

THE CHINESE ENVIRONMENTAL POLICY RESEARCH WORKING PAPER

Issue 19 Volume 5 No.4 May 2018



Chinese Academy of Environmental Planning
<http://www.caep.org.cn>

Progress Report 2017 on China's Green Financial Policy

GE Chazhong, CHENG Cuiyun, WENG Zhixiong, DONG Zhanfeng,
DU Yanchun, WU Bo, DUAN Yunting



Foreword »

✦ Editor in Chief: Prof. WANG Jinnan



Since its opening-up and reform, China has been in the process of rapid economic development with its people enjoying an increasingly improved standard of life. Meanwhile accompanying this dramatic economic growth is the degradation of environment which has, to some extent, damaged the gains of the opening-up and reform and prevented the economy from a healthy and sustainable development. The Chinese government is increasingly aware of that without addressing the environmental issues it is facing now, will jeopardize its long term goal of the great rejuvenation of the Chinese nation. Given the magnitude and complexity of the environmental issues in China, there is no easy way in addressing them and the solution to them entails an equal priority being given to environmental protection, ecological conservation and economic development or even higher than the latter by mainstreaming the former into the overall socio-economic decision-making process. As a matter of fact, China has been in the struggle against environmental pollution since the very beginning of its

economic take-off and trying to explore a pathway that could help address China's environmental issues in the way most suitable to China's specific circumstances.

In recent years, especially since the 12th Five-Year Plan period, the enhanced measures including legislation, policy, regulatory and economic means have been taken by the Chinese government in dealing with environmental problems, of which environmental policies have played an important role in this regard. Corresponding to this situation and in meeting the demand of governments at different levels for environmental policy tools, the environmental policy research projects on topics of a wide range have been conducted by some Chinese environmental research institutions including the Chinese Academy for Environmental Planning (CAEP).

CAEP founded in 2001, is a research advisory body supporting governments in the development of key environmental planning, national environmental policies, and major

environmental engineering projects. In the past more than 10 years, CAEP has accomplished the development of the overall planning of national environmental protection for the 10th, 11th and 12th Five-Year Plan periods; water pollution prevention and control planning for key river basins; air pollution prevention and control planning for key regions; soil pollution prevention and control planning; and some regional environmental protection plans. In the same period of time, CAEP also actively engaged in research on such topics as green GDP, environmental taxation, emission trading, ecological compensation, green financing, etc. By so doing, CAEP has become an indispensable advisory body in the environmental decision-making in mainland China. According to *2013 Global Go To Think Tanks Report and Policy Advice* published by University of Pennsylvania, CAEP was ranked 31 in the field of environment in the world. Many of CAEP's research results and project outcomes regarding environmental policies have drawn great attention of decision makers and international institutions, and have been utilized to contribute to the formulation of national environmental policies concerned.

The Chinese Environmental Policy Research Working Paper (CEPRWP) is a new internal publication produced by CAEP for the purpose of facilitating the academic exchange with foreign colleagues in this field, in which the selected research papers on environmental policies from CAEP are set out on the irregular basis. It is expected that this publication will not only make CAEP's research results on environmental policies be known by foreign colleagues but also serve as a catalyst for creating

opportunity of international cooperation in the field of environmental policies, and environmental economics in particular, with a view of both the academic research and practical policy needs.

Looking back to 2017, China has made remarkable achievements in the formulation and practice of green financial policies. The Report to the 19th National Congress of the Communist Party of China (CPP) made it clear to develop green finance, which identifies green finance a national development strategy and shows the direction for its development in the current and future periods. Market-based green financial systems further leveraged the environmental protection market to harness its potential. Top-level policy design and institutional arrangement consolidated the institutional guarantee for green finance. Innovative products and services such as green credit and green bonds further expanded the share of green finance in the financial market. The launch of national emissions trading market, combined with the Hamburg Group of Twenty (G20) Summit and the Belt and Road Initiative, continued to enhance China's influence in global green financial development by promoting more extensive exchange and cooperation with other countries. In order to keep abreast of China's policy system and practical progress in the field of green finance, the Progress Report 2017 on China's Green Finance Policy is hereby prepared, with immerse support from the Ministry of Environmental Protection (MEP) and the Green Finance Committee of the China Society for Finance & Banking (CSFB-CFC).

