

Subnational Decarbonization and Sustainable Urbanization in China

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From LOGIC and EPS

01

Overview of Climate and Energy Policy Framework in China

Climate change has posed more and more tangible impact on urban daily life

- **Rising public awareness to climate change in urban areas**
 - More natural disasters in urban areas
 - Flood
 - Extreme heat
 - Wild fires in mountainous regions, etc.
- **Consensus: decarbonization is one of the priorities in sustainable urbanization**

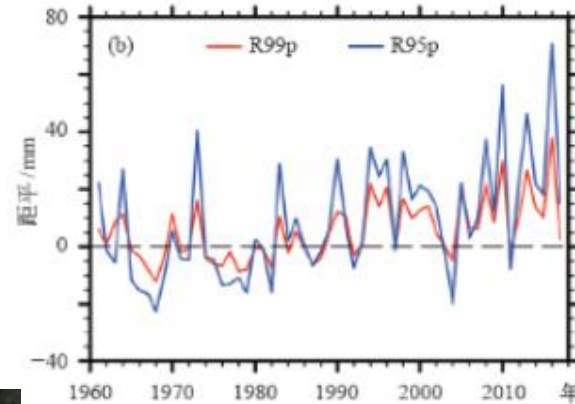


Wild fire in Chongqing, 2023

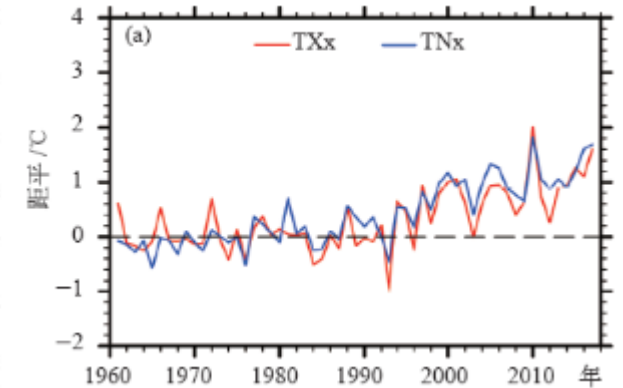


Extreme precipitation in Zhengzhou, 2021

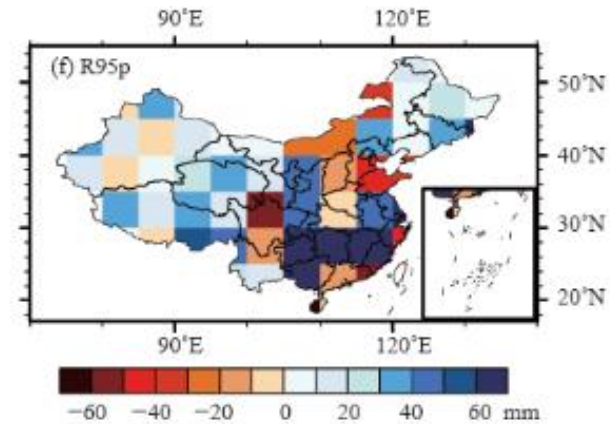
Extreme precipitation trends



Max and Min temperature trends



Extreme precipitation spatial distribution



Figures are from YIN Hong, SUN Ying. Characteristics of extreme temperature and precipitation in China in 2017 based on ETCCDI indices. *Advances in Climate Change Research*[J], 2019, 15(4): 363-373 doi:10.12006/j.issn.1673-1719.2018.164

