UNEP

GREEN IS GOLD

THE STRATEGY AND ACTIONS OF CHINA'S ECOLOGICAL CIVILIZATION

Citation

UNEP. (2016). Green is Gold: The Strategy and Actions of China's Ecological Civilization.

Disclaimer

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the United Nations Environment Programme concerning the legal status of any country, territory, city or area or of its authorities, or concerning delimitation of its frontiers or boundaries. Moreover, the views expressed do not necessarily represent the decision or the stated policy of the United Nations Environment Programme, nor does citing of trade names or commercial processes constitute endorsement.

Cover photo: A city park in Guiyang. © Tianhong Huang

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

AIIB	Asian Infrastructure Investment Bank
BRICS	Brazil, Russia, India, China and South Africa
B&R	Belt and Road
CCICED	China Council for International Cooperation on Environment and Development
CDM	Clean Development Mechanism
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CO_2	Carbon Dioxide
COD	Chemical Oxygen Demand
EGP	EU-China Environmental Governance Programme
EIA	Environmental Impact Assessment
$PM_{2.5}$	Fine Particulate Matters
PM_{10}	Inhalable Particulate Matters
FYP	Five-Year Plan
GDP	Gross Domestic Product
GNH	Gross National Happiness
GW	Gigawatt
INDC	Intended Nationally Determined Contribution
kWh	Kilowatt Hour
MEP	Ministry of Environmental Protection
MLR	Ministry of Land Resources
MOF	Ministry of Finance
MOHURD	Ministry of Housing and Urban-Rural Development
MW	Megawatt
NBS	National Bureau of Statistics
NGCEECTM	National Guiding Committee for Edition and Examination of Cadre Training Materials
NGOs	Non-Governmental Organizations
NDRC	National Development and Reform Commission
NH_3-N	Ammonia Nitrogen
NO_X	Nitrous Oxide
ODS	Ozone Depleting Substances
PAGE	Partnership for Action on Green Economy
PES	Payments for Ecosystem Services
PRCEE	Policy Research Centre for Environment and Economy
RMB	Renminbi (Chinese currency)
SDGs	Sustainable Development Goals
SFA	State Forestry Administration
SO_2	Sulphur Dioxide
UNEA	United Nations Environmental Assembly
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USD	United States Dollar
VOCs	Volatile Organic Compounds
WAVEs	Wealth Accounting and Valuation of Ecosystems

ACKNOWLEDGEMENTS

This report is the result of joint work by the United Nations Environment Programme (UNEP) and the Policy Research Centre for Environment and Economy (PRCEE) in China. Sheng Fulai of UNEP's Economy and Trade Branch played a leading role in initiating the report and advising on the report's content and structure with assistance from Chiara Moroni, Qu Zhengzheng, and Rowan Palmer and guidance from Steven Stone. On the Chinese side, Yu Hai, Zhang Yongliang, Wang Yong, and Han Xiaocheng are principle authors with guidance from Li Haisheng, Song Xiaozhi, and Zhang Jieqing, comments from Li Hongbing, Ge Chazhong, Zhang Huiyuan, and Li Jun, and coordination by Yang Xiaohua. The production of this report would not have been possible without the financial support from the China Council for International Cooperation on Environment and Development (CCICED).

FOREWORD

The successful adoption of the 2030 Agenda for Sustainable Development and the first universally binding climate change agreement signed in Paris in 2015 renewed hope for a bold transition towards a low-carbon economy, greater efficiency of natural resources, inclusive green economic growth and overall sustainable development. To take the next step — moving from commitment to action — countries must have an integrated approach to implementation that harmonizes environmental integrity, social inclusiveness and economic prosperity.

On this front, the United Nations Environment Programme (UNEP) has been collecting and sharing information on various national sustainable development models and tools. These include Bhutan's Gross National Happiness (GNH), Botswana's Wealth Accounting and Valuation of Ecosystems (WAVEs), Bolivia's Living Well, Costa Rica's Payments for Ecosystem Services (PES), the Circular Economy of Germany and the European Union, South Africa's Green Economy and Thailand's Sufficiency Economy.

This publication explores China's Ecological Civilization approach, a "Five-in-One" model that integrates not only the economic, social and ecological, but also the political and cultural dimensions of development. The latter two focus on changes to the behaviours of public officials and ordinary citizens, respectively.

Although the related concept and practices are familiar to Chinese people, Ecological Civilization is relatively unknown to non-Chinese speaking audiences. An earlier UNEP report, Multiple Pathways to Sustainable Development: Initial Findings from the Global South, touched on the model. The present publication, however, aims to provide the international community with more comprehensive information.

Several innovations, in particular, stand out. The designation of "main functional areas" across the country, for example, manages spatial use in accordance with the major ecological conditions of different localities. With respect to development, areas can be open, partially open or completely off limits. Within these areas, the most noticeable is the drawing of "ecological redlines" (akin to the more familiar term "planetary boundaries" at the global level). In Jiangsu Province, such redlines (for protecting ecological functions) cover more than 20 per cent of the province's territory. Another innovation is a system to hold senior officials accountable, retroactively if necessary, for the ecological conditions under their responsibility.

I hope these and other elements presented in this publication will not only help the international community better understand the commitment of the Chinese people and its government to sustainable development, but also inspire global actions on the 2030 Agenda and the Sustainable Development Goals.

Achim Steiner
United Nations Under-Secretary-General and
Executive Director, United Nations Environment Programme

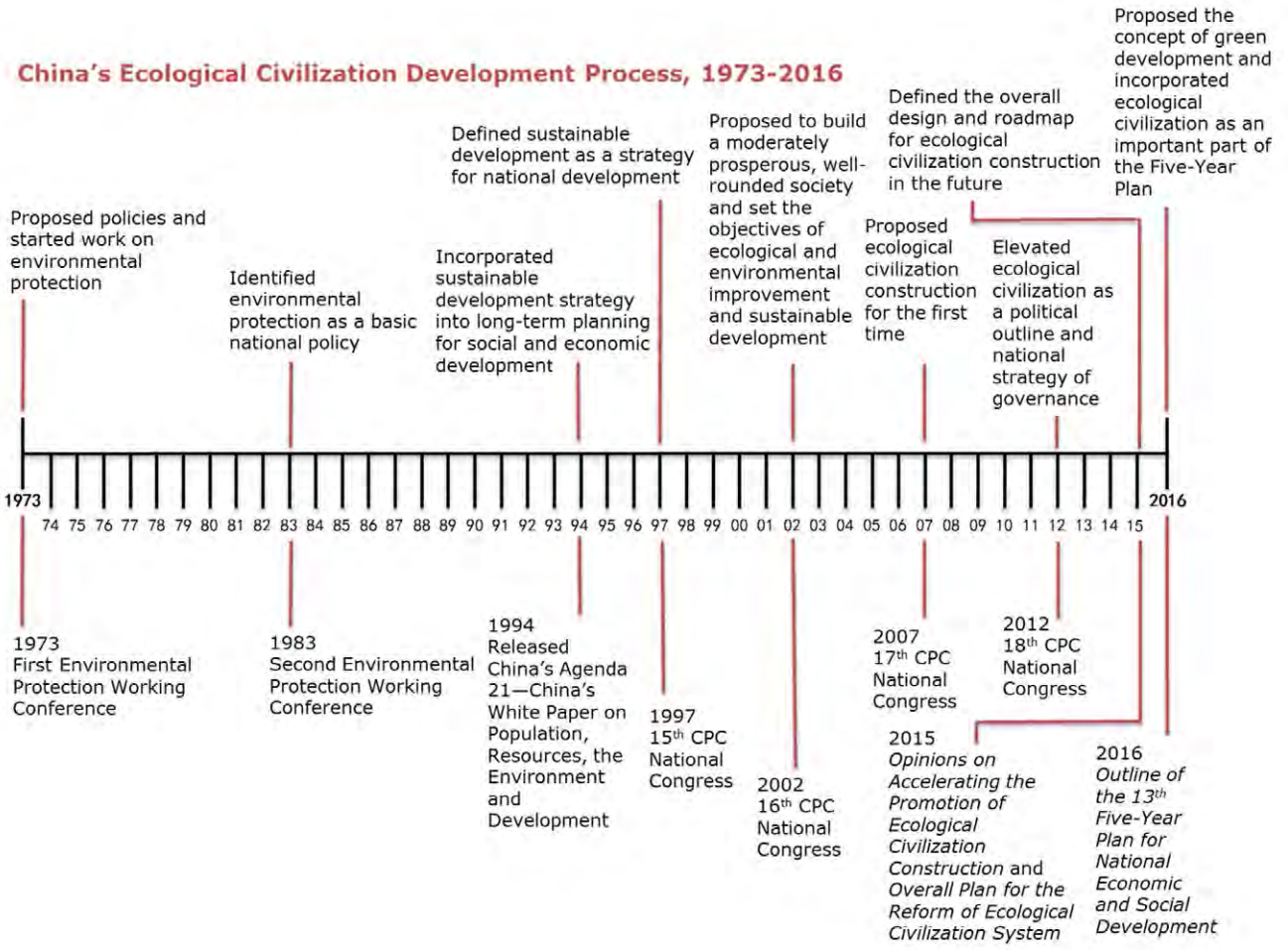
1 INTRODUCTION

Environmental protection as a fundamental national policy was confirmed in the Second National Environmental Protection Conference which was held from December 31, 1983 to January 7, 1984 in Beijing.
© Ministry of Environmental protection, P.R. China

The Chinese government has been paying close attention to ecological and environmental issues for many years. It has highlighted Ecological Civilization (or Eco-civilization for short) and environmental protection as a long-term strategy vital to the country's modernization and its people's well-being. China started framing environmental protection as a fundamental national policy in the 1980s and established sustainable development as a national strategy in the 1990s. At the beginning of the 21st century, the government proposed a "Scientific Outlook on Development" that is people-centered, fully coordinated, and environmentally sustainable. In particularly, since late 2012, the government has incorporated Eco-civilization into the "Five-in-One" blueprint of socialism with Chinese characteristics, which outlines a commitment to "innovative, coordinated, green, open and shared development". This blueprint has given great impetus to the implementation of Eco-civilization with environmental quality at its core aiming at "making the skies bluer, mountains greener, water cleaner, and the ecological environment better" (see Figure 1).

President Xi Jinping has pointed out that "green is gold" and that moving towards a new era of Eco-civilization and building a "Beautiful China" are key to realizing the "Chinese Dream" of rejuvenating the nation. Since its reform and opening-up thirty years ago, the country has seen its economy grow at an annual average of 9.8% (NBS, 2016). It has successfully transitionedfrom a low-income to a high-middle-income country with significant economic achievements, almost having reached levels of

FIGURE 1. EVOLUTION OF CHINA'S ECO-CIVILIZATION DEVELOPMENT



industrialization and urbanization that took one to two hundred years in developed countries. At the same time, however, after an extended period of extensive and high-speed economic growth, China has paid a heavy environmental price, with the emergence of problems such as soot pollution, ozone depletion, fine particulate matters ($PM_{2.5}$), and volatile organic compounds (VOCs). Pollution from different sources – production and households, urban and rural, industry and transport - appear to be intertwined with each other. To address the dilemmas between economic development and resource/environmental constraints, the government has most recently proposed a policy of pursuing green development and building an Eco-civilization, which involves management of the relationship between humans and nature in a comprehensive, scientific, and systematic manner. It embodies the "green is gold" perspective of values, development, and governance. It goes beyond and does away with the traditional development patterns and models, guiding the transformation of the production methods and the lifestyle of the entire society.

As China firmly supports and actively implements the concept and actions of sustainable development at the global level, its effort to build an Eco-civilization will make a significant contribution to the 2030 Agenda for Sustainable Development. The country's practices and experiments to promote an Eco-civilization will not only contribute to addressing its own resource and environmental challenges but also serve as demonstrations for other developing countries that may wish to avoid the dependence on, and the lock-in effect of traditional development pathways. This is conducive to promoting the establishment of a new global environmental governance system and benefitting the noble course of sustainable development for all people, men and women.

2 STRATEGIES

Qinghai Sanjiang National Nature Reserve is the birthplace of China's Yangtze River, Yellow River and Lancang River, with a total area of 0.395 million square kilometers. This region is identified as one of the country's 25 key ecological functional areas.
© Xinhua News Agency

Eco-civilization is not only an important conceptual innovation but also a key national governance strategy for China. A substantive framework has taken shape.

2.1 THE ECO-CIVILIZATION VISION

Enjoying a beautiful home with a blue sky, green land, and clean water is articulated as the dream of every Chinese and thus placed at the core of the Chinese Dream. This vision is embedded in the idea of building a "Beautiful China". To realize the vision, the government has decided to highlight the concept of Eco-civilization and incorporate it into every aspect of the country's economic, political, cultural, and social development.

By the year 2020, the overall goal of Eco-civilization is to achieve significant progress in building a resource-saving and environmentally friendly society, preliminarily completing the spatial planning of the "Areas of Principle Functions" (see Box 2-1), significantly improving the quality and benefits of economic development, and mainstreaming the values of Eco-civilization throughout the society. Specific objectives touch upon spatial development, resource use, ecological and environmental quality, and regulatory systems (see Table 1).

