced – and customized to the local context - to all cities in China. An overview of China's Alliance of Pioneer Peaking Cities (APPC) actions indicates that the stringency of city-level policies in China varies significantly. Cities can benefit by simply increasing their ambition level. There is also an important opportunity for China's cities to improve through peer learning domestically and internationally.

1. LEGALLY BINDING GREEN GROWTH BLUE PRINT TO 2030

A city-level long-term Green Growth Blue Print provides the vision to address climate change while maintain healthy economic growth. This vision is essential to define development goals and energy use scenarios.

A strong and ambitious green growth blueprint should include:

- A strong legal basis either as local legislation or an executive order approved by municipal authorities.
- A thorough analysis of economic impacts, including

investment, jobs, GDP growth, as well as most impacted industries.
- An absolute carbon emissions mitigation goal, a carbon emissions peak goal before 2025, and ideally a per capita emission goal by 2030.
- Sectoral targets in energy efficiency improvement and renewable energy development.
- Integration of goals with urbanization and economic growth targets.

2. ENERGY SYSTEM TRANSITION PLAN WITH A STRONG COAL CAP

Transitioning to a clean energy mix is the core mission of addressing climate change in China and globally. For a city in China, it is important that an energy system transition plan include:

- A city-level energy transition action plan to 2030, integrating feasible clean energy supply potential and energy efficiency improvement.
- A timeline and investment plans to reduce coal use before 2020 and to refrain from building new coal-fired power plants.
- A non-fossil fuel energy share goal higher than the national level target.
- Prioritization of a small number of key renewable energy technologies that fit into the local context.
- Robust economic incentives to promote renewable energy development and grid access.

3. AMBITIOUS INDUSTRIAL ENERGY EFFICIENCY PROGRAM ADOPTING MOST ADVANCED EFFICIENCY STANDARDS

Industry is the dominant energy-consuming sector in most of China's cities. An ambitious energy efficiency program should be able to help not only improve economy-wide energy efficiency, but also to help the green transition of industry to cleaner industries. Such a plan should include:

- GDP value-added energy efficiency targets that are higher than national requirements.
- Promotion of industrial structure change favoring service industries.
- Adoption of strong energy efficiency standards and labeling systems.
- Roadmaps of key programs, policies, and technologies to capture the largest energy efficiency potentials.
- State-of-the-art energy benchmarking and energy management systems.
- Energy management training to build capacity to support industrial energy savings.
- An institutional framework and economic incentives to enable implementation of an ambitious industrial energy efficiency program.

4. SMART URBAN DESIGN AND LOW CARBON INFRASTRUCTURE DEVELOPMENT PLANS

An urbanization plan, if not developed correctly, will lock a city into a high carbon growth pathway characterized by car-oriented transportation modes, high-energy consuming buildings, and resource-demanding lifestyles. Various programs have been implemented to improve smart urban development, which promote:

- Non-motorized transit options, including walking and biking
- Walk-able communities
- Transit oriented development
- Mixed use neighborhoods
- City development boundaries
- A dense network of streets and paths

5. CLEAN TRANSPORTATION PROGRAM PROMOTING LOW CARBON VEHICLES AND NON-MOTORIZED TRANSIT MODELS

Energy use of the transportation sector is expected to rise dramatically in China. Measures to reduce emissions should adopt the most stringent policies for improving vehicle efficiency and curbing motorized transit. A sound city clean transportation plan should introduce the following policies:

- Set a goal for the share of public transit to be higher than 60%.
- Introduce incentives to purchase compact vehicles.
- Invest in an electric vehicles charging system.
- Adopt economic tools and regulations to limit driving, parking, and road use.
- Promote car-sharing programs.
- Develop green fleet programs.

6. BUILDING ENERGY EFFICIENCY PROGRAM ADOPTING MOST STRINGENT BUILDING CODES AND IMPROVING IMPLEMENTATION

A strong buildings energy efficiency program helps cities to improve living standards while maintaining the current energy use level in China. Addressing carbon emissions from the buildings sector should focus on implementing the best building energy efficiency practices, by:

- Adopting the most stringent building codes, such as those in Beijing and Shenzhen.
- Introducing building energy efficiency retrofit programs.
- Supporting robust energy efficiency implementation mechanisms
- Establishing a transparent energy use data system.
- Adopting market entry requirements only for the most efficient appliances.