Figure sources: WeChat articles, 冯丁伊登, 上游新闻

Environment and Climate Policy Framework

for nation and subnational regions

DRIVERS OF CHINA'S CLIMATE POLICY

Aligning with the Development Strategy

ECONOMIC GROWTH

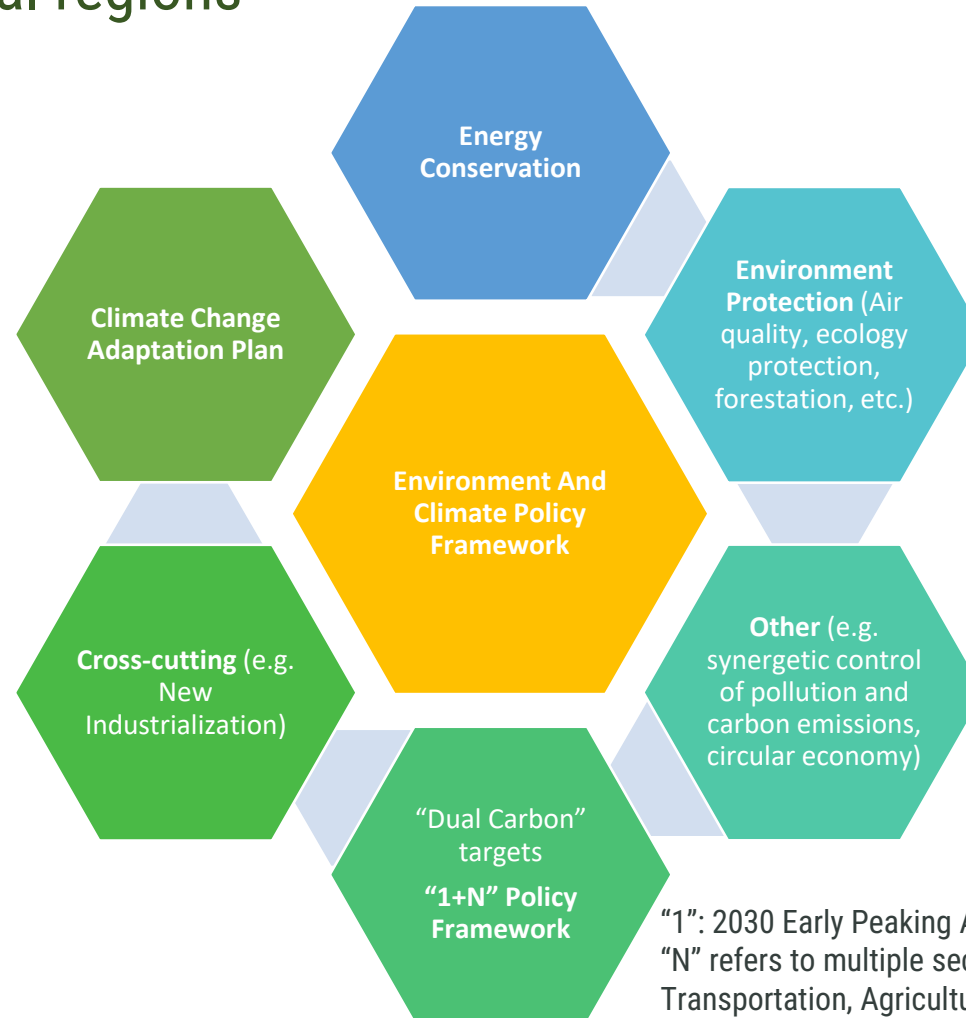
Resources-intensive growth to High-quality growth
New growth engine: clean technologies

ECO-CIVILIZATION

Air Quality Improvement
Conservation
Forestation

GLOBAL LEADERSHIP

Geopolitical Competition
Common Ground for multilateral/bilateral dialogues



Outcomes from climate and environment policy actions, on top of **slowed-down climate change**, are **aligned with the goal of sustainability and resilience** of urbanization:

- **Sustainable environment:** Less fossil fuel consumption, less pollutions. Forestation and ecological protection, etc.
- **Sustainable economy:** Development of emerging industries, transition away from carbon intensive industries, etc.

"1": 2030 Early Peaking Action Plan of the State Council

"N" refers to multiple sectoral plans in the area of Energy, Industry, Urbanization, Transportation, Agriculture; supported by corresponding plans in technology, finance, carbon sink, etc.