BOX 2-1 Areas of Principle Functions

Principle functions are each geographical area's core and representative land-use functions. As different areas differ from each other in their natural conditions and their resource/environmental carrying capacity, their development, protection, supervision, and management should also be differentiated based on their principle functions. Across its entire 9,600,000 km^2 of land area, China will establish four development categories - optimal development, targeted development, restricted development, and no development – overlaid with three principle functions: economic development in urbanized areas, agriculture in major farming areas, and ecological service inkey areas of ecological functions.

TABLE 1. ECO-CIVILIZATION TARGETS BY 2020

Targets	Contents
Further optimize spatial development	• Zoning of "Areas of Principle Functions" effectively implemented • Ecological redlines delineated and enforced • Redlines for protecting cultivated land enforced
Utilize resources more efficiently	• CO_2/GDP down by 40%-45% over 2005 level • Energy intensity further reduced • Resource productivity greatly increased • Total water consumption under 670 billion cubic meters • Water consumption/RMB10,000 of industrial added value under 65 cubic meters • Irrigation efficiency ("effective utilization coefficient of farmland irrigation water") above 0.55 • Non-fossil energy reaching approximately 15% of primary energy consumption
Improve the overall quality of ecological environment	• Total discharge of sulphur dioxide (SO_2), nitrous oxide (NO_X), chemical oxygen demand (COD) and ammonia nitrogen (NH_3-N) further declined • Air quality and water quality of key watersheds and offshore areas improved • More than 80% of the key rivers/lakes/water functional areas meeting water quality standards • Safety and security of drinking water continuously improved • Overall soil quality kept stable • Environmental risks effectively controlled • Forest coverage over 23% • Prairie's vegetation coverage 56% • Minimum wetland areas at 533,333 square kilometers • More than 50% of the reclaimable desert reclaimed • At least 35% of the natural shorelines preserved • Speed of biodiversity loss under control and stability of nation-wide ecosystems clearly enhanced
Establish major regulatory systems of Eco-civilization	• Shaping up an Eco-civilization system characterized by "prevention at source, control over the pollution process, compensation for damages, and holding those responsible to account" • Definitive achievements in developing critical systems such as the ownership and use of natural assets, ecological redlines, compensation for ecological protection, and ecological and environmental protection management

Source: State Council, 2015a.

2.2 PRIORITIES FOR BUILDING AN ECO-CIVILIZATION

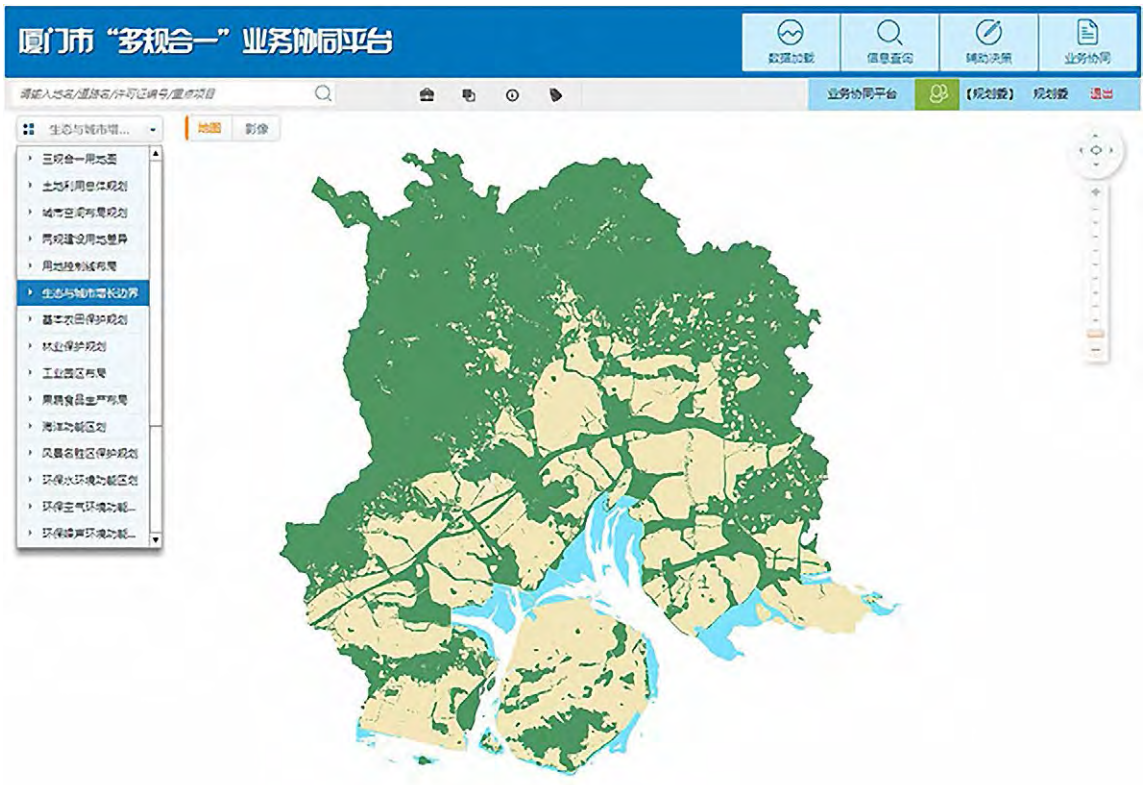
Eco-civilization's values are oriented towards the following: 1) adhering to the basic principle of giving priority to resource conservation and environmental protection and relying primarily on the natural recovery of ecosystems; 2) adhering to the basic pathway of green, circular, and low-carbon development; and 3) adhering to the approach of "making break-throughs in key areas while advancing at an overall level" with reform and innovation as the basic driving forces supported by the nurturing of an ecological culture. Following the above orientations, China's Eco-civilization is implemented across eight priority areas (see Table 2).

TABLE 2. PRIORITIES OF ECO-CIVILIZATION

Priorities	Contents
Spatial development	• Actively implement the "Areas of Principle Functions" strategy and promote the integration of diverse plans covering economic and social development, urban and rural land use, and ecological and environmental protection (see Box 2-2) • Vigorously promote green urbanization • Accelerate the development of "Beautiful Villages" • Strengthen the application of sciences to the utilization of marine resources and the related ecological and environmental protection
Technological innovation and structural adjustment	• Promote technological innovation in energy conservation, circular use of resources, development of new energy, pollution control, and ecological remediation • Adjust and optimize industrial structure and phase out outdated and excessive capacities • Develop energy conservation, environmental protection and other green industries
Resource use	• Facilitate energy conservation and emission reduction in key industries and sectors such as construction and transport • Develop a circular economy and build a society-wide system for circular use of resources • Strengthen resource conservation and implement full-cycle management for the use of water, land, minerals and other resources
Ecological and environmental protection	• Protect and restore natural ecosystems • Comprehensively promote the prevention and control of air, water and soil pollution • Proactively address climate change
Regulatory systems for Eco-civilization	• Improve laws and regulations • Improve standards for resource and energy consumption, discharge of pollutants, and environmental quality • Improve the system governing the ownership and use of natural assets • Improve regulations covering pollution permits, pollution caps for enterprises and public institutions, environmental impact assessment (EIA), clean production audits, and environmental information disclosures • Delineate and strictly observe ecological redlines • Improve economic policies including pricing, taxation and financing • Promote market-based mechanisms such as energy management contracts, the trading of energy savings, carbon emission rights, water rights, and pollution rights, and the "third-party treatment" of environmental pollution (i.e. outsourcing environmental treatment).

	• Improve transfer payments to key areas of ecological functions and inter-regional "horizontal" compensatory payments for ecological conservation services • Establish a system for target setting, an approach to performance evaluation and a "reward and punishment" mechanism; compile balance sheets for natural assets; and implement a system of retroactive auditing on natural assets and environmental responsibilities for relevant ex-officials • Improve the accountability system
Monitoring and supervision	• Establish a system for evaluating the achievements of targets in building an Eco-civilization and improve the ability to collect statistics, monitor and account for all natural resources and environmental factors • Implement round-the-clock monitoring of natural resources and ecological environment • Strengthen legal and administrative supervision, intensify investigations, and strictly punish violations of environmental laws and regulations
Public participation	• Raise awareness of Eco-civilization • Cultivate green lifestyles • Encourage public participation
Organization and implementation	• Intensify integrated planning and coordination of governments at all levels and across departments • Identify effective models of building an Eco-civilization in different regions • Accelerate the building of an Eco-civilization with a global perspective and strengthen exchanges and practical cooperation with other countries on issues of relevance to Eco-civilization • Encourage governments at all levels to formulate plans to implement Eco-civilization and ensure that all policies and measures are put in place

Source: State Council, 2015a.



Xiamen City of Fujian Province is one of the "All-In-One" pilot cities. An "All-In-One" online platform has been established since January 1, 2015 for facilitating the city's spatial management.
© Xiamin Municipal Commission of Urban Planning

BOX 2-2 "All-In-One" Piloted in 28 Cities and Counties

After three decades of efforts, China has preliminarily established a spatial planning system focusing on the overall planning of land use, urban and rural planning, and regional planning. The system has played an important role in the country's industrialization and urbanization. There is still, however, a lack of spatial planning at a more basic level. Plans formulated by different departments follow their respective systems and tend to conflict with each other with little inter-linkages. It is also common that local planning is poorly integrated with planning at a broader scale, is based on inadequate scientific evidence and is subject to modifications at will. These problems have exacerbated the disordered spatial development and intensified the shortage of water and soil resources, ecological damage, and environmental pollution.

To address these issues, the government has proposed to unify national spatial planning by integrating different spatial plans into a comprehensive spatial blueprint for sustainable development. The proposal would unify the spatial planning at the city and county levels and achieve the "All-In-One" integration of: 1) economic and social development plans; 2) urban and rural plans; 3) land utilization plans; and 4) ecological and environmental protection plans. There is to be only one single plan and single blueprint for each city and each county. In the planning, efforts will be made to designate the space for production, residential areas, and ecological conservation, defining boundaries for urban development, industrial zones, and rural residential areas, as well as the boundaries for protecting cultivated land, woodland, prairie, rivers, lakes, and wetlands.

In August 2014, the National Development and Reform Commission (NDRC), the Ministry of Land Resources (MLR), the Ministry of Environmental Protection (MEP), and the Ministry of Housing and Urban-Rural Development (MOHURD) launched "All-In-One" pilots in 28 cities and counties. They are expected to improve the government's capability in spatial management and control, contributing to the intensive (as opposed to extensive), efficient, and sustainable use of land space. They also serve as an important foundation for reforming government planning by establishing a consistent, complementary, and coordinated spatial planning system.

Source: NDRC et al., 2014.

3 ACTIONS

A $PM_{2.5}$ monitoring station in Beijing City.
© Deng Jia/China Environment News

3.1 PROMOTING GREEN DEVELOPMENT

China has established targets and indicators for natural resources and the environment in its national economic and social development plans. There were 8 related indicators in the 12th Five-Year Plan (FYP) covering 2011-2015, accounting for 33.3% of all the indicators compared to 7 and 27.2%, respectively, in the 11th FYP (2006-2010). The 12th FYP specified that by 2015, non-fossil energy should account for 11.4% of primary energy consumption, that energy consumption per unit of GDP should drop by 16%, and that CO_2 emission per unit of GDP should decline by 17% over the 2010 levels (see Table 3).

TABLE 3. TARGETS AND INDICATORS IN THE 12TH FIVE-YEAR PLAN

Indicators	Targets		Achievements	
	2015	Annual Average Growth (Cumulative)	2015	Annual Average Growth (Cumulative)
Economic development				
(1) GDP (Trillion USD)	—	7%	10.46	7.8%
(2) Value added of service industry (% of GDP)	47	—	50.5	—
(3) Urbanization rate (% of regular residents in urban areas)	51.5	—	56.1	—
Technology and education				
(4) Nine-year compulsory education consolidation rate (% of students graduated over the enrolled)	93	—	93	—
(5) Gross enrollment rate of high school and secondary vocational education (% of the enrolled over the eligible)	87	—	87	—
(6) Research and Development expenditure (% of GDP)	2.2	—	2.1	—
(7) Patents per 10,000 people (piece)	3.3	—	6.3	—
Resources and environment				
(8) Cultivated land (square kilometers)	1,212,000	—	1,243,333	—
(9) Reduction of water consumption per unit of industrial added value (%)	—	[30]	—	[35]
(10) Irrigation efficiency ("effective utilization coefficient of agricultural irrigation water")	0.53	—	0.532	—
(11) Share of non-fossil energy in primary energy consumption (%)	11.4	—	12	—
(12) Reduction of energy consumption/ GDP (%)	—	[16]	—	[18.2]
(13) Reduction of CO_2 emission/ GDP (%)	—	[17]	—	[20]
(14) Reduction of total emission of major pollutants (%)				
COD SO_2 NH_3-N NO_X	—	[8] [8] [10] [10]	—	[12.9] [18.0] [13.0] [18.6]
(15) Forest growth Forest coverage (%) Forest stock (100m m^3)	 21.66 143	—	 21.66 151	—
Livelihoods				
(16) Urban per capita disposable income (RMB)	—	>7%	—	7.7%
(17) Rural per capita net income (RMB)	—	>7%	—	9.6%
(18) Urban registered unemployment rate (%)	<5	—	4.05	—
(19) Urban newly increased jobs (10,000)	—	[4500]	—	[6431]
(20) Urban population covered by basic pension schemes (100m People)	3.57	—	3.77	—
(21) Coverage of urban and rural medical insurances (%)	—	[3]	—	[>3]

(22) Urban low-income housing (10,000 units)	—	[3600]	—	[4013]
(23) Total nation-wide population (100m people)	<13.90	—	13.75	—
(23) Average life expectancy (years)	74.5	—	76.34	—
Note: (1) Growth of GDP and resident income is calculated in real prices whereas their absolute values are in current prices. (2) Cultivated land for 2015 is updated according to the data of the Second Nationwide Land Survey. (3) Number in [ ] is cumulative for 5 years.				

