# iGDP

绿色创新发展中心
innovative Green Development Program

2015-2016 ANNUAL REPORT

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# MISSION

## Mission

The mission of innovative Green Development Program (iGDP) is to promote robust policy and practical actions to address the challenges facing green growth. We believe that real solutions to climate change must incorporate the economy, environment and energy, as well as innovations in policy and business models and strategies to encourage behavioral change. We create analytical tools, share professional knowledge, and facilitate multidisciplinary exchanges to foster integrated solutions for regions, cities and communities.

iGDP was launched by Energy Foundation China (EFC), which also provides funding and operational support. iGDP is the implementation organization of the Green Low-Carbon Development Think Tank Partnership (GDTP) and a committee member of the Green Finance Committee (GFC) of the China Society for Finance and Banking. It is also a member of the United Nations Economic and Social Cooperation for Asia Pacific (UNESCAP) North-East Asia Low Carbon City Platform (NEA-LCCP) expert-institution.

## Focus

iGDP is currently focused on the following areas:

- Clean Energy Policies
- Low-Carbon City Planning
- Energy System Analysis
- Carbon Emissions Trading
- Green Financing, Taxes and Investment

# ANNUAL REVIEW

**2** Books

**1** Research Tool

**4** Working Papers

**1** Research Report

26 Professional Meetings

4 Case Studies

127 Opinion Pieces

**September 2015**

- 8/9 — Forum: An Environmental Protection Tax [Beijing]
- 15/9 — The First US-China Climate-Smart/Low-Carbon City Summit: Break-out Session on Low Carbon Energy [Los Angels]
- 30/9 — Forum: Thoughts on Pilot Work in Low-Carbon Cities and Actions [Beijing]

**October 2015**

- 15/10 — Forum:Roadmap and Policies for Peaking China's Carbon Emissions [Beijing]
- 20/10 — iGDP Seminar: Energy Data Exchange Workshop [Beijing]

**November 2015**

- 3/11 — Forum: Policies and Practices in China's Low-Carbon Pilot Cities: Bring the Emissions Peak Forward [Beijing]
- 11/11 — iGDP Seminar: Review and Prospects for the International Climate Change Governance Process [Beijing]

**December 2015**

- 4/12 — COP 21: Side Event on Green and Low Carbon Economy [Paris]
- 5/12 — COP21: Side Event on Low Carbon City Development [Paris]

**January 2016**

- 26/1 — GDTP Annual Conference: Green Low-Carbon Development: Challenges and Tasks Following the Paris Agreement [Beijing]

**April 2016**

- 19/4 — International Seminar:Fossil Fuel Subsidies [Beijing]

**May 2016**

- 31/5 — Forum: Carbon Taxes in China's Future: Role and Feasibility [Beijing]

## June 2016

- **6/6** Workshop: U.S.-China Climate-Smart / Low-Carbon Cities Initiative [Beijing]
- **7/6** The Second U.S. China Climate Smart/ Low Carbon Cities Summit： Breakout Session on Low Carbon City Monitoring and Evaluation [Beijing]
- **13/6** Forum: Energy and Carbon Pricing Reform in China: Green Growth Policy [Beijing]
- **14/6** iGDP Seminar: Myths and Facts about the Clean Power Plan [Beijing]
- **19/6** International Low Carbon Forum： Sub Forum on Green Finance [Shenzhen]

## July 2016

- **7/7** Conference:Climate and Energy Policy Solutions for China [Beijing]

## August 2016

- **9/8** Forum: Power Industry Reform and Carbon Emissions Trading System [Beijing]

## October 2016

- **12/10** Workshop: Mapping China's Low-Carbon Policies in Cities: A Post-G20 and Pre-COP22 [Beijing]
- **19/10** Conference: Policies and Practices in China's Low-Carbon Pilot Cities: Bring the Emissions Peak Forward [Beijing]

## November 2016

- **16/11** COP22 : Side Event on Climate Solutions for Northeast Asian Cities： Technology, Finance and Legal Framework [Marrakech]
- **24/11** Workshop: City Carbon Dioxide Emission Peak Planning Method and Policy Selection Tool [Hangzhou]
- **30/11** Forum: Promotion of Urban Green Low-Carbon Transformation: Method and Tools [Beijing]

## January 2017

- **21-22/1** China Energy Research Association Energy System Engineering Committee 2017 Annual Meeting and Green & Low-Carbon Development Think Tank Partnership (GDTP) Annual Conference [Shenzhen]
- **22/1** Workshop:City Carbon Dioxide Emission Peak Planning Method and Policy Selection Tool [Shenzhen]

# Climate Change

On 12 December 2015, 198 countries signed up to the milestone Paris Agreement, which will come into force in 2020. Countries agreed that they should aim to keep global average temperature rises below 2˚C above preindustrial levels and to aim to limit it further to below 1.5˚C. China's document to the United Nations Framework Convention on Climate Change (UNFCCC), *Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions (INDCs)* outlined its pledge to peak carbon dioxide emissions by around 2030, and to raise the proportion of non-fossil fuels in the total energy mix to 20% by the same year. The Paris Agreement was activated on 4 November 2016. At COP22 in Marrakech, countries met to agree on an implementation plan.

iGDP studies the INDCs of major countries, sustainable energy development and China's green and low-carbon transformation. It also researches political, technical, economic and social approaches to peaking greenhouse gas emissions as well as developing analytical tools and promoting interdisciplinary exchanges.

Field Activities

## COP21&COP22

The 21st meeting of the United Nations Framework Convention on Climate Change (COP21) was held in Paris from 30 November to 12 December 2015. iGDP organized a side event called Green Economy on 4 December in the China Pavilion where Chinese and overseas specialists discussed China's economic development path under a global vision. A day later, iGDP organized another side event called Low-Carbon City Development at the same venue where Chinese policy makers at the city level and scholars shared their experiences on urban development and industrial parks.



The 22nd meeting of the United Nations Framework Convention on Climate Change (COP22) was held in Marrakech from 7 November to 18 November 2016. Sun Miao, an iGDP analyst attended the conference as an observer. At the side event, *Climate Solutions for Northeast Asian Cities: Technology, Finance and Legal Framework* held on 16 November,Miao delivered a speech and launched the iGDP Policy Mapping tool (wwcw.epm.igdp.cn).

Field Activities

## Policy Mapping

Policy Mapping is a database and interactive platform to track, synthesize and compare low-carbon development policies and actions across regions and cities in China. By identifying publicly available key policies and performance indicators on low-carbon development, Policy Mapping will promote best practices and learning by doing.

Advocacy

# iGDP Articles

## 2015

Seven Policy Trends Influenced by the Paris Agreement: an iGDP Analysis
2/12

James Hansen's Carbon Emissions Reduction is Really Carbon Pricing
3/12

You Follow the Climate Negotiation in the Meeting Room, While I Watch the Competition Between Cities Outside
4/12

China Must and Can Achieve Green Growth
5/12

Low-Carbon Development - The World is Watching China and China is Watching its Cities
6/12

What Should Business Contribute to Addressing Climate Change?
11/12

The Climate Fund -- the 'Money' Thing
15/12

Many a Little Makes a Mickle- Climate-Related Movements in Regions and Cities
16/12

## 2016

Independent Analysis of NAZCA Data Shows Lack of Pledges from Developing Countries
13/5

China will honor its Paris Agreement: iGDP View
4/11

[Focus on Marrakech] First Step is Interpreting the Paris Agreement
8/11

[Focus on Marrakech] Finding Hope from Disappointment
9/11

[Focus on Marrakech] Low-Carbon Asia: International Cooperation and Pioneering Cities
10/11

[Focus on Marrakech] Actions Speak Louder than Words: Tackling Climate Change with More Solutions than Challenges through U.S.-China Cooperation
11/11

[Focus on Marrakech] Side Event:Peaking China's Carbon Emissions: Facing the Challenges
15/11

[Focus on Marrakech] The Revolution Still Eludes Us, Let's Work Harder
24/11

# Low-Carbon Cities

China is experiencing large-scale and rapid urbanization. It is predicted that in the next 15 years, about 350 million people will move to urban areas. In order to reach sustainable development goals, urbanization should be transformed from its traditional model to a green low-carbon model, incorporating economic growth, low-carbon transportation, green buildings, green industry and green lifestyles.

China first launched low-carbon pilots in 2010. So far 79 cities, six provinces and two counties have become low-carbon pilots, giving city administrators and others rich experience in how to pursue low-carbon growth.The launch of the *Alliance of Peaking Pioneer Cities (APPC)* was announced at the First U.S.-China Climate Leader Summit in 2015. After the nine cities and two provinces in the Alliance set years for peaking their $CO_2$ emissions, many pilot cities put forward their own peaking targets and joined the APPC. Currently, 23 provinces and municipalities are APPC members.

iGDP is exploring cities' low-carbon development plans and their road maps and practices concerning peaking greenhouse gas emissions.iGDP's approach is to systematically combine these experiences - comparing policies and measures with results through different perspectives –to better understand approaches to low-carbon transformation. It also offers case study analyses to offer independent, clear, and comparable information to help cities achieve low-carbon plans.

Field products

## Series of Working Papers on Low-Carbon Development Policy

The city is at the heart of China’s socio-economic development and urban low-carbon development is a major pillar of China's overall low-carbon strategy. The National Development and Reform Commission began launching low-carbon pilots in provinces and cities in 2010. These pilots served as demonstrations and offered a ground breaking guiding role for the country’s low-carbon urban development. iGDP closely follows China's low-carbon development policy,including goals and systems, and has published a series of up-to-date working papers on this issue. Four working papers have been published so far.