02

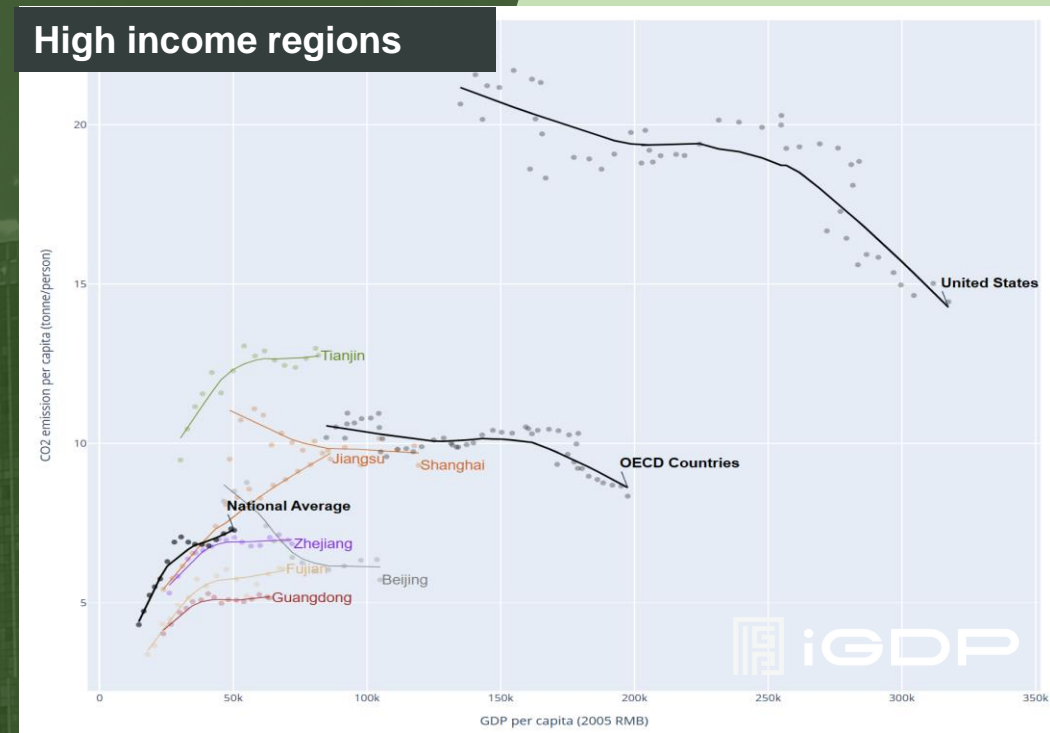
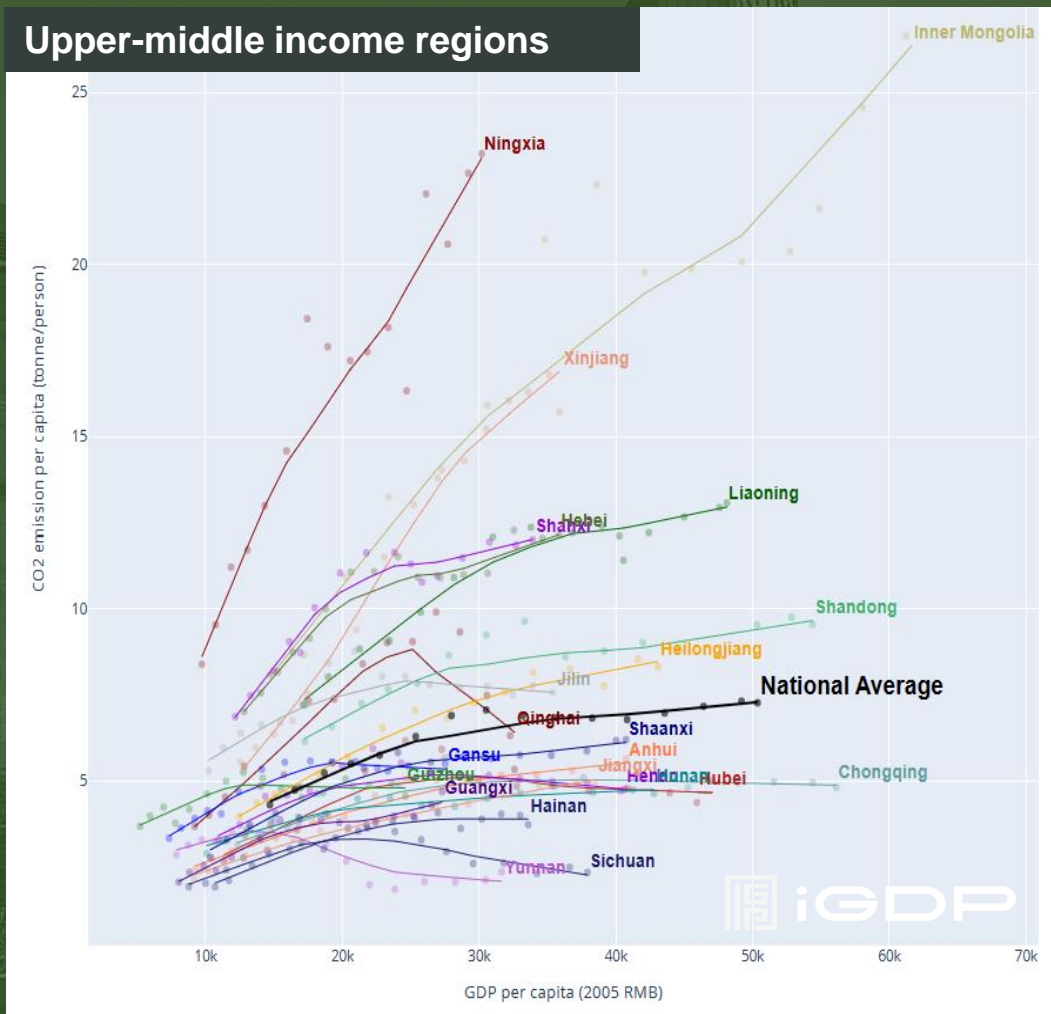
Findings

Scale and Diversity

Emission level and transition pathways are very diverse.