Contents >>

I. Strong Demand and Innovation-driven Development	1
1.1 Innovative market-oriented mechanisms for environmental protection	1
1.2 Broad prospect for environmental protection industry	2
II. Comprehensive Acceleration and Effective Policy	4
2.1 Rise of green finance into national development strategy	4
2.2 Full advancement of green finance pilots	5
III. Diverse Products and Active Practice	8
3.1 Steady growth in green credit	8
3.2 In-depth advancement of green bond market	8
3.3 Expanding green funds	11
3.4 Breakthroughs in the emissions trading market	12
3.5 Rise of various green financial products from ashes	13
VI. Strengthened Cooperation and Common Development	15
V. Conclusions	18
Reference	19





I. STRONG DEMAND AND INNOVATION-DRIVEN DEVELOPMENT

Green financial market is closely linked to environmental protection market. In 2017, the potential of environmental protection market was further unleashed as the pace of environmental pollution control picked up in the process of building an ecological civilization. Energy performance contracting (EPC) and its services were expanding the scope, and innovative services such as eco-managers and eco-hospitals were springing up. The environmental protection market maintained a rapid growth driven by innovation.

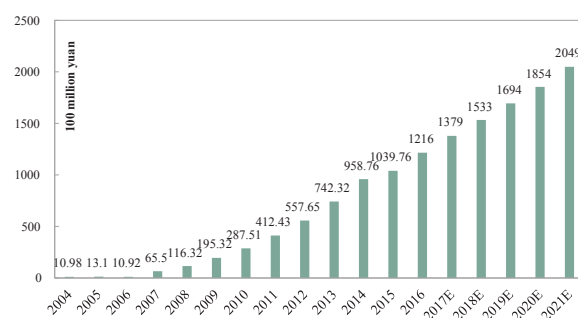
1.1 Innovative market-oriented mechanisms for environmental protection

The market-oriented mechanisms for environmental protection continued to innovate. Expanding EPC services and fields and innovative development models, such as eco-managers and eco-hospitals, have not only created opportunities for environmental governance and environmental protection industry, but also significantly simulated the market demand for green finance.

Expanding EPC services and fields. In the recent decade or so, the EPC investment in China tended to grow rapidly, with the scale up from 1.098 billion yuan in 2004 to 121.6 billion yuan in 2016. It is expected to maintain the trend of rapid growth during the 13th Five-Year Plan (FYP) period (Figure 1). In terms of practice, field-

specific EPC technical specifications have been further established. The Ministry of Housing and Urban-Rural Development (MOHURD) published the *Technical Specification on Energy Performance Contracting for Urban Lighting* in January 2017. The Technical Specification set out the terms, basic requirements, and specific requirements for energy-saving technologies and measures, energy-saving assessment, and energy-saving benefit sharing in urban lighting EPC projects, considering their particularity and commonality. The implementation provides important technical support for relevant standards and policies at the national level and plays a vital role in the sound and sustainable development of energy-saving services.

■ Figure 1 Actual and estimated EPC investment in China (2004~2021)¹



Source: Outlook Report on Energy Management Contracting Industry and relevant information from China Industry Energy Conservation Network and Qianzhan Industry Research Institute.

* ¹ Note: E in Figure 1 represents estimated value. As the latest data was published as of 2016, forecasts in the Outlook Report on Energy Management Contracting Industry from the China Industry Energy Conservation Network were used as a reference.



Emerging innovative services such as eco-managers and eco-hospitals. With continuous advances in the Internet technology, innovative practice is increasingly enriched in the environmental protection market. Eco-managers are exactly one-stop environmental services provided for governments at all levels, parks of various types and enterprises based on the Internet technology and platform, which forms the whole industrial chain with shared resources and information and complementary advantages. In June 2017, Shanxi Province's first eco-manager was established through a strategic cooperation project of the People's Government of Yaodu District in Linfen City, Shanxi Xunsu Environmental Consulting Co., Ltd. and Shanxi Institute of Energy to provide enterprises with integrated services and solutions for industrial pollution control. Eco-hospitals are another innovative way to market-oriented environmental protection. In November 2017, Pinghu Eco-hospital was jointly set up by the Environmental Protection Bureau of Pinghu City and Jiaxing Tongji Environmental Research Institute. Its services, targeted at governments, industry associations and enterprises, include (a) advice on decision, technical support, training and talent cultivation on environmental protection for governments and relevant departments; (b) consultation and technical support for relevant industry associations to enhance their service capabilities in environmental protection; and (c) consultation, technical support and training on pollution treatment and environmental protection for enterprises. This gives rise to a new innovative model of industry services to solve various environmental problems. Yet, statistics

remain inadequate though such model has received increasing attention and full promotion in some companies.