- Series I: *Low-Carbon Cities in China: Alliance of Peaking Pioneer Cities (APPC) Action Factsheet* published in October 2015
- Series II: *Low-Carbon Cities in China: Alliance of Peaking Pioneer Cities (APPC) Action Factsheet* published in July 2016
- Series III:*Summary of the Experiences of Low-Carbon Pilots: Policies and Cases,* published in July 2016
- Series IV: *Suggestions on the Principles and Objective-Setting for Low-Carbon Pilots,* published in July 2016

## China City Green Low-Carbon Development Index

iGDP, Energy Foundation (China), Lawrence Berkeley National Laboratory(LBNL) China Energy Group launched the China City Green Low-Carbon Development Index to track green low-carbon development in China’s cities to explore future development models.

It is a multi-dimensional comprehensive index, which selects cities as samples, collects data, quantifies green low-carbon development policy implementation and actions, and tracks and compares cities’ green low-carbon development.

The aim of this Index is to better understand green and low-carbon development in China, to identify best practices, to promote exchanges and cooperation between cities, and to provide research support for future development. We will continue to publish reports using this Index to provide a reference for policy-making and implementation.

## Wuhan City Peak Plan

iGDP, as one of the core members of the Wuhan Greenhouse Gas Peaking Technical Support Team, analyzed carbon emissions from the city's major industries (including energy, transportation, construction and industry) during the first phase of the project. iGDP used this analysis to predict when Wuhan could peak its emissions using the LEAP model and by exploring the potentials for action by counties and industry. Finally, the team offered a proposal for a roadmap for Wuhan to peak its emissions. The second phase of this project will aim to ensure the implementation of the road map so that emissions can be peaked by the target year.

## Low-Carbon Pilots Assessment

iGDP participated in NDRC led national low-carbon pilots program assessment between March and May 2016.

## Case Studies on Low-Carbon Development Industry Practices

- *1.Tulufan New Energy Demonstration Zone – Executive Summary*
- *2.Biomass Energy in China - Taking Huangshan District of Anhui Province as an Example*
- *3.The Contribution Made by Carbon Trading to the Development of Urban Low-Carbon Development–An Analysis of Shenzhen's Carbon Trading Pilot*

## Workshops on Low-Carbon City Road Maps

This series of workshops was jointly organized by iGDP and GDTP. It focuses on capacity-building in low-carbon transformation policy design and implementation at the provincial and municipal levels. The project matches GDTP experts with the needs of low-carbon development in different regions. The workshops aim to provide a solid scientific basis for urban low-carbon transformation and to facilitate exchanges between regions, thus helping China peak emissions earlier.

Field Activities

## U.S.-China Climate-Smart/Low-Carbon Cities Summit

The First U.S.-China Climate-Smart/Low-Carbon Cities Summit was held in Los Angeles, from the 15 to 16 September 2016. Li Ang, an iGDP senior analyst, accompanied the Chinese delegation taking part in the summit.

The Second U.S.-China Climate-Smart/Low-Carbon Cities Summit was held in Beijing from 7 to 8 June 2016. iGDP held a breakout session, titled, *Low-Carbon City Monitoring and Evaluation* on 7June.

## Forum on Promoting Green and Low-Carbon Transformation of Cities: Methods and Tools

Energy Foundation (China), iGDP, Lawrence Berkeley National Laboratory, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) East Asia and North-East Asia Sub-regional Office, ICLEI - The Asia-Pacific Secretariat of the International Council for Sustainable Development organized a forum in Beijing on *Promoting Green and Low Carbon Transformation in Cities: Methods and Tools* on 30 November 2016. The forum brought together researchers working in green low-carbon research from Beijing, Anhui, Shanghai, Guangdong, Chongqing and Hebei among others.

## Workshop on City Peak Planning Method and Policy Selection Tool

iGDP, GDTP, the Zhejiang Center for Climate Change and Low-Carbon Development Cooperation held a seminar on City Peak Planning Method and Policy Selection Tool on 24 November 2016 at the Zhejiang Economic Information Center. Mrs. Hu Xiulian, a researcher at the Energy Research Institution and an iGDP senior advisor and Mr. Zhou Yong, Director of the Climate Change Research Center at the Shandong Academy of Sciences gave speeches on the Local Peak Road Map Method and the Options of Low-carbon Planning Policy.

Advocacy

## Media reports

21世纪经济报道
21st CENTURY BUSINESS HERALD

**Title:** *52 Cities Struggle for Placement in the Third Batch of Low-Carbon Pilots and Setting Targets to Peak Carbon Emissions*
**Date:** 23 September 2016

中外对话
chinadialogue

**Title:** *China's Low Carbon City Development: Between Vision and Reality*
**Date:** 8 March 2016

中国发展门户网
CHINAGATE.CN

**Title:** *Low-Carbon Development Paths of APPC Members*
**Date:** 3 February 2016

**Title:** *Progress and Disparities in Cities' Low Carbon Actions*
**Date:** 15 December 2015

## iGDP articles

### 2015

What Commitments were Made at the Climate Leaders Summit?
15/9

Step by Step to a Thousand Miles–iGDP's View on the U.S.-China Joint Presidential Statement on Climate Change
26/9

### 2016

National Low-Carbon Pilots Assessment Start - Walk with Perseverance
8/4

Assessment of Low-Carbon Pilots Experience Sharing Meeting held in Zhenjiang
29/4

What Commitments were Made at the Climate Leaders Summit?
16-18/5

Indices for Green and Low-Carbon Cities Helps Peak Emissions
8/6

[Fax 1 on China-U.S. Summit] *Practices and Experiences in Assessing Low-Carbon Cities*
13/6

[Fax 2 on China-U.S. Summit] *The Challenges and Future of Low-Carbon City Assessments*
14/6

[Fax 3 on China-U.S. Summit] *Indices for Green and Low-Carbon Cities Help Peak Emissions*
16/6

[Fax 4 on China-U.S. Summit] *Feelings and Experiences from the Boston Side*
17/6

Bottleneck in Urban Green Transformation: 3 Key Issues with Energy Data Systems
11/8

Colloquium: *Promoting the Transition to Green and Low-Carbon Cities – Tools and Methods*
5/12

# Green Economy

A green economy is defined as one where growth is decoupled from carbon emissions, environmental pollution and resource exploitation.Instead, growth is based on environmentally-friendly production, industrial and commercial practices. In a green economy, economic growth and sustainable development are mutually compatible. A green economy can realize the optimization of the economic structure, foster new engines of growth, create jobs and raise living standards.

Creating a green economy means improving resource productivity, especially in natural resources, and providing investors with a stable price signal to encourage green investment and stimulate the market for green products, services and technologies.

iGDP closely studies China's green economy and we believe China should, and is capable of,charting its own way towards a green economy. We focus on economic policy, including carbon pricing, environmental taxes, fossil fuel subsidies and green financing policies, and draft independent policy recommendations.

Field products

## Dialogue on Carbon Pricing Policy

The carbon market is one approach out of many to control greenhouse gas emissions, improve energy efficiency, encourage the development of renewable energy and promote green and low-carbon transformation. Existing energy, environmental, and emissions regulation and market mechanisms play key roles in the carbon market. iGDP has published a proposal on making a national carbon market after analyzing and holding discussions and exchanges on carbon markets, related policy, and coordination mechanisms. It has published a working paper called, *Reforming the Power Dispatch Mechanism to Help the National Carbon Market.*

Field activities

## International Seminar on Fossil Fuel Subsidies

The International Seminar on Fossil Fuel Subsidies was held in Beijing on 19 April 2016, a topic that was also debated by recent G20 summits.Current research and international experiences in fossil fuel subsidy reform were discussed in depth, as well as the opportunities and challenges in this regard facing China. The issue has practical significance to tackling climate change, low-carbon development, promoting energy transformation and improving China’s ecological civilization. iGDP organized the seminar with the help of the Natural Resources Defense Council(NRDC), the International Institute for Sustainable Development's Global Subsidies Initiative, Energy Foundation (China) and the Green Center (G: HUB). More than 60 experts, from state organs, scientific research institutions, domestic and overseas think tanks, embassies and other institutions in China attended.

## Forum: Carbon Taxes in China’s Future: Role and Feasibility

The Harvard China Project, the Harvard Global Association, Energy Foundation (China) and iGDP held *the Carbon Taxes in China’s Future: Role and Feasibility Forum* in Beijing from 30 to 31May 2016.

Dale W. Jorgenson, a renowned professor of economics at Harvard University, and He Jiankun, former vice president of Tsinghua University, chaired the forum. Experts and scholars engaged in a heated discussion on a Harvard-China interdisciplinary study of a carbon tax for China and the impacts of a national carbon market. Officials from Canada’s British Columbia’s Department of Environment and scientists from the University of Ottawa took part via video-link.

Advocacy

## Media reports

HARVARDgazette

**Title:** Solving China's Carbon Emissions Problems
**Date:** 14 July 2016

财新 Caixin

**Title:** Environmental Taxes are Not Related to Smog
**Date:** 9 January 2017

## iGDP articles

Fossil Fuel Subsidy Reform Alliance Established and Called to Speed up the Abolition of Fossil Fuel Subsidies
1December 2015

Table Summarizing Research on Coal Consumption in China
11October 2016

# GDTP



## The Green Low-Carbon Development Think Tank Partnership

The Green Low-Carbon Development Think Tank Partnership (GDTP) was set up by the China Energy Research Council Energy Systems Engineering Committee. It is an informal platform that brings together China's leading low-carbon research institutes, economists, and well-known energy and environmental experts. GDTP was launched in June 2014 to facilitate communication and research cooperation between partners and experts, focusing on the best low-carbon research tools and practices at home and abroad and building practical support systems for technology and decision-making.