Most of rich regions' emission have seen decoupling from economic growth.

CO₂ emission per capita vs. GDP per capita (2005-2021)



The provincial regions in this brief refer to provincial administrative regions (PAR), including 23 provinces, 4 municipalities, 5 autonomous regions and 2 special administrative regions. The data collection in this report does not include Tibet, Taiwan, Hong Kong and Macao, though they are also included in the national average.

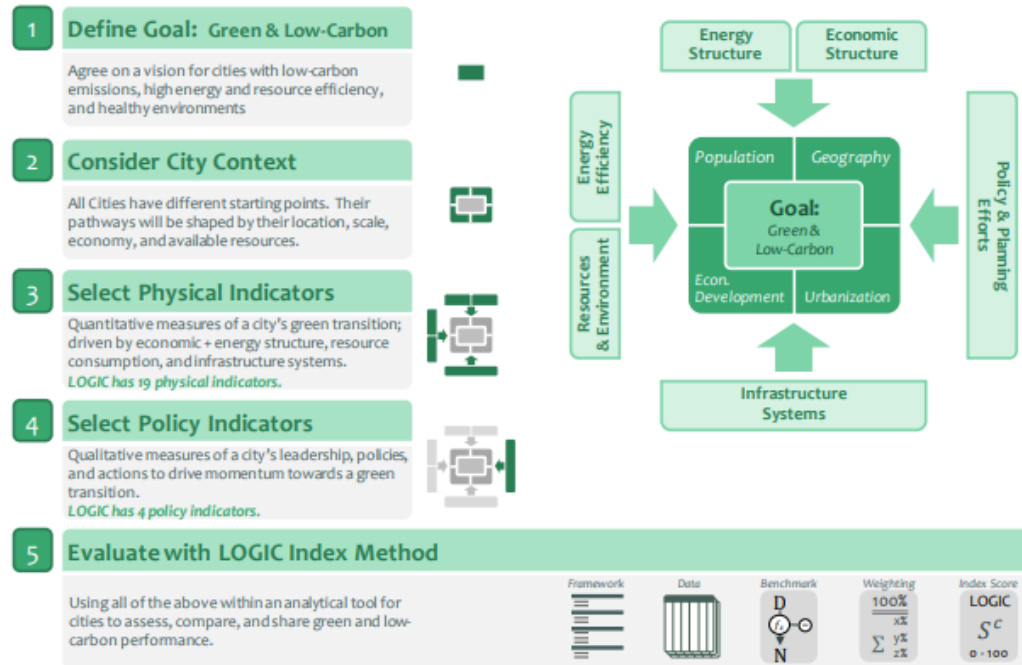
*Energy-related CO₂ emission in 2020 calculated by iGDP, GDP from National Bureau of Statistics, U.S. and OECD data from World Bank

Income groups are based on the World Bank's classifications in 2020

Tracking Low-Carbon Transition Progress in Subnational Regions

LOGIC (Low-carbon & Green Index for Cities) Framework

Figure 7 – The Framework for the LOGIC Tool and Analysis



LOGIC Indicators System (2024)