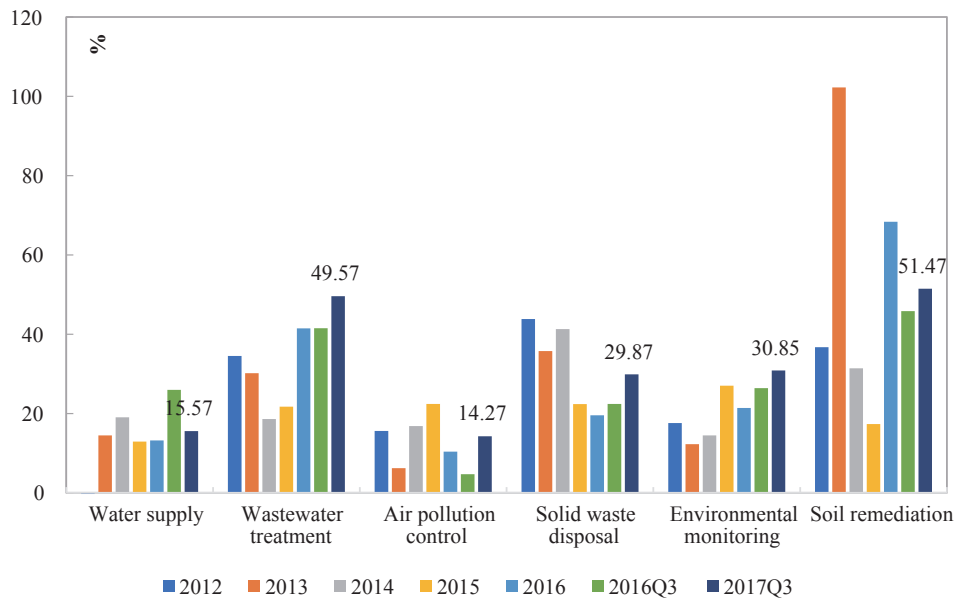
1.2 Broad prospect for environmental protection industry

China's environmental protection industry including air, water and soil pollution control has enjoyed relatively fast growth and expanded the market share in recent years.

Sustained momentum of rapid growth in the overall environmental protection market. Figure 2 and Figure 3 show the growth in operating revenue and net profit of China's listed environmental protection enterprises respectively. On the whole, the operating revenue and net profit of listed enterprises maintained an upward trend despite a certain degree of fluctuation, implying a strong development momentum of environmental protection enterprises. By sub-sectors, soil remediation, wastewater treatment and environmental monitoring were the top three of operating revenue in the first three quarters of 2017, with growth registered 51.47%, 49.57% and 30.85% respectively; wastewater treatment, soil remediation and environmental monitoring topped the net profit after growth of 59.56%, 59.15% and 42.78% respectively. It should be noted that the net profit shrank only in the sub-sector of air pollution control, with a decrease of 6.29% in the first three quarters of 2017, nearly two percentage points more than the increase of the first three quarters of 2016. Front-end preventive measures, such as industrial production restriction and coal-to-gas change, compressed to some extent the profit margins of enterprises that mainly specialize in the equipment and operation for end-of-pipe treatment of air pollution.