GDTP promotes green transformation and contributes to the global impact of China's low-carbon development experience. A member of the China Engineering Academy, Mr. Du Xiangwan, Professor He Jiankun, Professor Liu Yanhua, and Professor Zhou Dadi are GDTP senior advisors. It has 37 low-carbon think tank partners and 72 experts. The GDTP Secretariat has executive offices in Beijing and Shenzhen.

Communication platforms

## WeChat

GDTP's WeChat account was established on 15 November 2014. By the end of 2016 it had more than 1,000 followers. It is an influential and interactive platform that is used by GDTP experts to share their opinions and experiences in the field of low-carbon development.

### SelectedArticles

- [Conference Express]How to improve urban low-carbon planning models and methods
- [Conference Express]Are low-carbon planning models and methods available?
- [Conference Express]Is the new normal a challenge or an opportunity for low-carbon transformation?
- [Conference Express]What are the obstacles to, and power of, urban low-carbon transformation?
- [Conference Express]Can China achieve a low-carbon transformation?
- GDTP experts: Trump cannot stop the pace of actions coping with climate change
- The Major Features of *Policies and Practices in China's Low-Carbon Pilot Cities: Bring the Emissions Peak Forward*
- There is no suspense in China's implementation of the Paris Agreement
- Green and Low-Carbon City Development Index will help China's cities peak emissions
- Lin Boqiang: The smog problem cannot be solved in one day
- Du Xiangwan: China's low-carbon road
- Zou Ji: What are the challenges to targets to peak carbon emissions?
- Zhou Dadi: We cannot use up tomorrow's energy investment in one go
- Pan Jiahua: Climate governance and economic development could be win-win
- China must and can achieve green growth
- He Jiankun: Emission reduction and development can be achieved with ambitious INDC goals
- Li Junfeng: An industrial chain is essential for solar energy development
- Zhang Xiaohua: Low-carbon development is the ultimate approach to solving climate change
- Wang Qingyi: Unify energy statistics and improve energy consumption data
- Ma Zhong: An environmental protection law could not go far without a rule where the polluter pays

- Clean energy: Old energy subsidies end, the new energy structure starts
- NDRC expert Kang Yanbing: Low-carbon pilots and urban low-carbon transformation
- Experts Interpretation: Progress made by the *Air Pollution Prevention Law*
- [Focus on annual conference No.1] He Jiankun | Now is the right time for low-carbon development
- [Focus on annual conference No.2] He Jiankun | Peaking is not just about timing, but also about strength
- [Focus on annual conference No.3] He Jiankun | Creating a unified national carbon market requires strategy
- [Focus on annual conference No.4] He Jiankun | The hope that China's model becomes a world-class model
- [Focus on annual conference No.5] Zou Ji |The implementation of the Paris Agreement: links between medium- and long-term strategies and policy measures
- [Focus on annual conference No.6] Tang Jie| A comparison of China and US economic growth and carbon emissions
- [Focus on annual conference No.7] Hal Harvey| How to build a low-carbon city: 12 basic principles of smart green development
- [Focus on annual conference No.8] Lin Ling| Advances in the standardization of international and domestic carbon emissions management
- [Focus on annual conference No.9] Duan Maosheng| Key issues in the design and launch of the national carbon market
- [Focus on annual conference No.10] Qi Shaozhou| The Hubei pilot and the challenges in linking up with the national carbon market
- [Focus on annual conference No.11] Chai Qimin| Cross-regional carbon markets and international cooperation
- [Focus on annual conference No.12] Tang Renhu| National greenhouse gas trading's MRV system
- [Focus on annual conference No.13] Ma Li| Carbon emission reduction in the electricity sector and the carbon market

## Website

The GDTP website,www.gdtpchina.cn went online in December 2015.

## Books Published

### Policies and Practices in China's Low-Carbon Pilot Cities: Bring the Emissions Peak Forward

More than 60 experts working in low-carbon research contributed to this book, which was published in Beijing on 19 October 2016. The book explores targets to peak emissions, pathways and practices of controlling greenhouse gas emissions, the policies and actions of national low-carbon pilots and other national demonstration projects related to low-carbon development. It also covers the latest research and includes practical examples to evaluate how cities are doing in transforming to a low-carbon development model. Shenzhen, Qingdao, Wuhan, Hangzhou, Beijing and 12 other cities are covered in this title,as are examples from industry including electricity, construction, transportation, the carbon market, and eco-cities among others. The book provides valuable lessons on low-carbon development that can be used by other pilot cities.

### Series of Translated Books by Low-Carbon Think Tanks

Professor He Jiankun led this project. The Northeast University of Finance and Economics Press organized a translation team to publish this series of titles with the support of iGDP. Eight titles had published by the end of 2016.

### Energy Data Manual

GDTP expert Wang Qingyi has devoted himself to studying China's energy statistics for more than a decade and has released the Energy Data Manual every year. The Manual uses data from domestic and overseas sources, and uses internationally-accepted energy indices, definitions, and approaches. It compares global data and includes in-depth analyses. iGDP has made an English translation of *2015 Energy Data*. *2016 Energy Data* was released in Chinese at the end of 2016. The report can be downloaded at www.igdp.cn/webproduct/pub .

Conference

## GDTP 2016 Annual Conference

The GDTP 2016 Annual Conference,*Green Low-Carbon Development: Challenges and Tasks Following the Paris Agreement* was held in Beijing on 24 January 2016 with more than 100 experts, scholars and representatives of the organization discussing the challenges and tasks of green and low-carbon development following the Paris Agreement.

## Sub Forum: Green Finance at Shenzhen International Low-Carbon Forum

GDTP organized this sub-forum on the sidelines of the Fourth Shenzhen International Low-Carbon Forum, which was held between 17and 18 June 2016.

## Press Conference for a Book Release: Policies and Practices in China's Low-Carbon Pilot Cities: Bring the Emissions Peak Forward

A seminar and book release, *Low-Carbon City Construction under the New Normal* was held on 19 October 2016 in Beijing. Some of the book's contributing authors, representatives of low-carbon pilots and experts reviewed progress on China's low-carbon pilot cities and discussed future trends. Experts introduced approaches and models to urban planning on peaking emissions.

## China Energy Research Association Energy System Engineering Committee 2017 Annual Meeting and Green & Low-Carbon Development Think Tank Partnership (GDTP) Annual Conference

January 21-22, 2017, China Energy Research Society of Energy Systems Engineering Committee 2017 Annual Meeting and Green & Low-Carbon Development Think Tank Partnership Annual Conference was hold in Shenzhen.

More than 100 experts attended the seminar and took part in heated discussions on topics including the implementation of the Paris Agreement and the macro-strategy of green low-carbon development, local 13th Five-Year Plans on temperature control, urban peaking practices, local and corporate actions during the launch of the national carbon market and energy / carbon emission models.

Following the conference, 13 articles were published on GDTP's website, summarizing these discussions. The articles were also posted to GDTP’s WeChat account, attracting wide attention.

## Special Column

GDTP partnered with *Environmental Economy Research* and *China's Population Resources and the Environment* to create a special column for publishing papers written by GDTP experts.

## Media Reports

**Title:** The new book Policies and Practices in China's Low-Carbon Pilot Cities: Bring the Emissions Peak Forward is released
**Date:** 4 July 2016

**Title:** The new book Policies and Practices in China's Low-Carbon Pilot Cities: Bring the Emissions Peak Forward is released
**Date:** 4 July 2016

**Title:** China's Low Carbon City Construction Guide published after two years of hardwork by 63 experts
**Date:** 4 July 2016

**Title:** The new book Policies and Practices in China's Low-Carbon Pilot Cities: Bring the Emissions Peak Forward is released.
**Date:** 4 July 2016

**Title:** The new book Policies and Practices in China's Low-Carbon Pilot Cities: Bring the Emissions Peak Forward is released.
**Date:** 4 July 2016

# Reports

## Suggestions on the Principles and Objective-Setting for Low-Carbon Pilots

Li Ang[1] Dr. Yang Li[2] Tian Zhiyu[3]

### Summary

Low-carbon pilots are considered an important initiative for China to ensure its GHG emissions peak before 2030. This article aims to offer concrete criteria and recommendations for low-carbon provinces and cities on good planning and setting targets. It uses government documents (for example, national and sectorial plans, action plans and guidelines) on energy consumption and GHG emissions. It covers mandatory and recommended objectives, national demonstration project goals, and key emission industry regulations and standards.

It is hoped this paper will be useful for pilot regions as they prepare or implement a low-carbon transition. This paper may also help with evaluating pilots' performances and aid in benchmarking pilots against each other, thus driving progress in low-carbon development nationwide.

Cities are the country's key locations for economic and industrial activities; they are also top consumers of energy and the main causes of environmental loads. According to a United Nations Environment Program (UNEP) report, cities consume 60-80% of the world's energy and generate 75% of the carbon emissions (UNEP, 2013).Because of the global challenges of climate change, cities are struggling to reduce their carbon emissions.

China has launched three batches of low-carbon pilots since 2010. Currently, there are 79 cities, six provinces and two counties with low-carbon pilots.The First U.S.-China Climate Leaders' Summit in Los Angeles set up the Alliance of Peaking Pioneer Cities (APPC) in 2015. Today, 21 cities and two provinces in China belong to the Alliance.

The complexity of economic activity leads to a diversity of GHG emissions sources. Currently there is no consensus on a universal indicator system or benchmarking reference system on low-carbon development for Chinese cities because activities are defined differently in different regions. This poses a challenge in evaluating performances and in making informed decisions on adjusting policies and measures to improve low-carbon development.