In addition to sectoral policies, the following four programs are also fundamental for cities to address climate change challenges.

7. A GREEN FINANCING PLATFORM USING A PUBLIC PRIVATE PARTNERSHIP (PPP) MODEL

8. A MONITORING, REPORTING, AND VERIFICATION (MRV) SYSTEM BASED ON A STATE-OF-THE-ART ENERGY AND CARBON EMISSION DATA PLATFORM

9. A PUBLIC CAMPAIGN ADVOCATING A LOW CARBON LIFESTYLE AND CONSUMPTION BEHAVIOR

10. A SERIES OF EXPERIMENTS PILOTING CLOSE TO ZERO EMISSION PROJECTS TO CONTINUE TO INCREASE THE AMBITION OF POLICYMAKERS.

AN EVIDENCE-BASED APPROACH TO EARLY PEAKING CITY PLANNING

Cities need to establish an approach to identify and prioritize the most cost effective policies and actions that are relevant to the local context. International experience shows cities commonly start with establishment of an emissions inventory and then benchmark themselves against peer cities. They conduct thorough and in-depth technical assessments through scenario analysis in order to identify energy savings and CO_2 emissions reduction potentials, and then set targets, evaluate what policies or programs can help achieve the targets, and then prioritize the policies or develop roadmaps for policy implementation. This evidence-based approach provide strong basis for developing the strongest possible policies and enables continuous improvement of policy stringency and sound implementation with a robust MRV system. Mayors can follow such an approach to develop, implement, and evaluate the actions that the city must take to move toward a green transition.

- Establish a climate change advisory committee including experts in economics, environment, and energy policies
- Establish a cross-agency climate change task force
- Develop a city-level GHG inventory and data platform
- Conduct an integrated economic, energy, and emission scenarios analysis to 2050
- Introduce and legalize a city climate change action plan and an information disclosure system
- Establish effective implementation mechanisms based on international best practices

INTERVENTION STRATEGIES TO ASSIST CITIES ACHIEVE A CARBON EMISSIONS PEAK

Various organizations, government agencies, NGOs, and think tanks have undertaken efforts related to low carbon cities. Most of these efforts have focused on sector-level projects, including sector-specific research or demonstrations. In reviewing these activities, we found that there are gaps related to: (1) building vision

Annex: An Overview of City Level Engagement from International Organizations

	Peaking Planning	Economic Development	Urban Zoning	GHG Inventory	Renewable Energy	Industrial Energy Efficiency	Building	Transportation	Financing	Forestation
ADB[2]										
WB										
EFC										
GIZ										
ICF										
ISC										
ITDP										
IVL										
NRDC										
PI										
ULI										
UNDP										
US Embassy										
Danish Embassy										
LBNL/CEG										
TNC										
UN Habitat										
WRI										

and increased ambition, (2) adopting the most stringent energy performance standards in all sectors, (3) designing a smart city infrastructure system in favor of a low carbon lifestyle, (4) introducing economic tools to leverage policy implementation, (5) prioritizing an effective MRV mechanism to track and scale up best practices, and (6) forming a green financing platform supporting low or zero emission projects.

Stakeholders at all levels can play a significant role by pursuing efforts in several priority areas. Most importantly, cities need to develop a city-level green growth blueprint, using state-of-the-art analytical tools to develop a thorough technical analysis of mitigation potential and an economic analysis of the impact on jobs, GDP, and investment.

ENDNOTE

[1] Prepared by Innovative Green Development Program (iGDP) China Energy Group, Lawrence Berkeley National Laboratory, and Energy Foundation China, Sustainable Energy Program

[2]
ABD Asian Development Bank
WB World Bank
EFC Energy Foundation China
GIZ Deutsche Gesellschaft Für Internationale Zusammenarbeit
ICF ICF China
ISC Institute for Sustainable Communities
ITDP Institute for Transportation & Development Policy
IVL IVL Swedish Environmental Research Institute
NRDC The Natural Resources Defense Council
PI Paulson Institute
ULI Urban Land Institute
UNDP United Nations Development Programme
US Embassy Embassy of the United States
Danish Embassy The Royal Danish Embassy
LBNL/CEG Lawrence Berkeley National Laboratory/China Energy Group
TNC The Nature Conservancy
UN Habitat United Nations Human Settlements Programme
WRI World Resource Institute

PHOTO

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