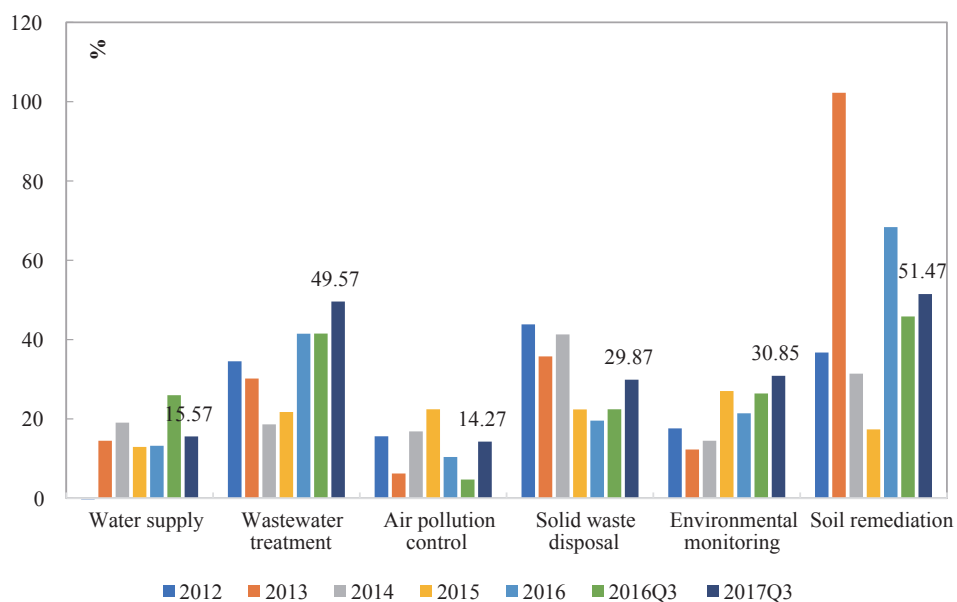
■ **Figure 2 Operating revenue growth of China's listed environmental protection enterprises by sub-sectors (2012–2017)**



Note: 53 listed companies only are covered due to data unavailability. In the figure, colored histograms represent different years.

Source: First CIB Research, wherein the 2017 data are limited to the first three quarters.

■ **Figure 3 Net profit growth of China's listed environmental protection enterprises by sub-sectors (2012–2017)**



Note: 53 listed companies only are covered due to data unavailability.

Source: First CIB Research, wherein the 2017 data are limited to the first three quarters.



II. COMPREHENSIVE ACCELERATION AND EFFECTIVE POLICY

Green finance has entered a stage of fully accelerated development. It has been recognized as a national strategy when written into the Report to the 19th CPC National Congress. Centering closely on the construction of ecological civilization, the CPC Central Committee with Comrade Xi Jinping as the core has introduced a raft of policies and plans for green finance. The State Council deployed pilot zones for reform and innovation in green finance and local governments proactively built systems in support of green finance, laying a sound institutional and policy foundation for all-round quicker development of green finance.

2.1 Rise of green finance into national development strategy

Green finance will play an important role for now and beyond as a national strategy with support explicitly noted by the Report to the 19th CPC National Congress.

Support proposed by the Report to the 19th CPC National Congress. General Secretary Xi Jinping delivered on behalf of the 18th CPC Central Committee the Report to the 19th CPC National Congress on October 18, 2017 in Beijing. The Report systematically elaborated a series of new concepts, new ideas and new strategies, including development strategies in the financial field. It clearly put forward the development of green finance and called on us to promote green development, noting that we will step up efforts to establish a legal and policy framework that promotes green production and consumption and to promote a sound economic structure

that facilitates green, low-carbon, and circular development; we will create a market-based system for green technology innovation, develop green finance, and spur the development of energy conservation and environmental protection industries as well as clean production and clean energy industries. This means that green finance has risen to the national strategic level, which is also conducive to global green transformation and sustainable development. At the National Financial Work Conference on July 14, 2017, General Secretary Xi Jinping spoke on advancing financial reform, perfecting financial system and innovating financial products, and proposed "to encourage green finance", sending a strong policy signal for deepening the development of green finance.

Policies promulgated by ministries to support green finance. On March 3, 2017, China Securities Regulatory Commission (CSRC) issued the *Guiding Opinions of China Securities Regulatory Commission on Supporting the Development of Green Bonds* to provide strong policy support for the development of green bonds. On the whole, the Guiding Opinions clarified that (a) green corporate bonds are corporate bonds used to raise funds to support green industry projects under the relevant laws and regulations; (b) the green industry projects in which the proceeds are invested shall be determined by reference to the requirements of the *Catalog of Projects Backed by Green Bonds*, and priority shall be given to green industries such as energy