The main drivers of urban GHG emissions are from the energy supply and demand sides -- for example,industry, building and transportation, and waste management. By reviewing national policies and requirements on GHG mitigation, we suggest that low-carbon regions should use standards based on local circumstances and expectations:

[1] Senior Analyst, innovative Green Development Program (iGDP)
[2] Senior Analyst, innovative Green Development Program (iGDP)
[3] Associate Researcher, Energy Research Institute, NDRC

1.To achieve binding targets and apply quantitative standards from national planning documents.
2.To follow strict specifications of pilot programs, e.g. green buildings and renewable energy pilot programs.
3.In addition to completing national demonstration programs, low-carbon cities are encouraged to set ambitious goals based on local conditions.

A city's low-carbon index should include quantitative and qualitative indicators, covering macro-economic performance and key emission sectors. They can be divided into eight groups: overall goals, industry, city planning, energy, transportation, buildings, carbon sinks and waste management. This paper will consider each in turn.

## 1.Overall goals in low-carbon development

The goals listed in Table 1 cover a city's carbon efficiency in terms of its macro-economic performance. In China, energy and carbon intensity targets are binding targets in cities' economic and social development plans. After the country announced it would peak its carbon emissions by around 2030, the key tasks for low-carbon pilots have been to decide on the level of peak emissions and the timetable for peaking emissions. Eighty-one regions from three batches of low-carbon pilots have set a year to peak emissions; all intend to peak before 2030, except for Chongqing, which said it will peak emissions by 2035.

*Table 1 Key Indicators (Overall Goals)*

| Year | Indicator | Target | Reference | Attribute |
|---|---|---|---|---|
| 2020 | $CO_2$ reduction per GDP (compared to 2015) | 18% (provincial targets please see Table 2) | Work Plan for Greenhouse Gas Emission Control during the 13th Five-Year Plan Period | Binding |
| | Energy reduction per GDP(compared to 2015) | 15% | Work Plan for Greenhouse Gas Emission Control during the 13th Five-Year Plan Period | Binding |
| Around 2030 | Peak national carbon emissions | | China-U.S. Joint Announcement on Climate Change | Binding |

*Table 2 Carbon Reduction per GDP targets for Provinces and Municipalities (compared with 2015)*

| No. | City/Provinc | Target | No. | City/Provinc | Target | No. | City/Provinc | Target |
|---|---|---|---|---|---|---|---|---|
| 1 | Beijing | 20.5% | 12 | Hubei | 19.5% | 23 | Inner Mongolia | 17% |
| 2 | Tianjin | 20.5% | 13 | Chongqing | 19.5% | 24 | Heilongjiang | 17% |
| 3 | Hebei | 20.5% | 14 | Sichuan | 19.5% | 25 | Guangxi | 17% |
| 4 | Shanghai | 20.5% | 15 | Shanxi | 18% | 26 | Gansu | 17% |
| 5 | Jiangsu | 20.5% | 16 | Liaoning | 18% | 27 | Ningxia | 17% |
| 6 | Zhejiang | 20.5% | 17 | Jilin | 18% | 28 | Hainan | 12% |
| 7 | Shandong | 20.5% | 18 | Anhui | 18% | 29 | Tibet | 12% |
| 8 | Guangdong | 20.5% | 19 | Hunan | 18% | 30 | Qinghai | 12% |
| 9 | Fujian | 19.5% | 20 | Guizhou | 18% | 31 | Xinjiang | 12% |
| 10 | Jiangxi | 19.5% | 21 | Yunnan | 18% | | | |
| 11 | Henan | 19.5% | 22 | Shaanxi | 18% | | | |

## 2.Low-Carbon Industry

Industry is the biggest energy consumer and source of GHG emissionsin most Chinese cities. China's secondary industry is heavily focused on heavy industry, so that upgrading industry, improving energy efficiency and using renewable fuels are the key approaches to transforming the industrial sector to a low-carbon one. The key indicators for evaluating low-carbon industry are energy intensity, energy consumption per unit product and energy consumption quotas for energy intensive products.

A number of cities have introduced guidance documents on promoting the service sector and emerging and strategic industries. The share of GDP made up by services and emerging and strategic industries is a non-binding target included in cities' economic and social development plans.

It is also recommended that other administrative measures (such as limiting emissions in key areas and applying acompulsory energy consumption quota on energy-intensive industries) should be applied in low-carbon pilots.

1）Encourage the growth of emerging and strategic industries. Pilot regions should refer to the NDRC's *Catalogue of Major Products and Services of Strategic and Emerging Industries*[4] to guide investment into industrial upgrading. The *Catalogue for Promoting the National Key Energy-saving Technologies and Low-carbon Technologies* may also be helpful.

2）Emissions from key sectors should peak early. The *Action Plan of Industries Addressing Climate Change (2012-2020)* lists requirements for key industries:

a.Total emissions from industry should peak by 2020;

b.$CO_2$ emissions from the steel and cement industries should not rise above 2015 levels.

3）Significantly cut non-$CO_2$ emissions from industry, pilots should follow the request from the *Action Plan of Industries Addressing Climate Change (2012-2020) to reduce fluorine gas emissions.*

4）Systematically improve low-carbon development in industry by strictly applying national/sectorial standards, low-carbon product certification[5] and top-runner programs. *Mandatory Standards for Energy Intensive Products* should be made the market access standard for energy-intensive industries.[6] The *Top Runner Program for Energy Intensive Industries*[7] should be made the non-binding standard.

*Table 3 Key Indicators for Low-Carbon Industry*

| Year | Indicator | Target | Reference | Attribute |
|---|---|---|---|---|
| 2020 | Service industry valued added (% GDP) | 56% | Greenhouse Gas Emission Control during the 13th Five-Year Plan Period | Indicative |
| | Emerging and strategic industries value added (% GDP) | 15% | Greenhouse Gas Emission Control during the 13th Five-Year Plan Period<br>Notice on the Development Plan for Emerging and Strategic Industries during the 13th Five-Year Plan Period | Indicative |

[4] The Catalogue of Major Products and Services of Strategic and Emerging Industries includes five sectors in eight industries with 4,000 products and services.

[5] NDRC, AQSIQ and CNCA have released two low-carbon certification lists of seven types of products.

[6] Energy-intensive products are: cement, copper/zinc/lead,/nickel smelting, construction and sanitation ceramics, steel production, caustic soda, coal power generation, plate glass, coke, calcium carbide, synthesis ammonia, titanium alloy, electrolytic aluminum, magnesium (tin, antimony) smelting, copper and copper alloy, aluminum alloy profiles, carbon,secondary lead, alumina, aluminum and aluminum alloy, and drawn pipe, etc.

[7] The Top-runner Program for Energy Intensive Industries covers best efficiencies for the cement, ethylene, compound ammonia, plate glass and liquid aluminum industries. Please see Table 3 for details.

| | | | | |
|---|---|---|---|---|
| 2020 | Annual growth rate of inventions and patents | 15% | Notice on the Development Plan for Emerging and Strategic Industries during the 13th Five-Year Plan Period | Indicative |
| | Decrease in industrial energy intensity (from 2015 levels) | 18% | Made in China (2025)<br>Industrial Green Development Plan | Indicative |
| | Decrease in $CO_2$ emission intensity (from 2005 levels) | 50% | Action Plan of Industries Addressing Climate Change (2012-2020) | Indicative |
| | Decrease in $CO_2$ emission intensity (from 2015 levels) | 22% | Greenhouse Gas Emission Control during the 13th Five-Year Plan Period | Indicative |
| | Reduction of HCFC-22 production (based on 2010 levels) | reduce 35% | Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions | Indicative |
| | Percentage of industrial solid waste utilized<br>Tailings<br>Gangue<br>Industrial by-product gypsum<br>Slag<br>Red mud | 73%<br>25%<br>71%<br>60%<br>95%<br>10% | Made in China (2025)<br>Green Industry Development Plan | Indicative |
| | Energy consumption per ton of steel produced(kg SCE/ton) | 560 | Green Industry Development Plan （2016-2020） | Indicative |
| | Energy consumption per ton of cement clinker produced (kg SCE/ton) | 105 | | |
| | AC power consumption for electrolytic aluminum (kWh / t) | 13200 | | |
| | Comprehensive energy consumption of the refinery sector per ton produced (KgOE/ton) | 63 | | |
| | Comprehensive energy consumption per ton of ethylene produced (kg SCE/ton) | 790 | | |

| | | | | |
|---|---|---|---|---|
| 2020 | Comprehensive energy consumption per ton of compound ammonia produced(kg SCE/ton) | 1300 | Green Industry Development Plan | Indicative |
| | Overall energy consumption per ton of paper and paperboard produced (kg SCE/ton) | 480 | | |
| | Decrease in water consumption per unit industrial added value | 23% | | |
| | Proportion of green and low-carbon energy consumption of total industrial energy | 15% | | |
| | Proportion of six high energy-consuming industries of total industrial added value | 25% | | |
| 2025 | Decrease in energy intensity (from 2015 levels) | 34% | Made in China (2025) | Indicative |
| | Decreasein $CO_2$ emission in tensity (from 2015 levels) | 40% | | |
| | Percentage of industrial solid waste utilized | 79% | | |
| | Decreasein HCFC-22 produced (from 2010 levels) | reduce 67.5% | Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions | Indicative |

| Market Based Instrument | | |
|---|---|---|
| Top Runner Program for Energy Intensive Industries | Ethylene | 525.69 kgoe/t~543.01 kgoe/t |
| | Compound ammonia | 1082 kgce/t (anthracite)<br>1229 kgce/t (non-high quality anthracite)<br>1381 kgce/t (bituminous coal)<br>1010 kgce/t (natural gas) |

| | | |
|---|---|---|
| Top Runner Program for Energy Intensive Industries | Cement | 96.62 kgce/t~102.58 kgce/t |
| | Plate glass | 11.76 kgce / weight box（600t/d float line）<br>10.63 kgce / eight box（900t/d float line） |
| | Liquid | 12643.0 kWh/t~12648.6 kWh/t |
| Low-carbon Product Certification | The first batch low-carbon certification products | Portland cement<br>Plate glass<br>Aluminum alloy profile<br>Medium and small 3-phase asynchronous electric motors |
| | The second batch of low-carbon certification products | Buildings ceramic tiles<br>Tires<br>Textiles |

## 1.Overall goals in low-carbon development

The buildings sector consumes more than 25% of China's total energy and that is expected to increase to 33% shortly (MOHURD, 2006). Many factors affect carbon emissions from the buildings sector, including building materials, building envelope, heating and cooling systems and equipment efficiency. If the entire life cycle of buildings is taken into account, the lifestyle habits of residents will also significantly impact GHG emissions.