19 qualitative indicators, 4 qualitative indicators
10+ monitoring indicators

Carbon productivity - 2 indicators

Carbon Emissions - 11 indicators

Energy

Industry

Transportation

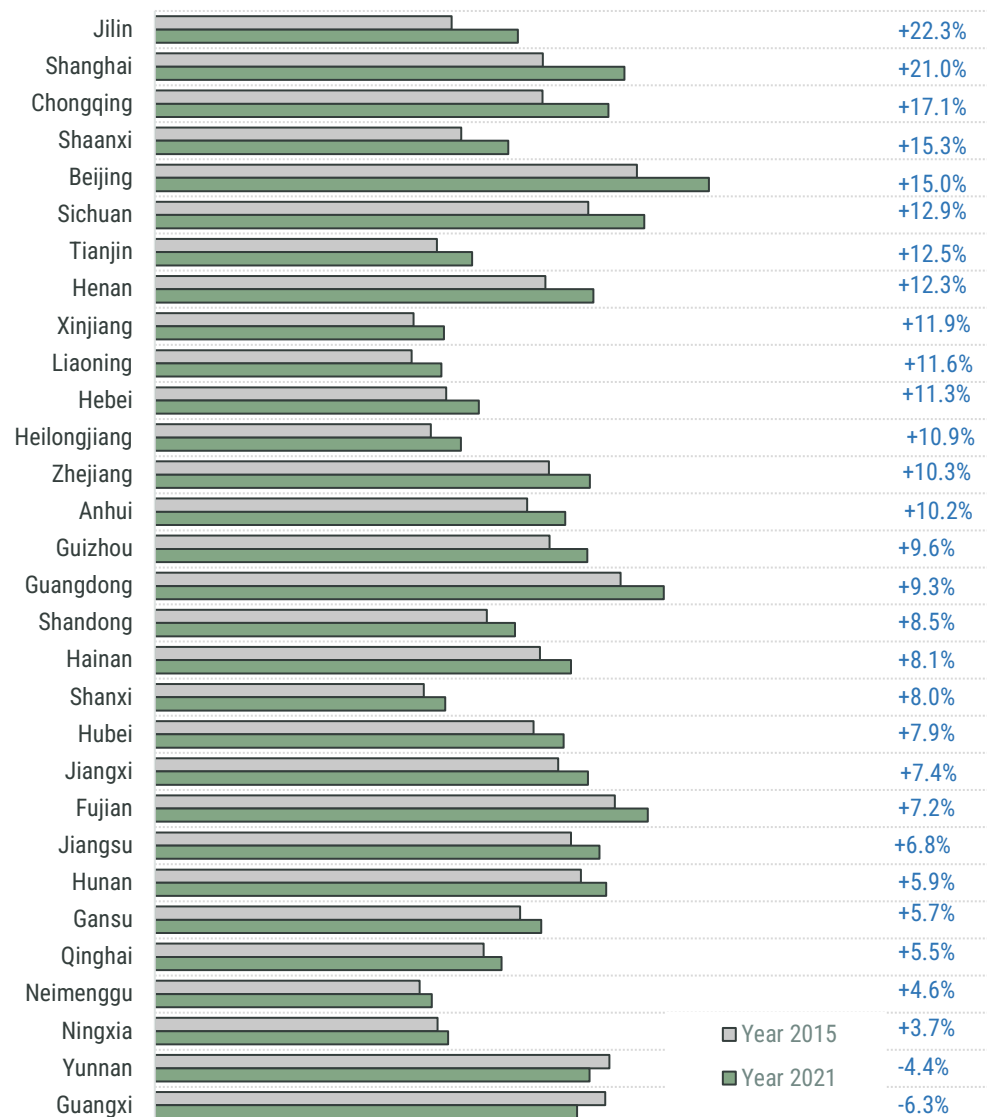
Buildings

Environment & Land use - 6 indicators

Social Awareness - 4 indicators

Environment and Climate Policies Accelerated Low-Carbon Transition Progress based on LOGIC score