conservation, pollution prevention and control, energy conservation and recycling, clean transport, clean energy, ecological protection and adaption to climate changes; (c) the entities that enjoy prioritized support in issuing green corporate bonds include mature enterprises with long focus on the green industry, potential enterprises with leading technologies or unique advantages in the green industry, enterprises engaged in public-private partnership (PPP) projects for medium and long-term development of green industry, and international financial organizations/multinational corporations that plan to invest in green industry projects in China or are dedicated to promoting the development of green industry in China; (d) the information disclosure system shall be established for green corporate bonds, covering the category, identification basis or standard, environmental benefit target of bonds issued; and (e) green certification is favored. Entities issuing green corporate bonds are encouraged to submit an assessment opinion or certification report concerning targeted green industry projects provided by independent professional assessment or certification bodies. The Guiding Opinions also included provisions on cooperation between underwriting agencies and green industry, public-welfare green bonds, and green investment culture. In June 2017, the People's Bank of China (PBoC), China Banking Regulatory Commission (CBRC), CSRC, China Insurance Regulatory Commission (CIRC) and Standardization Administration jointly released the *Plan for the Development of Standardization System for the Financial Sector (2016–2020)*, listing "green financial standardization" in the five major projects to vigorously promote standardization of green finance in the country.

2.2 Full advancement of green finance pilots

The pilot zones for reform and innovation of green finance are a major innovation in the practice of green finance. Through the pilot, replicable "green finance samples" will be fostered in the pilot zones, laying the foundation for comprehensively deepening and promoting green finance.

Deployment of pilot zones for green finance made by the State Council. Premier Li Keqiang decided, at a State Council Executive Meeting he chaired on June 14, 2017, to set up pilot zones for green finance in some provinces (regions) to support green economic transformation and upgrading. According to the meeting, the pilot zones with different focuses and distinctive features will be located in Zhejiang, Jiangxi, Guangdong and Guizhou provinces, as well as Xinjiang Uygur Autonomous Region and expected to explore replicable experience in institutional mechanisms. The major tasks for the development of green finance were also clarified, including: (a) supporting financial institutions to set up green finance departments or branches, and encouraging micro-credit companies and financial leasing companies to engage in green finance business; welcoming domestic and foreign capitals such as venture capital and private equity to participate in green investments; (b) encouraging the development of green credit, which takes into account franchise rights, project proceeds, emission rights and other environmental credentials; accelerating the development of green insurance, such as innovative products for environmental responsibility insurance; supporting green businesses to finance by issuing bonds and getting listed, including issuing green debts



for small and medium-sized enterprises (SMEs); increasing the support of green finance for green buildings and green infrastructure in small and medium-sized cities and special small towns; (c) exploring the establishment of markets for trading environmental rights, such as emission, water and energy rights, establishing an information sharing platform for pollutant discharge and environmental violation records of enterprises, and a green credit system; promoting the use of green payment tools such as electronic drafts and mobile payments and the construction of financial infrastructure such as green ratings and indices; (d) providing more support on fiscal tax, land and personnel policies, and giving priority to green industries and projects in government service channels; increasing the support of local government bonds for public-welfare green projects; improving the mechanism of sharing risks and costs through such measures as relaxing market access and pricing public services; (e) establishing a risk prevention mechanism for green finance and a risk compensation mechanism for investment and financing of green projects in accordance with the law and improving the accountability system to foster a model for healthy development of green finance. On June 27, 2017, seven ministries and commissions including PBoC, National Development and Reform Commission (NDRC) and Ministry of Finance (MOF) issued the schemes for green finance pilots in Jiangxi and other places, providing policy support for green finance pilot zones.

Push of pilot zones for the development of green finance. Zhejiang Province made an overall arrangement for the green finance pilot zone. The dedicated meeting chaired by Governor Yuan Jiajun on June 29, 2017