Source: State Council, 2016.

In April 2015, the government proposed the building of an Eco-civilization by promoting – in a coordinated manner–new industrialization, information technology, urbanization, agricultural modernization, and green development. Of these, green development is a new element, which is to integrate the intensive (as opposed to extensive) use of resources and energy as well as environmental protection into the rest of the development process. Chapter 5 "Outlook" will present the content of the 13th FYP (2016-2020), which further illustrates the concept of green development.

To achieve the above-mentioned targets on schedule, the government has taken a series of actions to promote the intensive (as opposed to extensive) use of resources and energy conservation. For instance, the government has enforced – to the fullest extent – the water regulations, farmland protection regulations, and environmental regulationsin addition to promoting energy savings and industrial structural adjustment.

3.1.1 Enforcing water regulations

This measure includes: 1) strict control over total water consumption and the centralized allocation of water resources; 2) promotion of a water-saving society and upgrading of water-saving technology; 3) strict control over the total volume of pollutants discharged into rivers and lakes and systematic protection and restoration of water ecosystems; and 4) and incorporation of indicators – covering the development, use, conservation and protection of water resources into the comprehensive assessment system of local economic and social development.

Danjiangkou Reservoir is located in the upstream of Hanjiang River, it is the largest artificial lake in Asia and the main water source of China's South-to-North Water Transfer Project.
© Xinhua News Agency

3.1.2 Enforcing farmland protection regulations

This measure includes: 1) strict control over the conversion of cultivated land into non-cultivated land; 2) implementation of a system that charges for occupying farmland for non-farming purposes; 3) strict protection of essential farmland; and 4) promotion of land development, reclamation, and consolidation.

3.1.3 Enforcing environmental regulations

This measure includes: 1)the establishment of an environmental governance system in which governments, enterprises and the public are involved in accordance with the principle of "strict prevention at the source, strict control over the pollution process, and strict punishment of the consequences"; 2) continuous strengthening of environmental laws; 3) improvement to the environmental warning system; 4) the establishment of a pollution permit system covering all enterprises with fixed sources of pollution; 5) improvements to the market system for environmental protection and the system of environmental information disclosure.

3.1.4 Enforcing energy-saving and structural adjustment

This measure includes strict enforcement of energy conservation in targeted enterprises and energy-saving assessment of new projects in high energy-consuming industries, the construction industry, and industries experiencing excessive capacity. In 2014, 320 projects were assessed resulting in the reduction of energy consumption from the source by the equivalent of approximately 1.5 million tons of standard coal (NDRC, 2015). The implementation of key energy-saving projects is also noteworthy. From 2012 to 2014, the central government spent USD 1.41 billion[1] on 3,911 projects ranging from the development and commercialization of energy-saving technologies to capacity-building for energy-saving monitoring agencies, saving an equivalent of approximately 28 million tons of standard coal (NDRC, 2013; NDRC, 2014; NDRC, 2015).

Mandatory energy-saving standards have been imposed on new buildings in urban areas across China. By the end of 2014, the country had constructed 10.5 billion square meters of energy-saving buildings in urban areas, accounting for approximately 38% of the area for urban residential buildings, thus potentially saving the equivalent of 100 million tons of standard coal each year. By June 2015, 3,241 buildings had acquired green building labels, covering a total area of more than 370 million square meters (NDRC, 2015). The standard that limits the fuel consumption of road transport vehicles is also strictly enforced and new-energy vehicles are developed. From 2011 to 2015, China produced 8,400, 12,600, 17,500, 83,900 and 379,000 new-energy vehicles each year[2], a 45-fold increase in five years. The *Energy Development Strategy Action Plan 2014-2020* is implemented to reduce and substitute coal consumption and lower the share of coal in energy consumption. In addition, the Beijing-Tianjin-Hebei-Shandong Region, the Yangtze River Delta, and the Pearl River Delta have capped the coal consumption at the respective regional level. Use of clean fossil energy is also being strengthened while the share of natural gas in primary energy consumption is increasing. Renewable energy resources such as solar power, wind power, and hydropower are being developed. Thermal power facilities are being upgraded. In 2014, almost all new thermal power facilities were equipped with large units at 600 MW or above and the thermal power units at 300 MW or above accounted for 75.1% of all. China's thermal power facilities at or above 6 MW consume an equivalent of 319 grams of standard coal per kWh, reaching an internationally advanced level (NDRC, 2015).

Energy-efficient residences in the rural area of Beijing City.
©Deng Jia/China Environment News

3.2 MODERNIZING THE ENVIRONMENTAL GOVERNANCE SYSTEM AND GOVERNANCE CAPACITY

By building a systematic and standard incentive mechanism, the government seeks to accelerate the modernization of its ecological and environmental governance system as a way to provide lasting impetus and assurance for promoting green development and building a "Beautiful China". This is particularly reflected in the strengthening of environmental rule of law, improvements to the environmental protection system, and promotion of multi-stakeholder participation in environmental governance.

3.2.1 Strengthening the environmental rule of law

Since the 1980s, the Chinese government has amended or enacted basic laws such as the *Constitution, General Rules of Civil Law, Property Law, Tort Liability Law* and *Criminal Law* and integrated a group of environmental regulations into these laws. With respect to environmental protection, the government has enacted 12 laws, including the *Environmental Protection Law, Marine Environment Protection Law, The Law on the Prevention and Control of Water Pollution* and *the Law on the Prevention and Control of Air Pollution,* thereby establishing a comprehensive system of environmental protection laws (CCICED, 2015). The country's environmental legislation has been reinforced since the new *Environmental Protection Law* came into force on January 1, 2015. As the country's most fundamental and comprehensive law in the environmental field, the newly amended *Environmental Protection Law* achieved a number of breakthroughs and innovations, including:

- Clarification of the concept of building an Eco-civilization in relation to sustainable development;
- Specification of environmental protection as a basic national policy as well as the articulation of environmental protection principles as "protection first, prevention at the core, comprehensive treatment, public participation, andaccountability for damages";
- Improvement to regulations covering environmental monitoring, EIA and the capping of major pollutants with additional regulations on pollutant permits and ecological redlines;
- Increase of the responsibilities of governments at all levels for environmental protection, including improving environmental quality, increasing environmental expenditure, and strengthening environmental communication;
- Increase of the environmental protection responsibilities of enterprises, public institutions, and other producers and operators, and imposing daily fines on enterprises that illegally discharge pollutants;
- Specification of citizens' rights to the environment as well as obligations for environmental protection, including "public interest" environmental litigations.

In addition to the new *Environmental Protection Law,* there are also other relevant laws and regulations. For instance, the amended *Law on the Prevention and Control of Air Pollution came* into force on January 1, 2016 and the formulation of, or revision to the *Law on the Prevention and Control of Water Pollution,* the *Law on the Prevention and Control of Soil Pollution* and the *Nuclear Safety Law* is included in the Five-Year Legislation Plan of the National People's Congress. Moreover, the *Environmental Impact Assessment Law, the Law on the Prevention and Control of Environmental Pollution by Solid Waste, Management Regulation for Environmental Protection in Construction Projects, Pollutants Discharge License Regulations, Environment Monitoring Regulations,* and *Hazardous Wastes*

Business Certificate Management Measures are all being formulated or amended.

China's enforcement of environmental laws is being continuously strengthened. The MEP designated 2015 as the "Year of Implementing the New *Environmental Protection Law*" and issued an implementation plan with detailed tasks, division of work, and specific measures. After the launch of the consecutive daily fines decision by MEP in January 2015, the progress of enforcement has been remarkable. By the end of November 2015, consecutive daily fines had been imposed in 611 cases (160 cases by April 2015) with the payment of fines reaching over USD 74.93 million (17.30 million by April 2015); closures and detention had been applied to 3,697 cases (1,186 cases by April 2015), and production cuts and bans in 2,511 cases (698 cases by April 2015). Across China, 1.58 million enterprise-times have been investigated, of which 51,000 were punished for illegal discharge of pollutants and 73,400 for illegal launch of projects. The MEP has organized a comprehensive inspection in 33 cities/regions and urged local governments and relevant organizations to fulfill their environmental responsibility (Chen, 2016a; MEP, 2015a).

Beyond legislation and enforcement, the country has also achieved progress in its environmental judiciary. The Supreme People's Court and the Supreme People's Procuratorate have released judicial interpretations of criminal cases related to environmental pollution, and the Supreme People's Court has promulgated explanations of issues concerning the laws applicable to environmental civil public-interest lawsuits and environmental tort liability dispute cases, establishing a mechanism for coordinating administrative enforcement and criminal enforcement. Moreover, the Supreme Court has established 382 environmental tribunals, collegiate benches, and circuit courts in 18 provinces by 2014. In 2013, environmental protection departments at all levels submitted 706 suspected pollution crime cases to the public security organs, representing more than the sum submitted during the previous ten years. In 2014, environmental departments submitted 2,180 environmental criminal cases, more than two times the previous year (Tong, 2015). From January to November 2015, 1,732 administrative detention cases and 1,478 suspected pollution criminal cases were registered across the country (Chen, 2016a).

Inspection of the online monitoring devices in an enterprise.
© Deng Jia/China Environment News

BOX 3-1 Ecological Compensation at the Upstream of the Xin'an River

The Xin'an River is the third-largest river system (following the Yangtze River and the Huaihe River) in Anhui Province and the largest river flowing into Zhejiang Province. It runs across an area of 11,674 square kilometers and its main stream stretches as long as 359 kilometers, most of which are located in Huangshan City's 7 districts (or counties) and in Xuancheng City's Jixi County. The Xin'an river's upstream water quality largely determines the quality of the downstream Qiandao Lake.

At the end of 2010, the Ministry of Finance (MOF) and the MEP launched the first trans-provincial river-basin ecological compensation pilot at the Xin'an River watershed. The parties concerned agreed to allocate USD 77.24 million into a compensation fund, with 44.35 million from the central government, 15.45 million from the Anhui Provincial Government and - if the water flowing out of Anhui Province meets the quality standard - 15.45 million from the downstream Zhejiang Province. In implementing the pilot, the Anhui Provincial government adjusted the performance evaluation system for leading officials of Huangshan City by shifting the focus from GDP to indicators of ecological protection and modern services. By the end of 2013, 156 ecological compensation projects had been implemented in Huangshan City, 93 of which were completed. Monitoring data indicate that in 2013, the water of the Xin'an River at the provincial boundary passed the quality assessment and was better than the 2008-2010 average. The Xin'an River's water quality is now among the best in the country.

Source: Pan, Q. and Bi C., 2014.

3.2.2 Improving the environmental protection system

The building of an Eco-civilization requires the establishment of a comprehensive system that implements to the fullest extent the regulations on "protection at source, compensation for damages, and investigation of responsibilities". It also requires improvements to the systems of environmental governance and ecological remediation, thereby protecting the ecological environment through regulatory systems. With respect to the environmental protection system, China's "regional joint prevention and control mechanism" has been steadily improved, the "regional air-pollution coordination mechanism" has been established in key regions such as the Beijing-Tianjin-Hebei Region, the Yangtze River Delta, and the Pearl River Delta, and the "water-pollution coordination mechanism" is being set up (see Box 3-1). The fee-based use and trading of pollution rights has been piloted in 11 provinces, reaching more than USD 1.17 billion in fees and the value of trade combined, playing an important part in optimizing environmental resource allocation and reducing the amount of pollution.

The MEP, NDRC, and China's financial supervision bodies have jointly launched Measures for Evaluating Enterprises' Environmental Creditworthiness (for trial implementation) to improve the green credit information-sharing mechanism in 2014. Furthermore, efforts have been made to promote the conversion of environmental protection fees into taxes. The Environmental Protection Tax Law is openedfor public consultation in 2015. Mandatory liability insurance for environmental pollution has been piloted. From 2007 till the end of the third quarter of 2015, more than 45,000 enterprises were insured. Insurance companies have accumulatively set aside more than USD 15.45 billion to coverenvironmental risks (MEP, 2015b).