Design standards on buildings energy efficiency and implementation, retrofitting of existing buildings, the proportion of green buildings and renewable energy powered buildings are key indicators in the low-carbon buildings sector.

Design standards on the energy efficiency of buildings (building codes) are the technical basis for the construction of energy-saving buildings. The first building code was the Design Standard for the Energy Efficiency of Residential Buildings (heating) that was introduced in 1986. That standard aimed to reduce energy consumption by 30%[8] from 1980-1981 levels. It was amended in 1995 to boost energy saving to 50%.

Other standards include the Design Standard for Energy Efficiency of Residential Buildings in Severe Cold and Cold Regions(JGJ26-2010) with a target to reduce energy consumption by 65%,the Design Standard for Energy Efficiency of Residential Buildings in Hot-Summer and Warm-Winter Regions (JGJ75-2003) and the Design Standard for Energy Efficiency of Public Buildings for various climate zones and building types. We recommend that in addition to adhering to the above design standards, low-carbon pilots should also take the following actions:

[8] The Design Standard for Energy Efficiency of Residential Buildings in Severe Cold and Cold Regionsis based on a study of heating in residential buildings in 1980 and 1981. Design standards for other climate zones are based on other calculations.

1) Strictly implement the mandatory energy efficiency standards for new buildings. Carry out the NDRC's and MOHURD's Green Building Action Plan and ensure all new buildings qualify for energy saving standards during the design stage as this will help to speed up the number of green buildings. Improve supervision and inspection of construction to ensure the energy saving standard is honored. Buildings that do not qualify should not be put into use until they pass.

2) Low-carbon regions are encouraged to set up strict building codes that match local conditions, such as climate. As national or industrial standards may not be suitable for some geographic conditions, it is recommended that pilot regions design their own building codes based on local demands. For example, Beijing introduced its own Design Standard for Energy Efficiency of Residential Buildings (DB11/891-2012) (calling for 75% energy efficiency).Shanghai, Chongqing and Shaanxi also have their own energy-saving standards for buildings.

3) Improve supervision of energy-intensive buildings. Strictly follow MOHURD's Notice for Further Strengthening Energy Conservation of Public Buildings on reporting energy consumption data for all large-scale public buildings. Identify key buildings based on energy consumption per $m^2$ and total energy consumption. Use itemized metering, online monitoring and energy consumption quotas with key buildings. At least 50% of key buildings should undergo an energy audit. Buildings with the highest energy consumption per m2 or the highest total energy consumption should be issued with a public notice.

4) Energy consumption standards should be made mandatory for the approval of all new buildings. Energy efficiency assessments should be compulsory in the final stages of approval. [9]

We also recommend using advanced energy efficiency labeling, energy quotas and equipment standards during the construction stage.

*Table 4 Key Indicators for the Building Sector*

| Year | Indicator | Target | Reference | Attribute |
|---|---|---|---|---|
| 2018 | Percentage use of green building materials in new buildings | 30% | The Action Plan for Promoting the Production and Application of Green Building Materials | Indicative |
| | Percentage use of green building materials in green buildings | 50% | | Indicative |
| | Percentage use of green building materials in demonstration pilot projects | 70% | | Indicative |
| | Percentage use of green building materials in the retrofit of existing buildings | 80% | | Indicative |

[9] Mentioned in Notice on Further Strengthening the Energy Conservation of Public Buildings.

| | | | | |
|---|---|---|---|---|
| 2020 | Percentage of urban residential buildings that have completed an energy-saving retrofit in the northern heating zone | 100% | Green Building Action Plan （2016-2020） | Indicative |
| | Percentage of renewable energy in buildings in total energy consumption | more than 15% | Notice of the Ministry of Housing and Urban-Rural Development on Further Strengthening the Application of Renewable Energy in Buildings | Indicative |
| | Percentage of urban green buildings in all new buildings | 50% | National Plan on Climate Change (2014-2020)<br>Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions | Indicative |

| Pilot Programs | |
|---|---|
| Demonstration Cities for Building Integrated Renewable Energy Action Plan | To develop a plan for using renewable energy in the construction sector<br>Not less than 2 million $m^2$ of renewable energy buildings in new buildings (percentage should not be lower than 30%) in prefecture-level cites;<br>Not less than 300 million $m^2$ of renewable energy buildings in new buildings in municipalities and sub-provincial cities;<br>Prioritize support for cities introducing policies and regulations on encouraging renewable energy buildings. |
| Establishing a Supervisory System for Energy Conservation in State Organs and Public Buildings Implementation Plan | Energy monitoring<br>Buildings' energy consumption data<br>Energy audits<br>Public notification of energy efficiency<br>Institutional improvement |

## 4.Low-Carbon Transport

The transportation sector is the second largest global source of GHG emissions (李, 2013). According to research at Harvard University, China's transportation sector accounted for around 6% of carbon emissions in 2012(刘, 2015). However, with the increase in car ownership and the improvement in people's living standards, emissions from transport are expected to increase dramatically.

One approach the sector can use to save energy and reduce emissions is in encouraging the use of public transport. A Japanese research team found that buses release 30% less emissions compared with cars per unit traffic volume. Rail is even more energy efficient and non-motorized traffic (walking and cycling) is categorized as zero emissions.

Key indicators in transportation are mode share of public transport, reduction of $CO_2$ emissions per freight/passenger volume, $CO_2$ emission intensity per turnover volume of highways, railways, waterways and airways and the transport structure for passengers and freight.

1) Build an efficient urban transport system and prioritize Transit Oriented Development (TOD). Use *Implementation Opinions on the Guidance of Prioritizing Public Transportin Urban Areas* to improve urban transportation and public transportation plans, which should then become part of regulatory plans once approved by local governments.

2) Build a transportation system that is appropriate to the size of the city. Use the *12th Five-Year Plan for Transportation Development* to develop a public transportation system that is appropriate for the city.

- *Cities with a population of more than 3 million:rail and BRT systems should provide the main public transport system as well as being serviced by public buses.*

- *Cities with a population of between 1 to 3 million: public buses should provide the main public transport system, with support from rail and BRT systems.*

- *Cities with a population of less than 1 million:public buses should provide the main public transport system.*

Low-carbon regions may refer to the *13th Five-Year Development Outline for Public Transport in Cities and Implementation Opinions on the Guidance of Prioritizing Public Transportin Urban Areas* and set targets according to local circumstances.

- *Cities with a population of above 3 million should establish a local rapid transit system with bus lanes, a BRT system and rail transit by 2020.*

- *Cities with a population of above 1 million should establish a dispatch system, a safety monitoring system and a rapid response system for public transport and set up inter-city and provincial electronic passes.*

The Transport Metropolis Demonstration Project has developed a system of 20 mandatory indicators, 10 reference indicators and three additional indicators. Low-carbon regions may take these standards as targets to guide the development of their transportation sector.

*Table 4* *Key Indicators for the Transportation Sector*

| Year | Indicator | Target | Reference | Attribute |
|---|---|---|---|---|
| 2020 | Cities with a permanent population of over 5 million | 40% | Several Opinions on Further Enhancing the City Planning and Construction Management Issued by the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council | Indicative |
| | Share of public transit[9] | 60% | | |
| | Urban public transport share[10] | 75% | | |
| | Percentage of urban bus stops at least every 500-m | 100% | | |
| | Percentage of urban bus stops every 30-m | 80% | | |
| | Bus arrival information | covering all region | The 13th Five-Year Development Outline for Public Transport in Cities | |

[10]Urban public transport share is the percentage of urban public transport travel volume out of total travel made by city residents in the city centre in a defined period.

[11] Urban green transport share is the percentage of green transport volume (including public transport, cycling, and walking) out of total travel made by city residents in the city centre in a defined period.