LOGIC Score (2015 vs 2021) by region



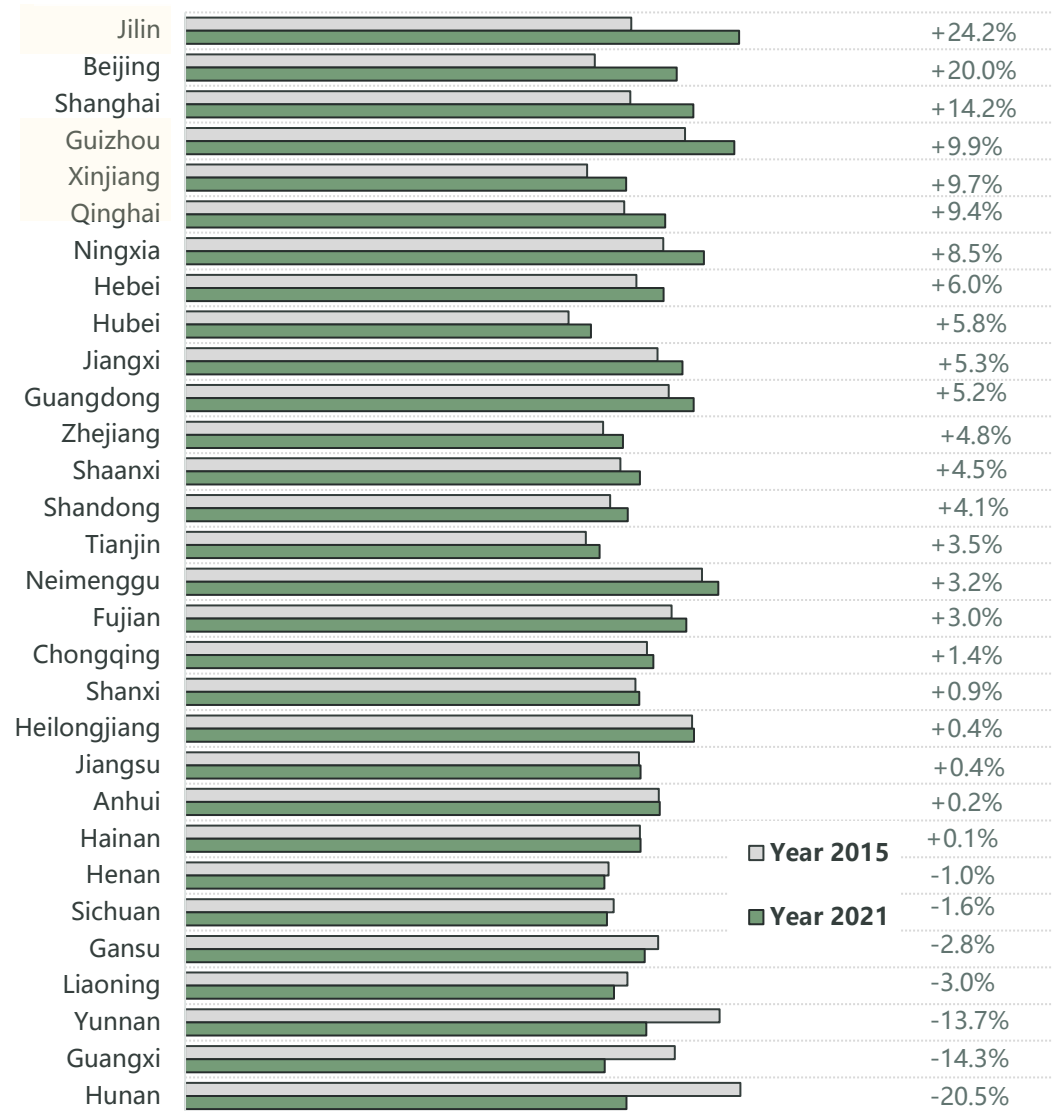
Progress: Between 2015 and 2021, the average score of the Provincial LOGIC Index increased 9.2% from 21.7 to 23.7.

Significant Improvement in Environment and Land Use

Fast-developing or catching-up regions.

ALL regions can make evident progress with appropriate measures, despite of economic development status, energy structure etc.

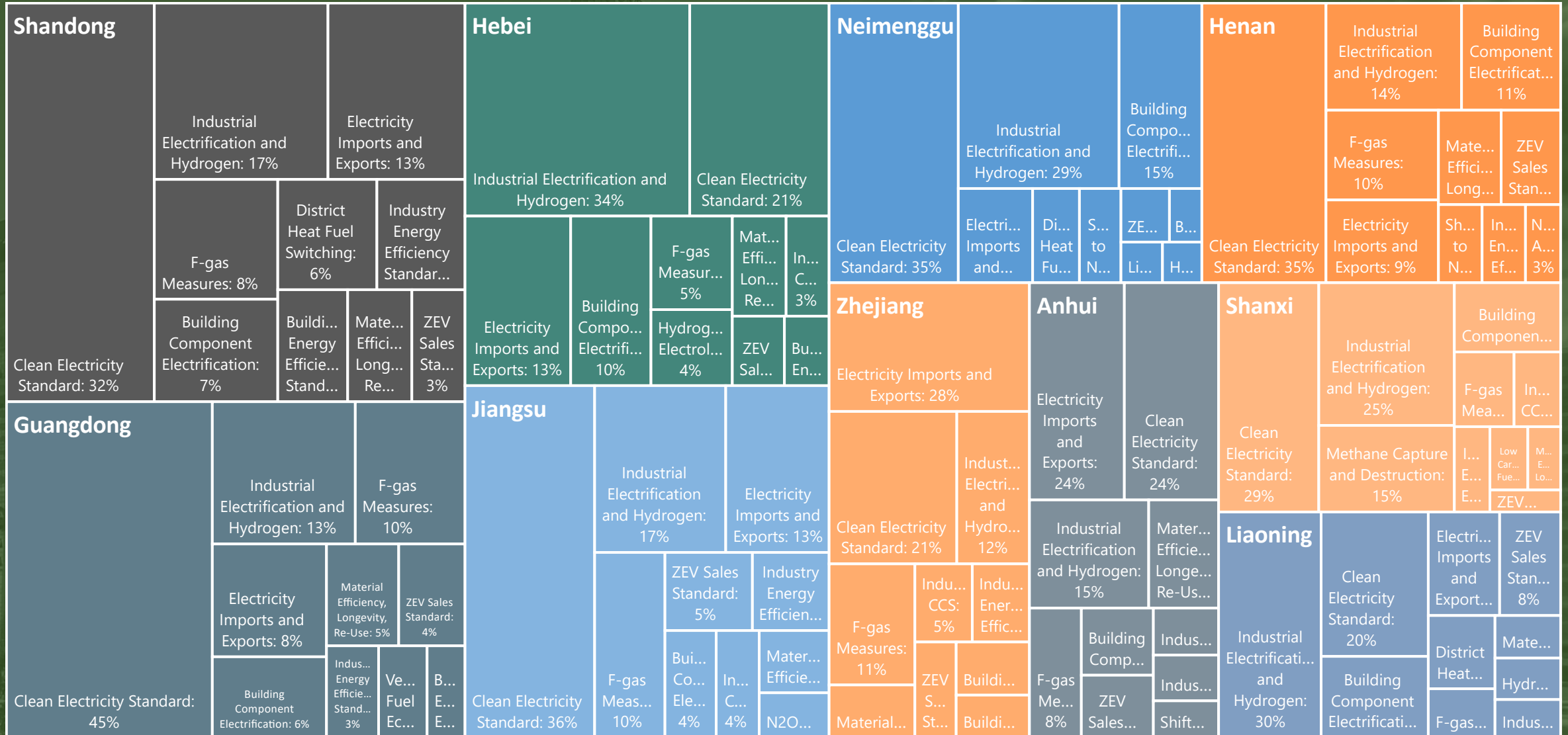
Subsector LOGIC Score: Environment and Land Use (2015 vs 2021) by region