3.2.3 Promoting multi-stakeholder environmental governance

The building of an Eco-civilization requires mobilizing the active participation of the public. The most fundamental approach is to strengthen Eco-civilization education, transform society's values, and promote a shift towards sustainable and green lifestyles. In November 2015, the MEP

BOX 3-2 Public Participation in Environmental Protection: the Jiaxing Model

The Jiaxing Model began in Jiaxing City, Zhejiang Province, a successful demonstration of public environmental participation in urban areas. In this model environmental civil society organizations support local governments in environmental decision-making. Supported by the EU-China Environmental Governance Program, the model has been replicated in another 10 cities in Zhejiang Province. The model's major attributes include:

- Large-scale environmental protection: building a government-enterprise-public environmental governance platform;
- Joint actions: environmental departments take actions together with other government agencies and civil society organizations, in a cooperative, coordinated and cross-cutting relationship;
- Round-tables: inviting stakeholders to have open discussions and reach consensus through communication;
- Environmental jurors: Recruiting public representatives (experts and lawyers) to participate – in their personal capacity - in evaluating environmental administrative penalty cases, with the collective opinions of these "jurors" as an important basis for making final decisions;
- Letters of apology: if rectification is not achieved within the prescribed time, enterprises with poor environmental creditworthiness should publish a letter of apology in newspaper;
- Spot checks: in environmental enforcement, public representatives conduct spot checks on enterprises, make direct inquiries, engage in discussions on the state of environmental management and pollutant discharge, and put forward their suggestions for measures to be taken.

Source: EGP, 2015.

The launch conference of local-level partnership projects of EU-China Environmental Governance Programme.
© Jiaxing Municipal Environmental Protection Bureau

launched the Practical Guidance on Accelerating the Promotion of Green Lifestyles, which proposes measures for cultivating green lifestyles. The first such measure is to propagate the concept of green lifestyles, communicating to the public the concept and policies of building an Eco-civilization, raising the public's awareness of social responsibility, and making people recognize the importance of adopting green lifestyles. The second measure is to implement relevant policies. On the one hand, it is important to guide enterprises to adopt advanced concepts for product design, use environmentally friendly raw materials, and improve clean production for the greening of production, transportand recycling. On the other hand, it is important to guide the public to choose green products and green travel. The third measure is to engage in a diverse range of activities to promote green lifestyles, such as establishing a "citizens' green lifestyle action system" (see Box 3-2), conducting Eco-civilization education campaigns, and building a service information platform as well as an action network platform for green living (MEP, 2015c).

The building of an Eco-civilization also requires the public to participate directly in monitoring environmental pollution and ecological damage. As early as 2010, the MEP issued the *Guidelines on Cultivation and Guiding Orderly Development of Environmental Non-Government Organizations.* In July 2015, the Ministry released the *Measures on Public Participation in Environmental Protection,* further clearing the participating venues and facilitating public participation in an orderly and lawful manner. China now has nearly 6,000 organizations classified as existing for the purpose of "ecological and environmental protection" and nearly 700 registered environmental NGOs. These organizations have played an effective role in propagating, guiding, and promoting public participation (Chen, 2015).

In recent years, government environmental departments have actively publicized information on: 1) the quality of air and water, which has an important bearing on people's livelihoods ; 2) the names of major polluting enterprises ; and 3) the results of EIA,related government commitments and decisions, as well as the profiles of EIA agencies and personnel . In 2014, the MEP received 83,000 reports of violations of environmental laws and regulations, nearly 1.7 times those in 2010. In June 2015, the Ministry launched the "12369 WeChat" online platform for reporting on environmental violations. By the end of 2015, the platform had received and processed 13,000 reports. The growing number of environmental reporting reflects the awakening of the public's environmental awareness (Chen, 2015).

3.3 INTENSIFY POLLUTION CONTROL

Since the 12th Five-Year period, China has taken environmental protection as an important means to promoting green development and as a fundamental instrument for building an Eco-civilization. It has taken a number of actions targeting at the most significant environmental problems:

3.3.1 Prevention first

Prevention is the first principle of environmental protection. China's environmental risk prevention measures include EIAs, strengthening environmental standards, adjusting the industrial structure, and prevention and control of environmental risks.

Environmental impact assessments are conducted mandatorily for all regional strategic planning and construction projects, and it is the precondition of the commencement of any development projects. EIAs predict and evaluate the potential environmental impacts of regional development strategies (including areas such as water, solid waste, soil, air, acoustic environment, energy and mineral resource, climate, as well as cultural heritage and the natural landscape), various development programmes, and investment projects, and, on that basis propose preventive and flanking measures. They are an important tool for optimizing industrial structure and deployment and minimizing the chance for policies and projects to commit environmental errors. The MEP has completed EIAs of five regional development strategies (the Pan-Bohai Coastal Region, the Coastal Beibu Gulf Economic Zone, the Chengdu-Chongqing Economic Zone, the Western

Hangzhou City, A Cement factory is transformed into a cultural and creative industrial park.
© Policy Research Center for Environment and Economy, MEP, P.R. China

Coast of Taiwan Straits Economic Zone and the Energy and Chemical Industry Zone in the Upper and Middle Reaches of the Yellow River), as well as the strategies for developing the Western and Regions of China. These assessments cover nearly 180 cities and prefectures in 25 provinces (5.05 million square kilometers, more than half of the country's land territory) with 713 million peopleand GDP of USD 2.68 trillion. Government environmental departments at all levels have conducted more than 4,000 EIAsof development programmes over 300 of which at the national level. As far as development projects are concerned, at the national level, 1,164 EIA documents have been endorsed while 153 projects rejected involving a total investment of more than USD 117.41 billion,implicating sectors such as transport, electric power, steel and nonferrous metal, coal and chemical engineering, and petrochemical industries (Chen, 2015).

In order to reach the targets for environmental quality, standards have been established focusing on limiting the discharge of pollutants. They serve as the basis for approving the results of EIAs and for routine monitoring of environmental conditions. Since the 12th Five-Year period, China has established 493 national environmental standards, including 46 national pollution discharge control standards for key sectors such as thermal power, iron and steel, and cement, imposing stricter limits on key sectors in key regions (Chen, 2016a). These standards have been important for promoting technological innovation and the technological transformation and upgrade of enterprises.

To adjust the industrial structure, China is now addressing surplus capacity and phasing out outdated capacity. Between 2011 to 2014, the country eliminated 155 million tons of steel production capacity, more than 600 million tons of cement production capacity, and 32.66 million tons of paper-making capacity, representing 1.6, 1.6, and 2.2 times the respective targets set in the 12th FYP. The energy-saving and environmental protection industry grows at a rate of 15% to 20% per year, accounting for over 6.5% of GDP (Chen, 2016a).

To control risks in key environmental fields, the central government has spent USD 2.67 billion in the 12th Five-Year period to deal with heavy metal pollution in key regions. Almost seven million tons of decades-old chromium slag have been disposed of (Chen, 2016a).

3.3.2 Declaring war against pollution

The government has stated that a war must be waged against pollution, as was doneagainst poverty. It has launched the *Action Planon Prevention and Control of Air Pollution* ("*Air Action Plan*") and the *Action Plan on Prevention and Control of Water Pollution* ("*Water Action Plan*"), which aim to strengthen environmental governance.

According to the *Air Action Plan*, inhalable particle concentration in cities at the prefectural level and above must drop by 10% or more from the level in 2012 and the number of days with good air quality should increase each year. Fine particulate matter concentration must drop by approximately 25% in the Beijing-Tianjin-Hebei Region, 20% in the Yangtze River Delta, and 15% in the Pearl River Delta. The annual average concentration of $PM_{2.5}$ in Beijing must be controlled at approximately 60 μg/m^3. Thirty-five measures are proposed to be used to assist achieving these targets, including:1) comprehensive treatment of air pollution; 2) industrial transformation and upgrading; 3) accelerating technological innovation; 4) adjusting the energy structure; and 5) strict monitoring and regulation. The focus is on the control of $PM_{2.5}$ and inhalable particulate matters

BOX 3-3 Air Pollution Control in Lanzhou

As the capital of Gansu Province, Lanzhou is dominated by heavy and chemical industries. In recent decades, the city has suffered from chronic air pollution caused by the combination of geographical and meteorological conditions, monolithic energy structure, industrial structure, dust and other factors. From 2009 to 2011, Lanzhou was successively ranked at the bottom for air quality in China and was even identified as one of the worst air polluting cities in the world.

Since 2013, the city government of Lanzhou has placed air pollution control on the top of its agenda and required the signing of accountability agreements between different levels of administration, thereby making a clear commitment to its people. It has implemented eight pollution-control projects, namely: 1) environmental legislation; 2) industrial emissions reduction; 3) coal-burning reduction; 4) motor vehicle exhaust standards; 5) dust control; 6) ecological forestry; 7)clean and refreshing air; and 8) improvement to environmental monitoring capacity.

As a result, Lanzhou has become a city with the most rapidly improving air quality in China. In 2014, there were 71 more days with good air quality than in 2012. "Good air", in turn, has brought visitors and business opportunities. In 2013, Lanzhou was ranked the fourth in GDP growth among the country's provincial capital cities, received 30% more tourists, and attracted more than 70% growth in investments.

Source: Chen, 2015.

(PM_{10})(State Council, 2013).

Since 2015, China has: 1) started comprehensive treatment of volatile organic compounds used by the petrochemical industry; 2) phased out 1.17 million "yellow-label" (below-standard) cars; 3) made higher quality gasoline and diesel (for automobile use) available (i.e. National Standard IV across China and National Standard V in some regions); 4) analyzedthe sources of the polluting atmospheric particulates in 22 key cities; and 5) established inter-regional joint prevention and control mechanisms in the Beijing-Tianjin-Hebei Region, the Yangtze River Delta, and the Pearl River Delta (see Box 3-3).

As far as the *Water Action Plan* is concerned, it is stipulated that by 2020: 1) more than 70% of the water bodies in seven key watersheds including the Yangtze River, the Yellow River, and the Pearl River should reach good quality overall; 2) the urban "black and odorous" water bodies should be controlled below 10%; 3) more than 93% of urban drinking water sources should achieve good quality overall; and 4) the proportion of extremely poor quality underground water sites under monitoring should be controlled at approximately 15%.

The Plan further requires that by 2030, more than 75% of the water bodies in the seven key watersheds should achieve good quality overall, urban "black and odorous" waters should be eliminated comprehensively, and approximately 95% of the urban drinking water sources should achieve good quality overall.

The Plan has also specified 238 measures, covering ten aspects: 1) pollution control; 2) economic restructuring and upgrading; 3) water conservation and protection; 4) technological support; 5) market-based mechanisms; 6) law enforcement; 7) water management; 8) safeguarding water ecosystems; 9) specification and fulfillment of responsibilities by all parties concerned; and 10) public participation and monitoring (State Council, 2015b).

Since 2015, the central government has ear-marked USD 2.01 billion for water pollution prevention and control. This has facilitated the establishment and improvement of compensation mechanisms for protecting water ecosystems such as the Xin'an River.

It has also contributed to increasing the number of nation-wide surface-water monitoring sites to 2,700 assessing and testing water quality as required by the Plan (Chen, 2016a).

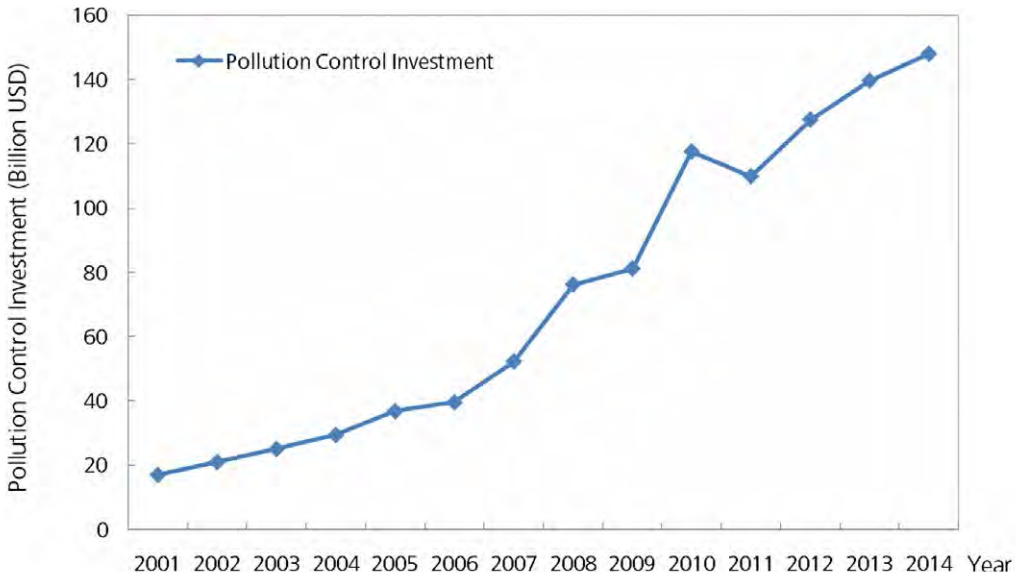
The country is also accelerating the formulation of the *Action Plan on Prevention and Control of Soil Pollution* (*Soil Action Plan*) and has launched soil pollution treatment and restoration pilot projects in 10 provinces including pilot programs to monitor pollution sites in regions such as Hunan, Chongqing, and Jiangsu. In addition, the government has audited the disassembling of 69 million discarded electric appliances and electronic products. The fiscal support for the disassembling amounts to USD 820 million (Chen, 2016a).