| | | | | |
|---|---|---|---|---|
| 2020 | Cities with a permanent population of between 3 and 5 million<br>Share of public transit;<br>Urban green transport share；<br>Percentage of urban bus stops at least every 500-m;<br>Percentage of urban bus stops every 30-m;<br>Bus arrival information | 30%<br>60%<br>80%<br>100%<br>70%<br>covering all regions | National Plan on Climate Change (2014-2020)<br>The 13th Five-Year Development Outline for Public Transport in Cities | Indicative |
| | Cities with a permanent population of between 1 and 3 million Share of public transit;<br>Urban green transport share；<br>Bus arrival information | more than 30%<br>80%<br>covering all regions | National Plan on Climate Change (2014-2020) | Indicative |
| | Cities with a permanent population of less than 1 million Mode share of public transit;<br>Urban green transport share；<br>Bus arrival information | 20%<br>85%<br>covering main passenger channels | Several Opinions on Further Enhancing the City Planning and Construction Management Issued by the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council<br>The 13th Five-Year Development Outline for Public Transport in Cities | Indicative |
| | Average increase in road network density in urban areas | 8km/km$^2$ | Several Opinions on Further Enhancing the City Planning and Construction Management Issued by the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council | Indicative |
| | Percentage of road area | 15% | Several Opinions on Further Enhancing the City Planning and Construction Management Issued by the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council | Indicative |
| | Fuel consumption of passenger vehicles (L/km) | 5.0 | Energy Saving and New-energy Automobile Industry Development Planning（2012—2020 year) | Indicative |
| | Fuel consumption of energy-saving passenger vehicles (L/km) | 4.5 | Energy Saving and New-energy Automobile Industry Development Planning（2012—2020 year) | Indicative |

| | | | | |
|---|---|---|---|---|
| 2020 | Decrease in $CO_2$ emissions per unit passenger volume from road transport(from 2015 levels) | 12.5% | Notice of the State Council on Issuing the Work Plan for Greenhouse Gas Emission Control during the 13th Five-Year Plan Period | Indicative |
| | Decrease in $CO_2$ emissions per unit passenger turnover (from 2010 levels) | 5% | National Plan on Climate Change (2014-2020) | Indicative |
| | Decrease in $CO_2$ emissions per unit freight volume from road transport (from 2010 levels) | 13% | National Plan on Climate Change (2014-2020) | Indicative |
| | Decrease in $CO_2$ emissions per unit freight volume from railways (from 2010 levels) | 15% | National Plan on Climate Change (2014-2020) | Indicative |
| | Decrease in $CO_2$ emissions per unit passenger turnover from waterways (from 2010 levels) | 13% | National Plan on Climate Change (2014-2020) | Indicative |
| | Decrease in $CO_2$ emissions per unit passenger volume from airways (from 2010 levels) | 11% | National Plan on Climate Change (2014-2020) | Indicative |
| | Energy intensity indicators:<br>Decrease in the energy consumption of commercial vehicles per unit turnover (from 2015 levels):<br>Commercial passenger vehicles<br>Commercial freight vehicles<br>Commercial vessels | <br><br><br>About 26%<br>About 8%<br>About 7% | Notice of the State Council on Issuing the Work Plan for Greenhouse Gas Emission Control during the 13th Five-Year Plan Period | Indicative |
| | Cities with a population of over 1 million vehicle ownership per 10,000 people;<br>Parking rate for conventional public vehicles;<br>Percentage of public transport made up by motorized travel | 16 standard vehicles<br>70%<br>60% | Implementation Opinions on the Guidance of Prioritizing Public Transit in Urban Area Issued by the State Council | Indicative |

| Pilot | |
|---|---|
| Notice on the National Transport Metropolis Demonstration Project | Mode share of public transport to increase by 2% per year<br>Mode share of public transport to rise to 45% for cities with rail transit 40% for cities without rail transit<br>Density of public transport network to reach 3km/km$^2$<br>Vehicle ownership per 10,000 residents to reach 15<br>The percentage of bus stops every 500m to reach 90%<br>Conventional vehicle average speed to increase at least 5% per year |
| Guiding Opinions on Accelerating the Promotion and Application of New-Energy Automobiles | New-energy vehicles to make up at least 30% of all new vehicles<br>Quota for new-energy vehicles in new vehicles for central or local governments to rise above 30% |

## 5. Low-Carbon Energy

Fossil fuels play a dominant role in China's energy mix. In 2015, the country consumed 4.3 billion tce of energy, of which coal consumption was 3.96 billion tce (64.0%), representing a decline of 2% compared with 2014(National Bureau of Statistics, 2016). Hydro, wind, nuclear and natural gas made up 17.9%(National Bureau of Statistics, 2016). Key measures for low-carbon cities are increasing the use of non-fossil fuels, increasing the demand-side electricity consumption percentage, and improving energy efficiency.The National Economic and Social Development Plan and the Five-Year Plan for the Power Industry also mention coal consumption in thermal power supply per kWh and the share of renewable energy in primary energy consumption.

Decarbonizing the power sector can be achieved by introducing a feed-in tariff, upgrading coal power facilities, promoting combined heat and power (CHP) generation and establishing regional central heating systems. Other key tasks for low-carbon regions include:

3) Setting coal caps. China must dramatically reduce coal consumption if it is to complete an energy transition. Many regions have prioritized setting coal caps because of severe air pollution. Low-carbon pilots should carry out the key tasks and targets set out in *Interim Measures for Alternative Management of Coal Consumption Reduction in Key Areas* and the *Work Plan for Enhancing Air Pollution Control and Coal Consumption Caps in Key Cities*[12]:

- *Coal consumption in 2017 should be reduced over 2012 levels in Beijing (by 13 million tons), Tianjin (by 10 million tons), Hebei (by 40 million tons) and Shandong (by 20 million tons).*

- *Coal consumption should be falling year-on-year in key cities by the end of 2020.*

- *Local governments in key cities should develop work plans for replacing and reducing coal consumption, with clear annual targets and clear targets for counties, districts, and energy intensive industries and enterprises.*

- *Energy and environmental impact assessments must be completed for all new constructions or projects to ensure energy efficiency passes the domestic*

[12] Key cities are Baoding, Xingtai, Shijiazhuang, Tangshan, Handan, Hengshui, Jinan, Langfang, Zhengzhou and Tianjin.

*advanced standard. For coal intensive industries, new capacity will not be approved unless it replaces outdated capacity.*

- *The coal consumption of newly built projects should be included in the regional total coal consumption reduction plan. New coal capacity should meet requirements in the reduction of total coal consumption in key cities before conducting energy conservation and environmental impact assessments.*

- *Key cities should limit the use of low quality coal (such as scattered coal with an ash content of more than 16% or a sulfur content of more than 1%). Warning cities[13] should improve air quality and energy consumption monitoring and plan for capping energy consumption.*

3) Significantly improving coal power generation efficiency. Strictly enforcing key targets in the *Up grading and Transforming Energy Conservation and Emission Reduction of Coal-Fired Power Action Plan (2014-2020):*

- *Newly installed capacity in coal power should use 600MW Ultra-Supercritical Boilers. Coal consumption for power supply in1GW capacity wet and air-cooled units should not exceed 282 and 299gce/kWh respectively. Facilities with 600MW capacity, wet and air-cooled unit shouldnot exceed 285 and 302gce/kWh respectively.*

- *Coal consumption of facilities using circulating fluidized beds with installed capacity of 300 MW should not exceed 310 and 327gce/kWh for water and air-cooled units. Facilities with installed capacity of 600MW should not exceed 303 and 320gce/kWh for water and air-cooled units.*

- *By 2020, the power sector's coal consumption should be less than 310gce/kWh.*

Promoting CHP plants. *The development of large-scale CHP (especially back-pressure units) and combined cooling, heat and power (CCHP) should be encouraged in cities according to their circumstances.*

Table 6 *Key Indicators for the Energy Sector*

| Year | Indicator | Target | Reference | Attribute |
|---|---|---|---|---|
| 2017 | Share of non-fossil fuels in primary energy consumption | 13% | Air Pollution Prevention and Control Action Plan (Energy Sector) | Indicative |
| 2017 | Share of natural gas in primary energy consumption | 9% | Air Pollution Prevention and Control Action Plan (Energy Sector) | Indicative |
| 2020 | Share of non-fossil fuels in primary energy consumption | over 15% | The 13th Five-Year Plan for the Power Industry | Binding |
| 2020 | Share of coal in primary energy consumption | Less than 58% | The 13th Five-Year Plan on Energy | Binding |

13 Warning cities are Shenyang, Beijing, Cangzhou, Taiyuan, Xi' an, Nanjing, Urumchi, Chengdu, Wuhan and Qinhuangdao.

| | | | | |
|---|---|---|---|---|
| 2020 | Average coal consumption of newly installed coal power generation (gce/ kWh) | 300 | The 13th Five-Year Plan for the Power Industry | Binding |
| | Average coal consumption of existing coal power generation (g/kWh) | less than 310 | The 13th Five-Year Plan on Energy | Binding |
| | Share of non-fossil fuels in total installed capacity | 39% | The 13th Five-Year Plan for the Power Industry | Indicative |
| | Share of non-fossil fuels in total power generation | 31% | The 13th Five-Year Plan for the Power Industry | Indicative |
| | Share of electricity consumption in total energy consumption | 27% | The 13th Five-Year Plan on Energy | Indicative |
| | Electricity consumption per capita (kWh) | 4860-5140 | The 13th Five-Year Plan for the Power Industry | Indicative |
| | Share of natural gas in primary energy consumption | over 10% | National Plan on Climate Change (2014-2020)Energy Development Strategy Action Plan (2014-2020) | Indicative |
| | Share of coal for power generation in total coal consumption | More than 55% | The 13th Five-Year Plan for Energy Development | Indicative |
| | Share of CHP capacity in total coal installed capacity | 28% | Action Plan on Upgrading and Transforming the Energy Conservation and Emission Reduction of Coal-Fired Power (2014-2020) | Indicative |
| | Share of coal installed capacity in total installed capacity | 55% | The 13th Five-Year Plan for the Power Industry | Indicative |
| | Percentage of central heating made up by CHP units in northern medium- and large-sized cities | over 60% | The 13th Five-Year Plan for the Power Industry | Indicative |

| | | | | |
|---|---|---|---|---|
| 2020 | $CO_2$ emissions from power sector (g/kWh) | 550 | Notice of the State Council on Issuing the Work Plan for Greenhouse Gas Emission Control during the 13th Five-Year Plan Period | |
| | $CO_2$ emissions from coal power (g/kWh) | 865 | The 13th Five-Year Plan for the Power Industry | |
| | Renewable energy quotas for provinces, autonomous regions and municipalities | see table 7 | Proportion index of non-hydro renewable energy in total electricity consumption | |

| Demonstrations | |
|---|---|
| Evaluation Indicator System for New-Energy Pilot Cities | Application conditions:<br>• More than 6% of energy consumption should be from new energy<br>• Or new energy use should reach 100,000 tce/ year<br>Evaluation criteria (minimum two):<br>• Solar collector area ≥ 100 million $m^2$ or solar collector area ≥ 360 $m^2$/ 1,000 people<br>• Installed capacity of distributed solar PV ≥ 2 MW<br>• Installed capacity of distributed wind power ≥ 10 MW<br>• Total consumption of biomass energy ≥100,000 tce/year<br>• Above designated size geothermal heating, pump heating (cooling) construction area ≥ 3,000,000$m^2$ |