Most Effective Policies Using Energy Policy Simulator (EPS)

Top 10 Provinces by GHG abatement (2021-2060)

Captured in local policies and measures.



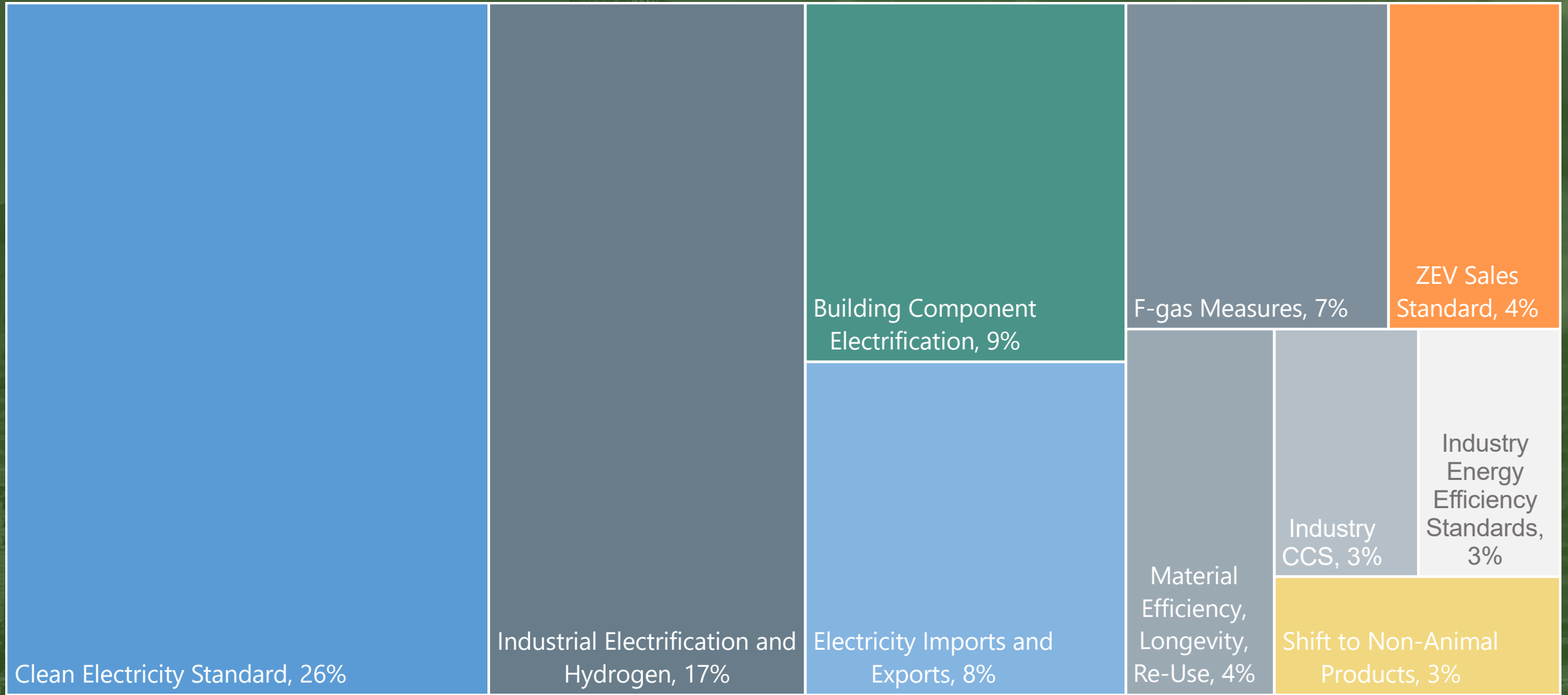
Note: Sorted using cumulative GHG emission reduction to identify top 10 policies in each of the top 10 provinces (which contribute to 28% of the total abatement).