3.3.3 Enhancing the capacity of pollution control

China is constantly increasing investments in pollution control, with the total value of such investments growing from USD17.10 billion in 2001(MEP, 2002) to USD 147.93 billion in 2014(MEP, 2015d). Between 2011-2014, investments in pollution control amounted to USD 508.16 billion (see Figure 2).

China has built up the largest air-quality monitoring network in the developing world. 338 Chinese cities at the prefectural level and above are capable of monitoring six types of indicators covering $PM_{2.5}$, among others. The daily capacity to treat urban waste water rose from 52 million tons in 2005 to 175 million tons, making China one of the leading countries in waste water treatment capacity. Of the total installed thermal power capacity, the shares of thermal power units installed with desulfuration and denitration devices increased from 82.6% and 12.7% in 2010, to 96% and 87% in 2015, respectively. Thermal power units with a total capacity of 84 GW have been transformed to achieve ultra-low emissions, approximately accounting for 10% of the country's total installed thermal power capacity. Additionally, units with more than 81 GW are going through the transformation (Chen, 2016a).

FIGURE 2. CHINA'S INVESTMENT IN POLLUTION CONTROL 2001-2014



Source: MEP, 2015d.

A sewage treatment plant in Nanjing City, with 200 thousand tons sewage treatment capacity per day.
© Deng Jia/China Environment News

3.4 PROTECTING ECOSYSTEMS AND RURAL ENVIRONMENT

Since the start of the 12th Five-Year period, China has intensified efforts to build capacity for implementing multilateral conventions on biodiversity conservation and biosafety management. Meanwhile, it has been strengthening efforts to restore damaged ecosystems and improve rural environment. Demonstration sites for building an Eco-civilization have been created to promote the protection of ecosystems and rural environment in a systematical and holistic manner.

3.4.1 Drawing of ecological redlines

Ecological redlines or eco-redlines refer to the strictly controlled boundaries legally drawn for key areas of ecological functions and ecologically sensitive or fragile areas. Areas encircled by redlines are "eco-redline areas". They are important for defending ecological security, safeguarding ecosystem functions and supporting sustainable socioeconomic development (MEP, 2015e). The access to such protected areas is strictly controlled. During the 12th Five-Year period, the Chinese government actively promoted the delineation of eco-redlines, formulated technical guidelines, and established pilot programs in Inner Mongolia, Jiangxi, Guangxi, and Hubei. In 2015, 28 provinces/autonomous regions/cities prioritized drawing eco-redlines as a major task. Of these, Jiangsu and Tianjin have published and enforced their respective eco-redlines whereas Hainan, Hubei, Shanghai, and Shenyang have formulated plans for eco-relines (see Box 3-4).

3.4.2 Strengthening biodiversity protection

China has one of the highest levels of biodiversity in the world and ranks third in the number of higher plants species. It also hosts 13.7% of the world's vertebrate species, and hundreds of endemic animal species including the panda, the Crested Ibis, the golden monkey, the South China tiger, and the Yangtze alligator. China has set up the National Committee for Biodiversity Conservation, launchedthe Biodiversity Conservation Strategy and Action Plan 2011-2030 and the United Nations Decade on Biodiversity: China Action Plan, participated proactively in negotiating the Convention on Biological Diversity and Cartagena Protocol on Biosafety, completed and submitted the Third National Report onCartagena Protocol on Biosafety, and proactively promoted the signing of the Nagoya

BOX 3-4 Delineation of Eco-redlines in Jiangsu

With a relatively developed economy, Jiangsu Province features a large population, a small land area, high GDP and fragile ecosystems. By 2012, its built-up land accounted for 21% of the total provincial land area. It is extremely urgent to optimize the distribution of population and industries vis-a-vis the province's environmental carrying capacity and prevent and control the damages to ecological functions that may be caused by irrational developmental activities.

In June 2013, Jiangsu took the lead to formulate and implement the *Plan for Protecting Ecological Redline Areas,* which delineated 569 areas covering natural reserves, forest parks, scenic spots, geoparks, sources of drinking-water, flood control areas, key water conservation areas, important fishery waters, important wetlands, watercourse maintenance areas, ecological forests, and special ecological industry areas, covering 23,431.65 square kilometers or 22.91% of the province's land area.

The plan proposes that more than 20% of the province's total land area be protected by eco-redlines. The differentiated regulations and controls for different areas are intended to provide effective protection of key ecological functions and major species, promote regional sustainable development, and leave favorable living and development space for future generations.

Source: Jiangsu Provincial Government, 2013.

Protocol. In January 2015, the State Council approved a major project of biodiversity conservation, consolidated the boundaries of priority areas for biodiversity conservation, intensified protection, conducted biodiversity surveys and evaluation, strengthened the development and management of natural reserves and improved in-situ and ex-situ conservation systems.

3.4.3 Implementing ecological restoration projects

Since the beginning of the 21st century, China has been implementing ecological restoration (or eco-restoration) projects including Natural Forest Protection, "Returning Farmland to Forests" ("Green-for-Grain), and "Returning Grazing Land to Grass Land".The Natural Forest Protection project has received an investment of USD 56.02 billion, effectively protecting a natural forest area of approximately 1.05 million square kilometers. The Chinese government has also decided to extend the natural forest protection throughout the country (Chen, 2015).

Moreover, the central government has invested USD 62.66 billion in 25 provinces/autonomous regions/ cities in the first round of the Grain-for-Green projects, converting 92,667 square kilometersof farmland back into forests together with 206,000 additional square kilometers of land dedicated for reforestation. The projects have involved 32 million rural households and 124 million farmers. In 2014, the country kicked off the second round of the Grain-for-Green projects. Between 2014 and 2015, 10,000 square kilometers of farmland was converted back into forests and grasslands, supported by USD 1.85 billion from the central government, of which USD 1.16 billion was cash payment to the affected and USD 700 million for acquiring the seedlings and paying for afforestation and grass planting efforts (State Council, 2015c).

3.4.4 Treatment of the rural environment

During the 12th Five-Year period, the government further implemented the policy of rewarding efforts to protect the rural environment. It organized three

rounds of demonstration projects for contiguous treatment of the rural environment involving 23 provinces/autonomous regions/cities. The central government earmarked USD 4.87 billion for rural environmental protection, supporting comprehensive environmental treatment in more than 78,000 villages, directly benefiting more than 140 million people in rural areas (Chen, 2016a).

In April 2015, the government proposed the building of "Beautiful Villages" as an important means of advancing agricultural modernization. Actions include: 1) carrying out village-level planning and ensuring that plans are science-based and enforceable; 2) building rural infrastructure, improving the ecological conditions of mountains, water courses, forests, farmland, and roads in an integrated manner, renovating rural houses in poor conditions, rolling out geographically contiguous treatment of the rural environment and targeted waste treatment as well as waste water treatment; 3) transforming rural development models, adjusting agricultural structure, developing a circular economy in the agriculture sector, managing agricultural related pollution, improving the quality of agricultural products; and 4) developing rural tourism that is premised on ecological and environmental protection (see Box 3-5).

BOX 3-5 Yonglian: A Beautiful Village

Yonglian is a village in southern Jiangsu Province with a large area and population as well as a strong economy. In recent years, Yonglian has been building itself into a "Beautiful Village"whose criteria include: 1) strong industrial development; 2) high quality of life; 3) high moral standards of the villagers; and 4) sound ecological environment. Yonglian now presents itself as a small town with many water courses, factories surrounded by gardens, modern farms, and civil relationships among villages. How has Yonglian transformed itself?

First, Yonglian has conducted sensible spatial planning. It has adopted the principle of differentiated zoning for industrial areas, residential areas, and agricultural areas and the criteria of regionalized, urbanized and modernized development. Accordingly, Yonglian has built a centralized residential area, known as the "Small Town of Yonglian" that can accommodate 30,000 people farmers. 98% of Yonglian's labor force is employed on-site. In 2013, the village's per capita income reached USD 5,088.

Second, Yonglian has strengthened environmental management. It has brought in a professional property management company to manage the communal environment. In order to sustain the protection of the community's environment, Yonglian organizes regular meetings involving the village's coordination team, the Yonglian Community, and the property management company , thereby achieving around-the-clock, full-coverage and participatory environmental governance.

Thirdly, Yonglian has promoted public participation in environmental management. It has opened up previously government-dominated environmental management and has facilitated the establishment of civil society organizations including the Yonglian Weiming Foundation, Huiming Service Center, the Union of Volunteers, and the Union for Building a civilized society. The village government procures specialized services from these organizations. Through the multiple-level engagement of participants and a diverse forms of approaches, Yonglian has pioneered a participatory environmental governance model that integrates rural traditions with modern management approaches.

Source: NGCEECTM, 2015.

Environmental public participation in a community.
© Deng Jia/China Environment News

3.4.5 Establishing Eco-civilization demonstration areas

The Eco-civilization demonstration projects are an effort to illustrate the idea of "Green is Gold". As early as 1995, the MEP launched ecological demonstration projects. In 2000, it started to build ecological provinces (eco-provinces), ecological cities (eco-cities), and ecological counties (eco-counties). In 2009, the government gave a unified name to all of these: Demonstration Areas of Ecological Development. In June 2013, the government adjusted the name to "Eco-civilization Demonstration Areas".

By May 2015, Fujian, Zhejiang, Liaoning, Tianjin, Hainan, Jilin, Heilongjiang, Shandong, Anhui, Jiangsu, Hebei, Guangxi, Sichuan, Shanxi, Hebei, and Hubei had started working towards the building of ecological provinces and more than 1,000 cities, counties, and districts are working towards attaining "eco" status. One hundred and fourteen areas such as Anji County in Zhejiang Province have acquired the status of "eco-counties" in recognition of their achievements (see Box 3-6). Across the country, 4,596 ecological villages/towns have been recognized as advanced models for socioeconomic development that is coordinated with the environment. During the 13th Five-Year period, China will further standardize such demonstration areas.

BOX 3-6 Anji: China's first Eco-county

Anji in Zhejiang Province is China's first eco-county. In the 1980s-1990s, in an effort to turn itself into a strong industrial county, Anji attracted highly polluting and energy intensive projects such as textile printing and dyeing, chemical engineering, paper making, and small-scale building materials, resulting in serious pollution. The county was listed by the State Council as a major target for (Taihu Lake related) water pollution treatment. Anji then reflected on its experience and decided to reshape the county on an ecological basis. In particular, it gave priority to building a circular economy of the bamboo industry and achieved 100% reuse of the residuals from bamboo production. Anji's bamboo industry has established a complete product chain, accounting for 20% of the national bamboo output with only 1% of the national standing bamboo resource. In 2012, Anji received the UN Habitat Award, the first in China at the county level.

Source: Chen, 2015.

3.5 ADDRESSING CLIMATE CHANGE

China has taken various measures to address climate change. In particular, it has set up targets and their achievement by integrating them into the five-year development plans and other medium- and long-term plans. Starting from the 11th Five-Year period, the government set up quantitative targets, mainly covering efficiency (energy intensity), pollution control (SO_2 emission), alternative energy, and forest area. During the 12th Five-Year period, the government raised the quantitative targets for 2015 and expanded their scope to include: 1) non-fossil energy to account for 11.4% of primary energy consumption; 2) energy consumption per unit of GDP to decrease by 16%; 3) CO_2 emission per unit of GDP to decrease by 17%; 4) total SO_2 emissions to decrease by 8% and NO_X by 10%; 5) forest stock to rise to 14.3 billion square meters; and 6) the value added of the seven "strategic emerging industry" [3] to rise to 8% of GDP (State Council, 2011).

The key to achieving these targets is to "divide and conquer" region by region and industry by industry. During the 11th Five-Year period, taking into account different regions' development stages and varied economic significance of their industrial sectors, local governments and enterprises have signed agreements to show commitments to achieving the various targets. During this period, China had rapidly improved its capacity to develop clean development mechanism (CDM) projects and used international capital and specialized techniques to improve the capacity of implementing carbon emission reduction projects. During the 12th Five-Year period, based on the experiment in the previous five years, the country launched 7 carbon trading pilots (see Box 3-7) to achieve these targets through market instruments. During this period, the government made a commitment to reducing carbon intensity by 40-45% by 2020 from the level in 2005. This target was included in the 12th FYP.