*Table 7 Renewable Energy Quotas for Provinces and Municipalities(2020)*

| No. | City/Provinc | Renewable energy quota | No. | City/Provinc | Renewable energy quota | No. | City/Provinc | Renewable energy quota |
|---|---|---|---|---|---|---|---|---|
| 1 | Beijing | 10% | 12 | Hubei | 7% | 23 | Inner Mongolia | 13% |
| 2 | Tianjin | 10% | 13 | Chongqing | 5% | 24 | Heilongjiang | 13% |
| 3 | Hebei | 10% | 14 | Sichuan | 5% | 25 | Guangxi | 5% |
| 4 | Shanghai | 5% | 15 | Shanxi | 10% | 26 | Gansu | 13% |
| 5 | Jiangsu | 7% | 16 | Liaoning | 13% | 27 | Ningxia | 13% |
| 6 | Zhejiang | 7% | 17 | Jilin | 13% | 28 | Hainan | 10% |
| 7 | Shandong | 10% | 18 | Anhui | 7% | 29 | Tibet | 13% |
| 8 | Guangdong | 7% | 19 | Hunan | 7% | 30 | Qinghai | 10% |
| 9 | Fujian | 7% | 20 | Guizhou | 5% | 31 | Xinjiang | 13% |
| 10 | Jiangxi | 5% | 21 | Yunnan | 10% | | | |
| 11 | Henan | 7% | 22 | Shaanxi | 10% | | | |

## 6. Low-Carbon Agriculture

GHG emissions from agriculture include direct emissions from growing crops and livestock farming and indirect emissions from the manufacture of agricultural inputs. Direct emissions from the farming sector can account for up to 12% of human emissions with variations from place to place (Zhang, 2015).

The emissions are $N_2O$ from dry fields and methane from paddy fields and animal digestion. Together they account for 60% of all agricultural GHG emissions (Zhang, 2015).

Methodologies for calculating the emissions from livestock and crop growing are different. Emissions from livestock are calculated from herd sizes, how waste is handled, and the type of livestock since cows and sheep, for example, produce different amounts of waste. In arable farming, calculations take into account the volume of fertilizer used.

Many factors influence agricultural emissions. Dietary changes have driven demand for animal protein that has caused methane emissions to rise. The sector is using much more fertilizer and pesticides and producing more agricultural waste (livestock manure and straw) and these also drive up emissions.

In the first two batches of low-carbon pilots, 22 prioritized low-carbon agriculture. Low-carbon regions should focus on reducing fertilizer use and recycling pesticides and waste.

*Table 8 Key Indicators for Agriculture*

| Year | Indicator | Target | Reference | Attribute |
|---|---|---|---|---|
| 2020 | Fertilizer consumption | Zero growth | Work Plan for Greenhouse Gas Emission Control during the 13th Five-Year Plan Period | Indicative |
| | $N_2O$ emissions from fields | Peak | Work Plan for Greenhouse Gas Emission Control during the 13th Five-Year Plan Period | Indicative |
| | Percentage of large-scale livestock farms with waste treatment facilities | 75% | Implementation Opinions on Preventing and Controlling Agricultural Non-Point Source Pollution | Indicative |

| Pilot | | |
|---|---|---|
| Plans for Promoting Agriculture Waste Utilization Pilots | Percentage of large-scale livestock farms with waste treatment facilities<br>Percentage using straw utilization | 80%<br>85% |

## 7. Urban Planning and Construction

There is great potential for good urban design to reduce energy consumption and carbon emissions. Urban planning has to take into account factors such as population size and density, industrial structure, transportation systems, job-housing spaces, accessibility of public facilities and public space design, and these can all be used to help reduce GHG emissions. We highly recommend low-carbon cities to adopt the following principles:

1) Actions to curb carbon emissions should be consistent with the region's main functional category. Implement *Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions:*

• *By strictly controlling GHG emissions in urbanized zones for optimized development*

• *By improving control over carbon intensity in urbanized zones for focused development and accelerating green and low-carbon transformation in old industrial bases and resource-based cities*

• *By defining ecological red lines, formulating strict criteria for industrial development and restricting any new carbon-intensive projects in key ecological zones*

• *Introducing a withdrawal mechanism for those industries that clash with the functions of the development-planning zone*

Refer to the National New Urbanization Plan (2014-2020) to develop city clusters by improving the spatial layout, differentiated functions and coordination between cities and small towns.

2) Improving the mixed-use approach of urban planning. Follow the principles introduced in the *National New Urbanization Plan (2014-2020)* to better combine residential, industrial, office and commercial use.

3) Establishing an enforced urban growth boundary with highly efficient land use. The *National New Urbanization Plan (2014-2020)* suggests that cities should be developed as high intensity and mixed use and employ TOD principles. Construction land per capita should not exceed 100m$^2$. Strict requirements for new urban districts should be set to prevent urban expansion. Members of the APPC should consider carbon emission assessments before approving new urban districts.[14]

*Table 9 Key Indicators for Urban Planning*

| Year | Indicator | Target | Reference | Attribute |
|---|---|---|---|---|
| 2020 | Percentage of recycled water utilization in cities that are water scarce | 20% | Several Opinions on Further Enhancing the City Planning and Construction Management Issued by the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council | Indicative |
| 2002年发布 | Daily water usage per capita in cities (L/person•day)<br>Heilongjiang, Jilin, Liaoning, Inner Mongolia<br>Beijing, Tianjin, Hebei,Shandong, Henan, Shanxi, Shaanxi, Ningxia, Gansu<br>Shanghai, Jiangsu, Zhejiang, Fujian, Jiangxi, Hubei, Hunan, Anhui<br>Guangxi, Guangdong, Hainan<br>Chongqing, Sichuan, Yunnan, Guizhou<br>Xinjiang, Tibet, Qinghai | 80-135<br>85-140<br>120-180<br>150-220<br>100-140<br>75-125 | Residential Water Consumption (announced in 2002) | Indicative |

[14] Introduced in the National Plan on Climate Change (2014-2020)

## 8. Carbon Sinks

Key indicators for carbon sinks include green area per capita of public parks, the percentage of green areas, green area and forest coverage.

*Table 10 Key Indicators for Carbon Sinks*

| Year | Indicator | Target | Reference | Attribute |
|---|---|---|---|---|
| 2020 | Forest coverage<br>Grassland vegetation coverage | 23.04%<br>56% | The 13th Five-Year Work Plan for Controlling Greenhouse Gas Emissions<br>The 13th Five-Year Action Points on Forest Response to Climate Change | Binding<br>Indicative |
| | Woody plant coverage | 29% | National Afforestation Plan (2011-2020) | Indicative |
| | Green area per capita of public parks<br>Green area coverage in developed areas<br>Green area coverage<br>Forest coverage in towns | $11.7m^2$<br>39.5%<br>30% | National Afforestation Plan (2011-2020) | Indicative |
| **Demonstrations** | | | | |
| | Forest coverage<br>In southern cities<br>In northern cities<br><br>Forest coverage in developed areas<br>Green area coverage in developed areas<br>Green public area per capita<br>Green public area per capita in city centers<br>Forest coverage in suburbs<br>Mountainous areas<br>Hilly areas<br>Plains<br>Southern plains<br>Plant coverage of water banks<br>Percentage of local plants<br>Naturalness of urban forests | <br>>35%<br>>25%<br><br><br>>35%<br>>33%<br>$>9m^2$<br>$>5m^2$<br>>60%<br>>40%<br>>20%<br>>15%<br>>80%<br>>80%<br>≥0.5 | Evaluation Indicator System of National City Forests | Indicative |

## 9. Waste Management

About 3-4% of annual GHG emissions come from methane emitted from solid waste. Solid waste from public facilities, industrial and other sources is a major source of methane and other GHGs, such $N_2O$, NOx and CO.

Key indicators for waster management are the recycling rate, waste separation and the rate of harmless disposal for urban domestic waste. In addition, the following measures should also be adopted:

1) Establish or improve waste sorting and recycling systems. Reach the targets listed in the *Construction Plan of Harmless Treatment Facilities for Urban Household Waste in the 13th Five-Year Plan* on the effective sorting of waste in municipalities, cities with separate state planning and provincial capitals.