Preliminary results, please do not cite without author's permission.

Top 10 Policies by GHG Abatement (2026-2060)

(Dual Carbon Scenario vs 2020 Frozen Policy)

In line with urbanization sustainability efforts.



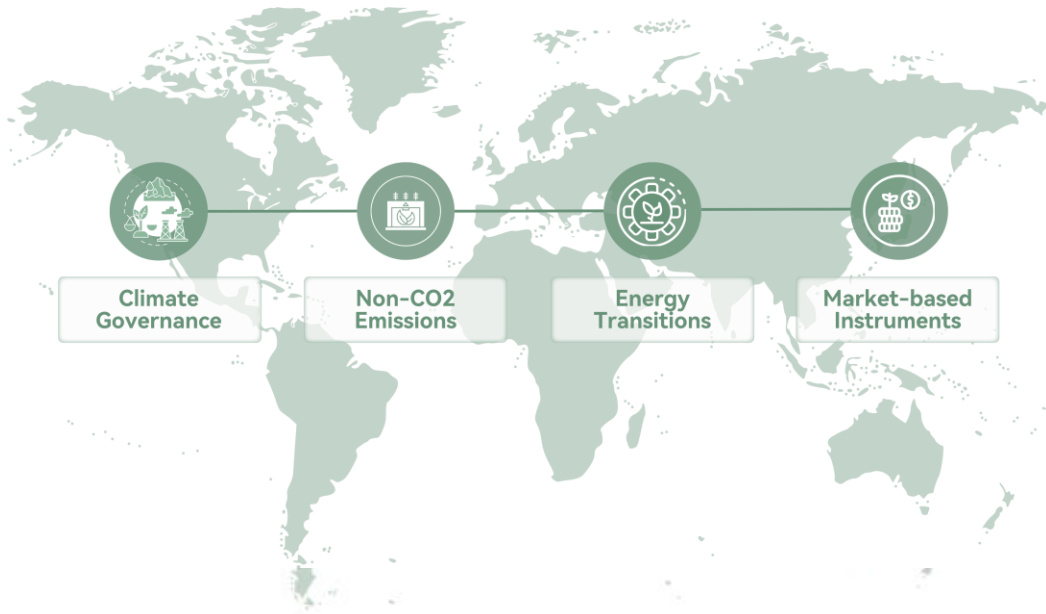
Note: Sorted using cumulative GHG emission reduction to identify top 10 policies (which contribute to 85% of the total abatement). Preliminary results, please do not cite without author's permission.

Institute for Global Decarbonization Progress



The Institute for Global Decarbonization Progress (iGDP) is a non-profit think tank focusing on green and low-carbon development with offices in China and Europe. Established in Beijing in 2014, iGDP is dedicated to supporting China's green and low-carbon practices, contributing to the global effort to address climate change, and providing decision-makers, investors and local communities with forward-thinking solutions.

Pillars



Products and Platforms

The products and platforms section displays a grid of screenshots for various tools:

- Subnational EPS Models**: 中国分省气候政策模型 (China Provincial Climate Policy Model) - A grid of small line charts for various provinces.
- EPS China Model**: 中国能源政策评估模型 (China Energy Policy Evaluation Model) - A line chart showing energy policy simulation results.
- Non-CO2 and Agri-food**: 非二与农食 (Non-CO2 and Agri-food) - A bar chart showing trends in non-CO2 emissions and agri-food sectors.
- Carbon Neutrality Tracker**: 零碳录 (Zero Carbon Record) - A table with columns for tracking carbon neutrality progress.
- Regional Transition Index**: 地方绿色低碳评价指数 (Local Green and Low-carbon Evaluation Index) - A bar chart showing regional transition scores.
- Dialogue: Climate Catalyst Chats**: 好思汇 (Good Thoughts) - A logo for the Climate Catalyst Chats platform.





Thank you!