Huaneng post-combustion CO_2 capture experimental demonstration plant.
© Deng Jia/China Environment News

BOX 3-7 Carbon Trading Pilots in China

In 2013, carbon trading pilots were launched in Beijing, Tianjin, Shanghai, Chongqing, and Guangdong, Hubei, and Shenzhen. By the end of 2014, all of these pilot sites issued local carbon trading regulations covering more than 1,900 enterprises and other entities that are subject to emission control, distributing approximately 1.2 billion tons of carbon emission quotas. Thanks to increased monitoring and enforcement, the compliance rate of these pilot sites with the regulations is 96% in 2014 and 98% in 2015. By the end of August 2015, approximately 40.24 million tons of locally issued carbon quotas had been traded for USD190 million, and approximately 16.64 million tons of carbon emission quotas had been auctioned for USD120 million. China plans to launch its a nation-wide carbon emission trading system in 2017.

Source: NDRC, 2015

In 2014, China launched the *National Plan on Climate Change (2014-2020)*, presenting the major targets and tasks for addressing climate change by 2020. It has also submitted its INDC (intended nationally determined contribution) document to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat (State Council, 2015d). The INDC specifies a number of targets including reaching the peak in CO_2 emissions around 2030 if not earlier and proposes measures that will ensure the delivery of the targets.

In terms of specific actions, China has taken measures to adjust its industrial structure, save energy, improve energy efficiency, optimize energy structure, control emissions from non-energy related greenhouse gases, and increase carbon sequestration by forests. It has also taken actions in the areas of agriculture, water resources, forestry, ecosystems, coastal areas, and human health in order to minimize the negative impacts of climate change and increase climate adaptation capacity.

Signing ceremony of a cross-regional carbon trading cooperation. © Deng Jia/China Environment News

3.6 ENHANCING INTERNATIONAL ENVIRONMENTAL COOPERATION

China is implementing the greening of the Silk Road Economic Belt and the 21st-Century Maritime Silk Road Initiative (the Belt and Road Initiative or B&R) as well as the "Going Global" strategy, applying EIA to the "Going Global" projects (i.e. Chinese investments overseas), and strengthening environmental monitoring of the "Going Global" enterprises. At the same time, China is actively sharing its environmental protection experiences with other countries.

The country is proactive in meeting its international obligations and responsibilities for environmental protection. The government has joined more than 30 multilateral environmental conventions or protocols including the *Vienna Convention* and the *Montreal Protocol,* among others. As far as ozone protection is concerned, China has issued and implemented the *National Plan for Phasing out Ozone Depleting Substances (ODS),* formulated action plans to phase out 25 industries, shut down over 100 production lines, developed ODS substitutes for thousands of enterprises, phased out 250,000 tons of ODS (more

BOX 3-8 Guiyang: A City in the Forest[5]

Supported by the China Trust Fund, UNEP has commissioned studies on "multiple pathways to sustainable development", including Eco-civilization with several local examples, one of which is Guiyang.

Located in Southwest China, Guiyang is a city rich in natural resources. For a long time, however, Guiyang's economy was heavily dependent on the extraction and use of forest and mineral resources, seriously affecting and damaging the regional environment. At one point, Guiyang was labeled as "one of the ten most polluted cities in the world" and "one of the three cities hit hardest by acid rain in China."

In recent years, Guiyang's government has begun to explore pathways to sustainable development. It has taken the building of an Eco-civilization as a major means of promoting economic transformation. The development of sustainable agriculture and circular industry has replaced traditional industries. The mining industry has been replaced by non-ferrous, metallurgical, chemical, and pharmaceutical industries, which have relatively smaller environmental impact. Guiyang has also increased investment in the prevention and control of water pollution, enlargement of forest coverage, and the construction of wetland parks, thereby contributing to the significant growth of eco-tourism. Moreover, Guiyang has promoted regulatory reform for Eco-civilization by enhancing environmental law enforcement and the environmental judicial system. More than 500 pollution-related criminal cases have been presented to the court.

From 2006 to 2011, Guiyang achieved gradual improvement not only in environmental quality, but also in education, health, culture, employment, social safety, and, in particular, human settlement. During the same period, Guiyang's GDP grew at an annual average of 14.7%. In 2012, industrial value added (from large-scale enterprises) reached USD 27.85 billion, of which 62.5% came from 10 ecologically friendly industrial parks. Meanwhile, Guiyang's per capita GDP rose from USD 2,430 to USD 4,899. In spite of these achievements, Guiyang is still facing multiple urban development challenges. For instance, it needs to upgrade its transport system, reduce brain drain, and attract a more highly skilled labor force.

Source: UNEP, 2015.

than half of the total ODS phased out in developing countries) and successfully accomplished the tasks as scheduled in the Montreal Protocol (Chen, 2015).

The government is also committed to advancing global environmental governance and South-South environmental cooperation. It actively facilitated the inclusion of Green Economy in the Rio+20 outcome document, participated in the First United Nations Environmental Assembly (UNEA-1) and the negotiation of the 2030 Agenda for Sustainable Development, supported and participated in the Partnership for Action on Green Economy (PAGE), and is implementing a PAGE project in Jiangsu Province[4]. In 2012, at the Rio+20 Summit, China pledged USD 6 million (i.e. the China Trust Fund) to UNEP for supporting environmental capacity building in developing countries. In recent years, with the support of the Fund, UNEP has studied various countries' pathways to sustainable development (including research on Eco-civilization, see Box 3-8) and implemented a number of South-South Cooperation projects (UNEP, 2015), such as "Enhancing South-South Cooperation – Building the Capacity of Developing Countries to Promote Green Economies", "South-South Cooperation in Mongolia and Central Asia: Sharing Knowledge on Inclusive Green Economies and Eco-civilization", and "South-South Cooperation in China and Central Asia: Investing in a Green Silk Road".

At the same time, China has been also actively promoting international exchanges and cooperation on climate change. It has issued, for example, joint communiqués on climate change with Brazil, India, the EU, the U.K., and the U.S., and started planning the establishment of a South-South Cooperation Fund on Climate Change. It has also participated actively and constructively in international negotiations on the 2015 Paris climate agreement in 2015 and on the follow-up institutional arrangements.

4 ACHIEVEMENTS

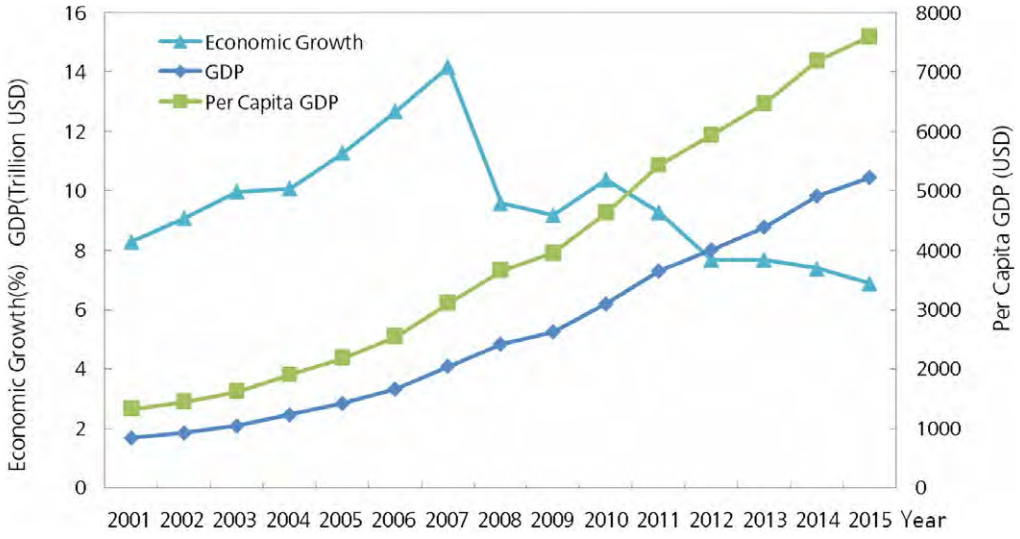
The air quality in Beijing has improved in recent years.
© Dengjia/China Environment News

4.1 SOCIOECONOMIC DEVELOPMENT

While building an Eco-civilization, China has maintained continuous and steady economic growth (see Figure 3). In 2015, the country's GDP reached USD 10.46 trillion, 6.9% over the previous year (see Figure 3). Compared to 2014, value added rose by 3.9% for primary industry, 6.0% for secondary industry, and 8.3% for tertiary industry. There were 771.16 million urban regular residents, accounting for 56.1% of the total population (NBS, 2016).

China's industrial structure has been further optimized. The value added of the tertiary industry accounted for 50.5% of GDP, 10% more than secondary industry (see Figure 4). Final consumption contributed to 66.4% of GDP, up 15.4% from 2014. People's livelihoods were further improved. Per capita disposable income was USD 3,393, an average between USD 4,819 in urban areas and USD 1,765 in rural areas, although with the Gini coefficient of 0.462 reflecting income inequality (NBS, 2016).

FIGURE 3. CHINA'S ECONOMIC GROWTH 2001-2015



Source: Economic growth data released by National Bureau of Statistics from 2002 to 2016.

FIGURE 4. CHANGES IN CHINA'S ECONOMIC STRUCTURE 2001-2015

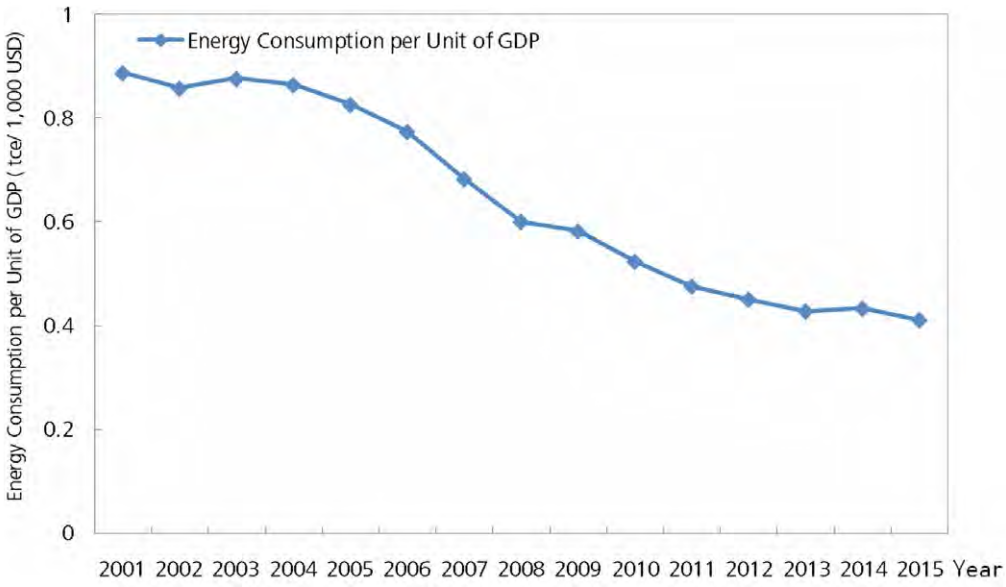
Source: Economic structure data released by National Bureau of Statistics from 2002 to 2016.

4.2 IMPROVEMENTS IN THE EFFICIENCY OF ENERGY AND WATER CONSUMPTION

Since 2001 China's energy consumption per unit of GDP has declined continuously. In 2015, total energy consumption was equivalent to 4.30 billion tons of standard coals, and energy consumption was equivalent to 0.41 ton of standard coals per USD 1,000 of GDP, 54% lower than the level in 2001 (see Figure 5).

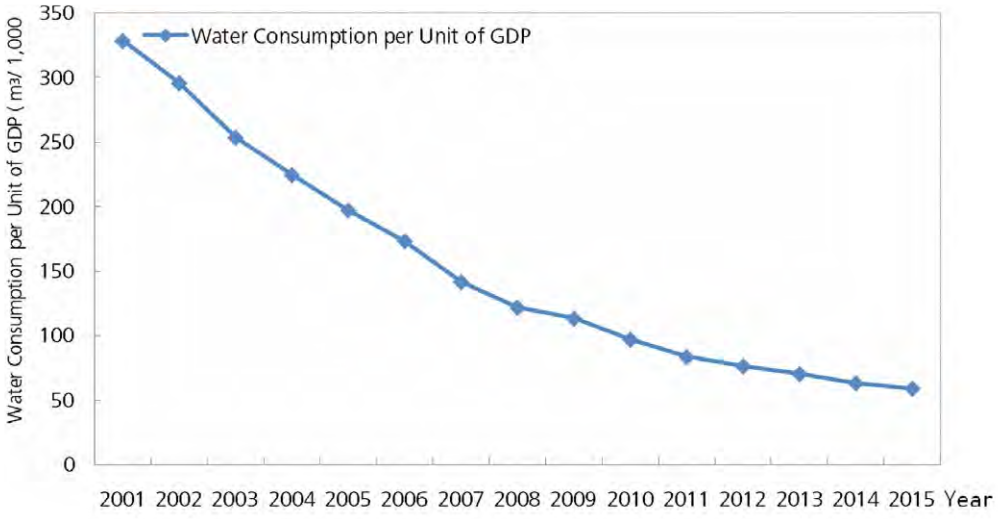
The efficiency of water consumption has the same trend as energy consumption. In 2014, China's total water consumption came down for the first time to 618 billion cubic meters. Water consumption per unit of GDP was 59 cubic meters per USD 1,000 of GDP, compared to 328 cubic meters per USD 1,000 of GDP in 2001 (see Figure 6).