2) Promote harmless disposal and resource utilization of kitchen waste. Set up recycle and reuse systems for kitchen and construction waste by 2020 as outlined in *Several Opinions on Further Enhancing City Planning and Construction Management.*

3) Improve the waste disposal fee regime. Create fees that are appropriate for the local context; they should fund waste collecting, transporting and treatment costs. Quantity-based or differentiated charging rules can be considered.[15]

*Table 11 Key Indicators for Waste Management*

| Year | Indicator | Target | Reference | Attribute |
|---|---|---|---|---|
| 2020 | Recycling rate | 35% | Several Opinions on Further Enhancing City Planning and Construction Management Issued by the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council | Indicative |
| | Household garbage classification rate in key cities as requested in the Scheme for Mandatory Garbage Classification System | 90% | Scheme for Mandatory Garbage Classification System (Draft for Comment) | Indicative |
| | The percentage of waste incineration capacity in total disposal capacity of all cities (to reach clean incineration standards)<br>Eastern cities | >50%<br>>60% | Opinions on Further Strengthening Household Waste Incineration in Cities | Indicative |
| | Harmless disposal rate of household garbage in municipalities, cities under separate state planning and provincial capitals<br>Recycle and reuse rate of household garbage<br>Recycle and reuse systems for kitchen waste | 100%<br>35% | Construction Plan of Harmless Treatment Facilities for Urban Household Waste in the 13th Five-Year Plan | Indicative |

[15] Introduced in the Construction Plan of Harmless Treatment Facilities for Urban Household Waste in the 13th Five-Year Plan

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|---|---|---|---|---|
| 2020年 | Harmless disposal rate of household garbage in other cities | 95% | Construction Plan of Harmless Treatment Facilities for Urban Household Waste in the 13th Five-Year Plan | Indicative |
| | Harmless disposal rate of household garbage in counties | 80% | Construction Plan of Harmless Treatment Facilities for Urban Household Waste in the 13th Five-Year Plan | Indicative |

## 附录：政策文件名称

| 领域 | 国家级政策文件 | 发文字号 | 英文名称 |
|---|---|---|---|
| 低碳管理体系 | “十三五”控制温室气体排放工作方案 | 国发[2016]61号 | Notice of the State Council on Issuing the Work Plan for Greenhouse Gas Emission Control during the 13th Five-Year Plan Period |
| | 国家应对气候变化规划（2014-2020年） | 发改气候[2014]2347号 | National Plan on Climate Change (2014-2020) |
| | 中美气候变化联合声明 | | China-US Joint Announcement on Climate Change |
| | 强化应对气候变化行动——中国国家自主贡献 | | Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions |
| 工业 | 工业领域应对气候变化行动方案（2012－2020年） | 工信部联节[2012]621号 | Action Plan of Industries Addressing Climate Change (2012-2020) |
| | 高耗能产品能耗限额强制性标准 | | Mandatory Standards for Energy Consuming Products |
| | 高耗能行业能效领跑者制度 | | Top Runner Program for Energy Consuming Industries |
| | 低碳产品认证目录 | | Catalog of Low-Carbon Product Certification |

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| | 战略性新兴产业重点产品和服务指导目录 | | Catalog of Major Products and Services of Strategic Emerging Industries |
| | 工业绿色发展规划（2016-2020年） | 工信部规[2016] 225号 | Green Development Plan for Industry Sector |
| | 国务院关于印发《中国制造2025》的通知 | 国发[2015]28号 | Notice of the State Council on Issuing the “Made in China (2025)” |
| | 关于加强节能标准化工作的意见 | 国办发[2015]16号 | Opinions of the General Office of the State Council on Strengthening Energy Conservation Standardization (No. 16 [2015] of the General Office of the State Council) |
| 建筑 | 公共建筑节能设计标准 | | Design Standard for Energy Efficiency of Public Buildings |
| | 国家机关办公建筑和大型公共建筑节能监管体系建设实施方案 | 建科[2007]245号 | Implementation Plan for Establishing the Supervisory System for Energy Conservation in State Organ and Public Buildings |
| | 住房城乡建设部关于进一步推进可再生能源建筑应用的通知 | 财建[2011]61号 | Notice of the Ministry of Housing and Urban-Rural Development on Further Strengthening the Application of Renewable Energy in Buildings |
| | "十二五"绿色建筑和绿色生态城区发展规划 | 建科[2013]53号 | Development Plan for Green Building and Green Eco-city |
| | 关于进一步推进公共建筑节能工作的通知 | 财建[2011]207号 | Notice for Further Strengthening the Energy Conservation on Public Buildings |
| | 绿色建筑行动方案 | 国办发[2013]1号 | Green Building Action Plan |
| | 促进绿色建材生产和应用行动方案 | 工信部联原[2015]309号 | The Action Plan for Promoting Production and Application of Green Building Materials |

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| | 可再生能源建筑应用城市示范实施方案 | 财建[2009]305号 | Action Plan of Demonstration Cities for Building Integrated Renewable Energy |
| 交通 | 加快新能源汽车推广应用的指导意见 | 国办发[2014]35号 | The Guiding Opinions on Accelerating the Promotion and Application of New-energy Automobiles |
| | 关于城市优先发展公共交通的指导意见 | 国发[2012]64号 | The Guiding Opinions Prioritizing Public Transit in Urban Area |
| | 贯彻国务院《关于城市优先发展公共交通的指导意见》的实施意见 | 交运发[2013]368号 | Implementation Opinions on the “Guidance of Prioritizing Public Transit in Urban Area” Issued by the State Council |
| | 交通运输“十二五”发展规划 | 交规划发[2011]191号 | The 12th Five Year Plan for Transportation Development |
| | 城市公共交通“十三五”发展纲要 | 交运发[2016]126号 | The 13th Five Year Development Outline for Public Transit in Cities |
| | 国务院关于印发节能与新能源汽车产业发展规划(2012—2020年)的通知 | 国发[2012]22号 | Notice of the State Council on Issuing the Planning for the Development of the Energy-Saving and New Energy Automobile Industry (2012-2020)( No. 22 [2012] of the State Council) |
| | 交通运输部通知开展国家"公交都市"建设示范工程 | 交运发[2011]635号 | Notice of the Ministry of Finance, the Ministry of Industry and Information Technology and the Ministry of Transport on Improving Refined Oil Price Subsidy Policy of Urban Buses and Accelerating the Promotion and Application of New-energy Automobiles |
| 能源 | 关于印发《重点地区煤炭消费减量替代管理暂行办法》的通知 | 发改环资[2014]2984号 | Interim Measures for Alternative Management of Coal Consumption Reduction in Key Areas |
| | 加强大气污染治理重点城市煤炭消费总量控制工作方案 | 发改环资[2015]1015号 | Work plan for Enhancing the Air Pollution Control and Coal Consumption Cap in Key Cities |
| | 煤电节能减排升级与改造行动计划（2014—2020年） | 发改能源[2014]2093号 | Action Plan of Energy-Saving, Emission-Reduction, Upgrading and Retrofitting of Coal-fired Power Plants (2014-2020) |

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| | 关于印发能源行业加强大气污染防治工作方案的通知 | 发改能源[2014]506号 | Notice on Strengthening the Work Plan of Air Pollution Prevention and Control in Energy Industry |
| | 电力发展“十三五”规划 | | The 13th Five Year Plan for Power Industry Development |
| | 能源发展战略行动计划（2014-2020年） | 国办发[2014]31号 | Strategic Action Plan for Energy Development (2014-202) |
| | 全社会用电量中非水电可再生能源电力消纳量比重指标 | | Renewable Portfolio Standards for Non-Hydro Power in Total Electricity Consumption |
| | 新能源示范城市评价指标体系 | 国能新能[2012]156号 | Evaluation Indicator System for New Energy Pilot Cities |
| | 能源行业加强大气污染防治工作方案 | 发改能源[2014]506号 | Action Plan of Enhancing the Air Pollution Prevention and Control for Energy Sector |
| 农业 | 关于打好农业面源污染防治攻坚战的实施意见 | 农科教发[2015]1号 | Implementation Opinions on Preventing and Controlling the Agricultural Non-Point Source Pollution |
| | 关于推进农业废弃物资源化利用试点的方案 | 农计发[2016]90号 | Plans for Promoting the Pilots of Agriculture Waste Utilization |
| 城市规划 | 国家新型城镇化规划（2014-2020） | 国务院2014年第9号公报 | National New Urbanization Plan (2014-2020) |
| | 中共中央　国务院关于进一步加强城市规划建设管理工作的若干意见 | 中发[2016]6号 | Several Opinions on Further Enhancing the City Planning and Construction Management Issued by the the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council |
| 森林碳汇 | 林业应对气候变化“十三五”行动要点 | 办造字[2016]102号 | Action Points for Forestry Tackling Climate Change in 13th Five Year Plan |

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| | 林业发展“十三五”规划 | 林规发[2016]22号 | 13th Development Plan of Forestry |
| | 全国造林绿化规划纲要（2011-2020） | 全绿字[2011]6号 | National Afforestation Plan (2011-2020) |
| | 国家森林城市评价指标 | | Evaluation Indicator System of Nation Forest City |
| 废弃物处理 | “十三五”全国城镇生活垃圾无害化处理设施建设规划 | 发改环资[2016]2851号 | Construction Plan of Harmless Treatment Facilities for Urban Household Waste in 13th Five Year Plan |
| | 垃圾强制分类制度方案（征求意见稿） | 发改办环资[2016]1467号 | Scheme for Mandatory Garbage Classification System |
| | 新能源示范城市评价指标体系 | 国能新能[2012]156号 | Evaluation Indicator System for New Energy Pilot Cities |

# Partnerships (Pinyin sort order)

## Founding Organization

- Energy Foundation (China)

## Partners

- China Academy of Fiscal Sciences
- China Sustainable Development Institute
- China Energy Group, Lawrence Berkeley National Laboratory
- Energy Research Institute, National Development and Reform Commission
- Guangzhou Institute of Energy, Chinese Academy of Sciences
- Harvard China Project
- Huazhong University of Science and Technology
- Institute of Low-Carbon Economy, Tsinghua University
- International Institute for Sustainable Development
- National Center for Climate Change Strategy Research and International Cooperation
- Rocky Mountain Institute
- Shenzhen Low-Carbon Development Foundation
- School of Environmental and Natural Resources, Renmin University of China
- Wuhan University
- World Resources Institute
- Yuheng Sustainable Transportation Research Center
- Zhejiang Province Center for Climate Change and Low Carbon Development

# Contact us

Sina Weibo
two-dimensional code

WeChat
two-dimensional code

iGDP
Address:7-1-51, JIANGUOMENWAI DIPLOMATIC RESIDENCE COMPOUND, NO.1 XIUSHUI STREET, CHAOYANG DISTRICT, BEIJING, 100600, PEOPLE'S REPUBLIC OF CHINA
TEL:86-10-8532-3096
FAX:86-10-8532-2632
EMAIL:IGDPOFFICE@IGDP.CN