FIGURE 5. CHANGES IN CHINA'S ENERGY EFFICIENCY 2001-2015



Source: Measured according to the GDP and total energy consumption data released by National Bureau of Statistics from 2002 to 2016.

FIGURE 6. CHANGES IN CHINA'S WATER EFFICIENCY 2001-2015



Source: Measured according to the GDP and total water consumption data released by National Bureau of Statistics from 2002 to 2016.

4.3 IMPROVEMENTS IN ENVIRONMENTAL QUALITY

In 2015, China's COD, NO_X, SO_2, and NH_3-N emissions decreased by 3.1%, 3.6%, 5.8%, and 10.9%, respectively, from their 2014 levels. The reduction of SO_2 and NO_X emissions has resulted in clear environmental improvements – the area hit by acid rain has shrunk to 1990s levels, the lowest in two decades. The average $PM_{2.5}$ concentration in the 74 cities where the new environmental air quality standard was first implemented in 2015 dropped by 14.1% from the level in 2014 (Chen, 2016a)(see Box 4-1).

The drop in COD emissions has contributed to the gradual improvement of the quality of rivers and lakes, with a significant reduction in the proportion of the Class-V water (i.e. worst water quality) in state-controlled sections of surface water bodies. In 2014, total amount of discharged heavy metal

BOX 4-1 Air Pollution Control in Linyi

Until recently, Linyi City has achieved economic growth at the expense of the environment, with large volumes of discharged pollutants and serious air pollution. Its air quality has always been ranked at the bottom in Shandong Province. In 2014, the city's SO_2, NO_X, and smoke/dust emissions accounted for 6.8%, 7.6% and 11.7%, respectively of the respective provincial levels. As a result, theMEPsummoned the leading officials in the city government and required them to enhance efforts to deal with air pollution in a comprehensive manner.

In response, the city government has set up a group, headed by the mayor, to implement air-pollution control, and has shut down 57 enterprises whose emissions had for years exceeded the permissible standards.The government has also restricted the production of 412 law-breaking enterprises and required them to clean up within specified times. As a result, the city's air quality has now clearly improved. In the first half of 2015, the number of days with good air quality increased by 31 (or 25.4%) over the same period in 2014, and $PM_{2.5}$, PM_{10}, SO_2, and NO_2 were 24.8%, 17.4%, 35.4%, and 16.9% lower than those in 2014.

These measures have not had any negative impacts on economic development. From January to June 2015, the city's public revenue reached USD 2.49 billion, a 12.3% increase over the previous six months and higher than the average revenue growth in Shandong Province as a whole, which was 9.1%. The city also generated 66,000 jobs in 2015, a growth rate of 12.2% over that in 2014. Registered unemployment rate was 2.04%, below the ceiling of 4%.

Source: Chen, 2016a.

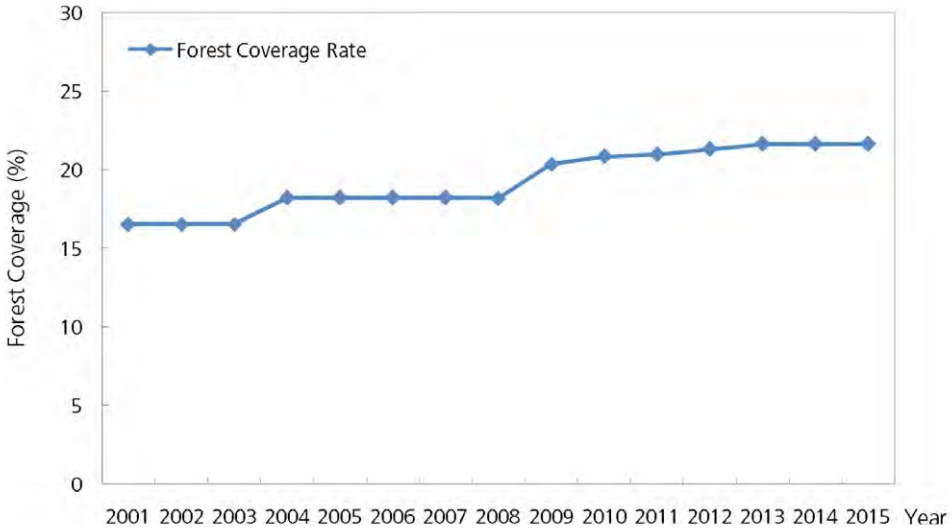
pollutants from lead, mercury, cadmium, chromium and metalloid arsenic declined by 20% from the level in 2007. The number of heavy metal pollution incidents also declined to 3 per year between 2012 to 2014 as compared to 10 per year between 2010 and 2011(Chen, 2015).

4.4 ACHIEVEMENTS OF ECOLOGICAL AND RURAL ENVIRONMENTAL PROTECTION

In the past decade, China's forest area has witnessed a net growth of 100,000 square kilometers and the forest coverage increased from close to 16.6% in the beginning of this century to 21.66% in 2015 (see Figure 7). The area of wetland under protection has increased by 13%. The area of water and soil erosion shrunk from 3.56 million square kilometers in 2000 to 2.95 million square kilometers in 2013, a reduction by one sixth. Furthermore, there is a zero increase in areas of desertification (Chen, 2016a).

Sanjiang Plain Wetland in Heilongjiang Province.
© Dengjia/China Environment News

FIGURE 7. CHANGES IN CHINA'S FOREST COVERAGE 2001-2015



Source: Forest coverage data released by National Bureau of Statistics from 2002 to 2016.

China has built an in-situ biodiversity protection system with nature reserves at the core, reinforced by ecological redlines. Various categories of terrestrial protected areas cover more than 1.70 million square kilometers, approximately 18% of the country's territorial land, more than achieving the 2020 target of 17% as required by the *Convention on Biological Diversity,* ahead of time. It has built up 2,729 nature reserves with a total area of 1.47 million square kilometers, approximately 14.8% of its land area, higher than the world average of 12.7%, protecting 85% of the terrestrial ecosystem types and wildlife. The panda, a species endemicto China, has now been reclassified from being "endangered" to "vulnerable", as have been 40 other species of mammals in the country (Chen, 2016b) (see Box 4-2).

BOX 4-2 Temporary Ban on Import of African Ivory Carvings

In February 2015, China's State Forestry Administration issued its 7th Announcement of the year, imposing a one-year ban on the import of African ivory carvings acquired after the entry into force (1 July 1975) of the *Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).* It requires Chinese citizens to stop buying and bringing ivory carvings into China. In the year following the announcement, the State Forestry Administration would stop accepting any application for ivory imports.

The protection of Africa's wild elephants is challenging in the context of rampant illegal hunting, habitat damage and loss, conflicts between human and elephants, war and military conflicts, weak law enforcement capacity, and widespread poverty. The international community including China is paying close attention to the challenges. As a CITES signatory, China has to seriously implement related international obligation. The temporary ban is of positive significance in promoting and supporting the protection of African elephants. The State Forestry Administration calls on other countries to also adopt similar measures and actions to reduce the purchase of ivory carvings and hopes that African countries will enhance the protection of elephant habitats, market regulation,and law enforcement to ensure the protection of wild elephants at the source.

Source:SFA, 2015.

The rural environment has been largely improved in Anji County of Zhejiang Province.
© Policy Research Center for Environment and Economy, MEP, P.R. China

In addition, in the first four years of the 12th Five-Year period, China succeeded in providing safe drinking water for 281 million people living in rural areas. By the end of 2014, 78% of the rural population had access to centralized water supply, up from 38% in 2004. The drinking-water sources of those villages that participate in environmental improvement projects have been protected, domestic sewage, waste, and pollution from animal husbandry haven been effectively controlled and the rural environment has been improved (Chen, 2015).

4.5 PROGRESS IN ADDRESSING CLIMATE CHANGE

In the first four years of the 12th Five-Year period, China's CO_2 emission per unit of GDP – cumulatively - dropped by approximately 16% (in 2014– the fourth year of the period, the reduction was 33.8% from the level in 2005) (Chen, 2016a). In 2014, non-fossil energy accounted for 11.2% of primary energy consumption, installed hydropower capacity reached 300 GW (2.57 times that of 2005), the grid-connected installed capacity of wind power was 95.81 GW (90 times that of 2005), installed PV capacity was 28.05 GW (400 times that of 2005) and installed nuclear power capacity was 19.88 GW (2.9 times that of 2005)(State Council, 2015d).

5 OUTLOOK

Wind farm in the Sanjiang Plain of Heilongjiang Province.
©Deng Jia/China Environment News

In the coming years, the international community will jointly promote the implementation of the 2030 Agenda and lead humanity towards the SDGs. China's effort to build an Eco-civilization will have a decisive impact on the delivery of the 2030 Agenda. Therefore, the government has incorporated the implementation of the *2030 Agenda* into the 13th Five-Year Plan, underpinned by the idea of promoting an "innovative, coordinated, green, open and shared development". The plan put forward a series of targets and indicators for measuring inclusive green development (see Table 4). Some of these are: 1) by 2020, water consumption, energy consumption, and CO_2 emission per unit of GDP should decrease by 23%, 15%, and 18%, respectively, from the respective 2015 baselines; 2) forest coverage should reach 23.04%; 3) efficiency of energy and resource use should increase by a large margin; 4) overall ecological and environmental quality should improve, especially with regard to air pollution control - the share of days per year with good air quality in cities at the prefectural level and above should exceed 80%.

TABLE 4. CHINA'S SOCIOECONOMIC DEVELOPMENT INDICATORS IN THE 13TH FIVE-YEAR PLAN

Indicators		2015	2020	Annual Average Growth (cumulative)	Types
Economic development					
(1) GDP (Trillion USD)		10.46	>14.32	>6.5%	Predictive
(2) Overall labor productivity (10,000USD/ Person)		1.34	>1.85	>6.6%	Predictive
(3) Urbanization	Resident urban population in total population (%)	56.1	60	[3.9]	Predictive
	Registered urban population in total population (%)	39.9	45	[5.1]	
(4) Value added of service industry (% of GDP)		50.5	56	[5.5]	Predictive
Innovation					
(5) R&D expenditure GDP (% of GDP)		2.1	2.5	[0.4]	Predictive
(6) Patents held per 10,000 people (piece)		6.3	12	[5.7]	Predictive
(7) Contribution of science and technology (% of GDP)		55.3	60	[4.7]	Predictive
(8) Internet penetration	Fixed broadband penetration (% of households)	40	70	[30]	Predictive
	Mobile broadband penetration (% of internet users)	57	85	[28]	
People's well-being					
(9) Growth of per capita disposable income (%)		—	—	>6.5	Predictive
(10) Average schooling of working-age population (year)		10.23	10.8	[0.57]	Binding
(11) Increase in urban employment (10,000 people)		—	—	[>5000]	Predictive
(12) Rural population lifted out of poverty (10,000 people)		—	—	[5575]	Binding
(13) Basic pension coverage (%)		82	90	[8]	Predictive
(14) Renovation of urban slums (10,000 units)		—	—	[2000]	Binding
(15) Per capita life expectancy (years of age)		—	—	[1]	Predictive
Resources and environment					
(16) Minimum amount of cultivated land (square kilometers)		1,243,333	1,243,333	[0]	Binding
(17) Maximum amount of additional land for development (square kilometers)		—	—	[<21,707]	Binding
(18) Reduction of water consumption per unit of GDP (%)		—	—	[23]	Binding
(19) Reduction of energy consumption per unit of GDP (%)		—	—	[15]	Binding
(20) Non-fossil energy in primary energy consumption rate (%)		12	15	[3]	Binding
(21) Reduction of CO_2 per unit of GDP (%)		—	—	[18]	Binding

(22) Forest development	Forest coverage (%)	21.66	23.04	[1.38]	Binding
	Forest stock (100m m^3)	151	165	[14]	
(23) Air quality	Percentage of days per year with good air quality in cities at the prefectural level and above (%)	76.7	>80	—	Binding
	Reduction of $PM_{2.5}$ concentration in cities at the prefectural level and above that currently do not meet the acceptable standards (%)	—	—	[18]	
(24) Surface water quality	Share of water bodies at Class III or above (%)	66	>70	—	Binding
	Share of water bodies at Class V (%)	9.7	<5	—	
(25) Reduction of major pollutants (%)	COD NH_3-N SO_2 NO_X	—	—	[10] [10] [15] [15]	Binding
Note: (1) The growth of GDP and overall labor productivity is in real prices whereas their absolute values are in constant prices of 2015. (2) [ ] denotes a cumulative number over five years. (3)The acceptable annual average level of $PM_{2.5}$ is 35 ug/m^3 and below.					

Source: State Council, 2016.

During the 13th Five-Year period, China is expected to continue to promote regulatory reforms in relevant fields. It will implement a series of programmes and action plans, enhance international cooperation in areas of relevance to Eco-civilization, offer demonstrations to the rest of the world while moving forward its own pace to build an Eco-civilization, and provide more and unique contributions and inspiration for sustainable development at the global level.

Regulatory reforms for Eco-civilization: China plans to deepen the implementation of the "1+6" plan issued in October 2015 on regulatory reforms for Eco-civilization. The "1" refers to the overall plan on the regulatory reforms for Eco-civilization whereas the "6" includes: 1) the Environmental Protection Inspection Plan (for trial implementation); 2) the Plan for Building an Ecological and Environmental Monitoring Network; 3) the Pilot Plan for Auditing Ex-Officials for the Status of the Natural assets (that were under their responsibility); 4) Measures for Holding Leading Officials Accountable for Ecological and Environmental Damages; 5) the Pilot Plan to Compile Balance Sheets of Natural assets; and 6) the Pilot Plan to Reform the System of Compensation for Ecological and Environmental Damages. The various targets and measures of building an Eco-civilization are to be translated into practice by different levels of the government, which are subject to strict accountability and investigation systems (Chen, 2015).

Reform of the Basic System for environmental protection: the government plans to: 1) strengthen its environmental rule of law and continue to use legal instruments to protect the environment; 2) accelerate the establishment of a pollution permit system covering all the enterprises that have fixed sources of pollution, reform the systems of EIA, pollution caps, emission standards, and pollutant charges, establish a regulatory regime that takes environmental quality improvement as its core, effectively coordinated with other related regulatory systems, and operationally smooth, simple and efficient ; 3) build a national, unified real-time online monitoring system – allowing the interconnection and sharing of data - covering environment quality, targeted sources of pollution, and ecological conditions; 4) improve the market system for environmental protection and the system of environmental information disclosure; 5) strengthen the central government's supervision of local governments' environmental performance and urge local governments to fulfill their environmental duties. In addition to piloting the environmental supervision of Hebei Province in January-February 2016, the government is expected to complete the supervision of approximately 15 provinces in 2016 and all the provinces in 2017 (Chen, 2016a).

Actions to Build an Eco-civilization: China has followed the idea of green development in formulating and implementing the 13th Five-Year Plan for Economic and Social Development as well as the 13th Five-Year Environmental Protection Plan. It is expected to continue to implement the *Air Action Plan* and *Water Action Plan,* and accelerate the formulation and implementation of the *Soil Action Plan.* Moreover, the government intends to carry out green action plans for new urbanization, energy development, climate change, and industrial manufacturing.

- ***Urbanization:*** promoting people-centered new urbanization, emphasizing three major issues[6] each affecting 100 million people (State Council, 2014a).
- ***Energy development:*** limiting total primary energy consumption to 4.8 billion tons equivalent of standard coal and total coal consumption to 4.2 billion tons; increasing the share of non-fossil energy in primary energy consumption up to 15% and natural gas above 10%; and limiting the share of coal consumption to 62% (State Council, 2014b).
- ***Climate change:*** seeking to reach peak CO_2 emissions by 2030 and achieve that goal as early as possible, making constant efforts with regard to 15 aspects: 1) national strategy; 2) regional strategy; 3) the energy system; 4) the industrial system; 5) construction and transport; 6) forest carbon sinks; 7) lifestyles; 8) climate adaptability; 9) low-carbon development models; 10) technological support; 11) financing; 12) carbon trading; 13) statistics and accounting systems; 14) public participation; and 15) international cooperation (State Council, 2015d).
- ***Industrial manufacturing:*** accomplishing basic industrialization by 2020, striving to build a green manufacturing system that is efficient, clean, low-carbon, and circular, and facilitating the clear drop in energy consumption, material consumption, and pollution per unit of value added in key industrial sector (State Council, 2015e).

China's Eco-civilization concept is gradually gaining appreciation at the international level. In 2013, the 27th Governing Council of UNEP made a reference to the Eco-civilization concept in its Decision 27/8. In 2014 at the First United Nations Environment Assembly (UNEA), China's Eco-civilization strategies, actions and achievements were once again broadly appreciated by environment ministers. Moving forward, China is expected to participate more actively in international environmental cooperation and sustainable development. As Chinese President Xi Jinping pointed out, "the international community should join hands and move together towards Eco-civilization at the global level".

The country also plans to accelerate the building of an Eco-civilization with a global perspective and turn green development into a source of new, comprehensive national strength, influence, and international competitiveness. It intends to pursue to the fullest extent the notions of inclusiveness, mutual learning, and win-win cooperation, strengthen the dialogues, exchanges, and practical cooperation

with other countries in areas of relevance to Eco-civilization in order to promote global ecological security.

Moreover, China is working to incorporate the concept of an Eco-civilization into the implementation of the B&R Initiative as well as the process of South-South cooperation so as to avoid the transfer of its polluting industries elsewhere and to advance the establishment of green supply chains. The country will also support other developing countries' sustainable development efforts through green finance, investment, and trade policies via institutions such as the Asian Infrastructure Investment Bank (AIIB) and the New Development Bank initiated by BRICS countries as well as UNEP and other parts of the United Nations System.

NOTES

[1] The report uses the RMB/USD exchange rate of 6.473 from 19 April 2016.

[2] According to the data from China Association of Automobile Manufacturers.

[3] "Strategic emerging industry" refers to energy efficient and environmental technologies, next generation information technology (IT), biotechnology; high-end equipment manufacturing, new energy, new materials, and new-energy vehicles (NEVs).

[4] For more information, please refer to: http://www.un-page.org/countries/page-countries/china.

[5] For more information, please refer to: http://www.unep.org/greeneconomy/Portals/88/documents/GEI%20Highlights/MultiplePathwaysSustainableDevelopment.pdf.

[6] Encouraging 100 million people to settle in urban areas, renovating urban slums and urban villages (poor villages within urban areas) that accommodate 100 million people, and guiding 100 million people to urbanize locally in Central and Western regions (i.e. without outward migration).

REFERENCES

Chen, J. (2015). *Report on Environmental Protection Achievements during the 12th Five-Year period.* Available at http://www.mep.gov.cn/gkml/hbb/qt/201510/t20151014_314962.htm. *

Chen, J. (2016a). *Address on the National Environmental Protection Conference 2016.* Available at http://www.mep.gov.cn/gkml/hbb/qt/201601/t20160114_326153.htm. *

Chen, J. (2016b). "Establish Green Development Concept Firmly and Accelerate Removal of Weakness in Ecology and Environment" in *Study Times,* January 11, 2016. Available at http://www.cntheory .com/zydx/2016-01/ccps1601118V34.html. *

China Council for International Cooperation on Environment and Development. (2015). *Task Force Report: Rule of Law and Ecological Civilization.* Available at http://www.cciced.net/encciced/policyresearch/report/201511/P020151124412845815378.pdf.

EU-China Environmental Governance Programme. (2015). *Public Participation into Environmental Governance of Jiaxing Mode and Its Generalizability in Zhejiang.**

Jiangsu Provincial Government. (2013). *Plan of Jiangsu Province for Protection of Ecological Redline Areas.*Available at http://www.jiangsu.gov.cn/jsgov/tj/bgt/201309/W020130923621842038153.doc. *

Ministry of Environmental Protection. (2002). *National Environmental Statistics Bulletin 2001.* Available at http://zls.mep.gov.cn/hjtj/qghjtjgb/200206/t20020605_83097.htm.*

Ministry of Environmental Protection.(2015a). *The Notification of the Implementation of the New Environmental Law and Supporting Measures.* Available at http://www.zhb.gov.cn/gkml/hbb/qt/201506/t20150615_303569.htm. *

Ministry of Environmental Protection.(2015b). *Ministry of Environmental Protection Announced the List of Insured Companies for Environmental Pollution in 2015.* Available at http://www.zhb.gov.cn/gkml/hbb/qt/201512/t20151223_320045.htm. *

Ministry of Environmental Protection. (2015c). *Implementation Opinions for Accelerating the Promotion of Green Lifestyles.* Available at http://www.mep.gov.cn/gkml/hbb/bwj/201511/t20151116_317156.htm.*

Ministry of Environmental Protection. (2015d). *National Environmental Statistics Bulletin 2014.* Available at http://zls.mep.gov.cn/hjtj/qghjtjgb/201510/t20151029_315798.htm. *

Ministry of Environmental Protection. (2015e). *Technical Guidelines for Ecological Redline Designation.* Available at http://www.zhb.gov.cn/gkml/hbb/bwj/201505/W020150519635317083395.pdf. *

National Bureau of Statistics. (2013). *Great Changes in China's Economic and Social Development since 1978.* Available at http://www.stats.gov.cn/tjgz/tjdt/201311/t20131106_456188.html.

National Development and Reform Commission, Ministry of Land Resources, Ministry of Environmental Protection and Ministry of Housing and Urban-Rural Development. (2014). *Notice on Implementing the Plans Integration Pilot Work in Cities and Counties.* Available at http://www.sdpc.gov.cn/zcfb/zcfbtz/201412/t20141205_651312.html.

National Development and Reform Commission. (2013). *China's Policies and Actions on Climate Change 2013.* Available at http://qhs.ndrc.gov.cn/gzdt/201311/W020131107536699352963.pdf.

National Development and Reform Commission. (2014). *China's Policies and Actions on Climate Change 2014.* Available at http://www.sdpc.gov.cn/gzdt/201411/W020141126538031815914.pdf.

National Development and Reform Commission. (2015).*China's Policies and Actions on Climate Change 2015.* Available at http://www.china.com.cn/zhibo/zhuanti/ch-xinwen/2015-11/19/content_37106833.htm.

National Guiding Committee for Edition and Examination of Cadre Training Materials. (2015). *Building a Beautiful China.* Beijing: People's Publishing House. *

National Bureau of Statistics. (2016). *Operating Status of National Economy in 2015.* Available at http://www.stats.gov.cn/tjsj/zxfb/201601/t20160119_1306083.html. *

Pan, Q. and Bi C.(2014). "Ecological Compensation Pilot at Upstream Xin'an River Shows Integrated Effect" in *China Environment News,* February 7, 2014. Available at http://www.cenews.com.cn/sylm/hjyw/201402/t20140207_764288.htm.*

State Council. (2011).*Outline of the 12th Five-Year Plan on National Economic and Social Development.* Available at http://www.gov.cn/2011lh/content_1825838.htm.

State Council. (2013). Action Plan on Prevention and Control of Air Pollution.Available at http://www.cleanairchina.org/file/loadFile/27.html.

State Council. (2014a). *National Plan on New Urbanization (2014-2020).* Available at http://www.gov.cn/gongbao/content/2014/content_2644805.htm. *

State Council. (2014b). *Plan for Strategic Action on Energy Development (2014-2020).* Available at http://www.gov.cn/zhengce/content/2014-11/19/content_9222.htm. *

State Council. (2015a). *Opinions on Accelerating the Construction of Ecological Civilization.* Available at http://www.scio.gov.cn/xwfbh/xwbfbh/yg/2/Document/1436286/1436286.htm. *

State Council. (2015b). *Action Plan on Prevention and Control of Water Pollution.* Available at http://www.caep.org.cn/uploadfile/%E6%B0%B4%E9%83%A8/%E6%B0%B4%E6%B1%A1%E6%9F%93%E9%98%B2%E6%B2%BB%E8%A1%8C%E5%8A%A8%E8%AE%A1%E5%88%92%E8%8B%B1%E6%96%87%E7%89%88.pdf.

State Council. (2015c). *General Plan for a New Group of Grain-for-Green Projects.* Available at http://www.gov.cn/xinwen/2016-02/05/content_5039662.htm. *

State Council. (2015d). *Intensify the Action to Cope with Climate Change—China's Intended Nationally Determined Contribution.* Available at http://www.gov.cn/xinwen/2015-06/30/content_2887330.html. *

State Council. (2015e). *Made in China 2025.* Available at http://www.gov.cn/zhengce/content/2015-05/19/content_9784.htm. *

State Council. (2016). *Outline of the Thirteenth Five-Year Plan for National Economic and Social Development.* Available at http://www.china.com.cn/lianghui/news/2016-03/17/content_38053101.htm. *

State Forestry Administration. (2015). *7th Announcement of 2015.* Available at http://www.forestry.gov.cn/main/72/content-742636.html. *

Tong, K. (2015). *The Ministry of Environmental Protection Issued the Notification of the Environmental Crime Cases of 2014.* Available at http://www.cenews.com.cn/sylm/hjyw/201504/t20150415_790886.htm. *

UNEP. (2015). *Multiple Pathways to Sustainable Development: Initial Findings from the Global South.* Available at http://www.unep.org/greeneconomy/Portals/88/documents/GEI%20Highlights/MultiplePathwaysSustainableDevelopment.pdf.

*Available only in Chinese.