clarified the strategic positioning of Huzhou and Quzhou cities in the development of green finance: Huzhou focuses on financial support for innovation and upgrading of green industries, while Quzhou focuses on financial support for green transformation of traditional industries. Guangzhou City advanced strategic planning for green finance by prioritizing it in the *Development Plan for Guangzhou's Regional Financial Center (2011–2020)*, the *Three-Year Plan for Building a Modern Financial Service System in Guangzhou (2016–2018)*, and the *13th Five-Year Plan for the Financial Sector in Guangzhou (2016–2020)*. Aiming at "a pilot zone for green finance reform and innovation, a demonstration zone for the coordinated development of green finance and green industry, a new platform for promoting the cooperation and development of the bay area of Guangdong, Hong Kong and Macau, and a booster to the Belt and Road Initiative," the pilot zone construction will concentrate on and start from Huadu District and contribute a Guangzhou model for green finance through multi-pronged measures, such as innovating mechanisms, gathering institutions, developing products and improving services. Jiangxi Province will initially build, in about five years, a green financial service system that features sound organizational structure, rich product services, complete infrastructure, and stable and safe operation, centering on the main thread of financial support for the development of green industry and for green transformation and upgrading of pillar industries in Ganjiang New District. Guizhou Province plans to establish a green financial service system with wide radiation and strong influence in about five years through pilot project in Gui'an New District, so as to promote the coordinated progress in ecological civilization construction and green



finance innovation in the pilot area. Xinjiang will pilot the innovation of green finance in Hami, Changji and Karamay to gradually raise the proportion of green credit, green bonds and green equity in social financing in five years or so, and deliver replicable experience based on the exploration.

Development of policies and systems in support of green finance by local governments. First, local development plans for green finance have been gradually in place. The Beijing Municipal Bureau of Finance and other seven departments jointly issued the Implementation Measures for Building a Green Financial System for the Capital City on October 10, 2017. The document pointed out the strategic direction for green finance by setting out 19 measures, including the establishment of a green financial system, strengthened innovation of green finance in the banking sector, development of green guarantees and green micro-loans, support for the listing of green enterprises for financing and refinancing, development of green bonds, introduction of green asset securitization products, cultivation of green institutional investors, support for PPP model in green projects, creation of green finance functional areas, and establishment of a reserve mechanism for green projects. Multiple departments and commissions of Chongqing

Municipality released the *Green Finance Development Plan for Chongqing (2017–2020)* and the Action Plan for *Accelerating the Development of Green Finance in Chongqing (2017–2018)* in October 2017, providing policy support for the development of green finance in the city, with focus on low-carbon industries and water resources protection. Second, local systems supporting green finance have gradually taken shape. In June 2017, Gansu Bank set up the department of green finance to support green financial development in Gansu Province. The department specializes in green finance, and undertakes the research on industrial policies in green finance related fields, the innovation and management of business products, the formulation of comprehensive service plans, and the development of management systems and processes. On October 16, 2017, the Green Finance Tribunal of Guanshanhu District People's Court of Guiyang City was established as the first of its kind in the country. Using a big data platform for information sharing, the following functions will be enabled: one-click case activation, evidence preservation in the cloud, remote data transmission, information coverage and stocktake of the whole trial procedures, multi-party information sharing, online Internet court and offline physical court.



III. DIVERSE PRODUCTS AND ACTIVE PRACTICE

Innovative green financial products are an important carrier of green finance. China has made considerable progress in the products and services of green finance, such as green credit, green bonds, green funds, and carbon finance. Relying on continued innovation in products and services, the green financial market becomes increasingly active.

3.1 Steady growth in green credit

Sustained growth in the size of green credit. In the first half of 2017 (as of June 30), the outstanding green credit of 21 major Chinese banks stood at 8221.968 billion yuan, of which the number read 6531.263 billion yuan for energy conservation and environmental protection services and 1690.705 billion yuan for strategic emerging industries. As shown in Figure 4, the top five of outstanding green credit were green transport projects (3015.167 trillion yuan, 36.67%), renewable energy and clean energy projects (1610.317 trillion yuan, 19.59%), emerging new energy industry (835.347 billion yuan, 10.16%), and strategic emerging industry of energy conservation (802.049 billion yuan, 9.75%). In addition, the green credit was adequate for waste disposal and pollution prevention & control (372.290 billion yuan, 4.53%) and nature conservation, ecological restoration and disaster prevention & control (337.899 billion yuan, 4.11%), but limited for green agriculture development

(53.603 billion yuan, 0.65%), green forestry development (44.698 billion yuan, 0.54%), energy conservation and environmental protection services (67.218 billion yuan, 0.82%), and new energy vehicles (53.308 billion yuan, 0.65%).

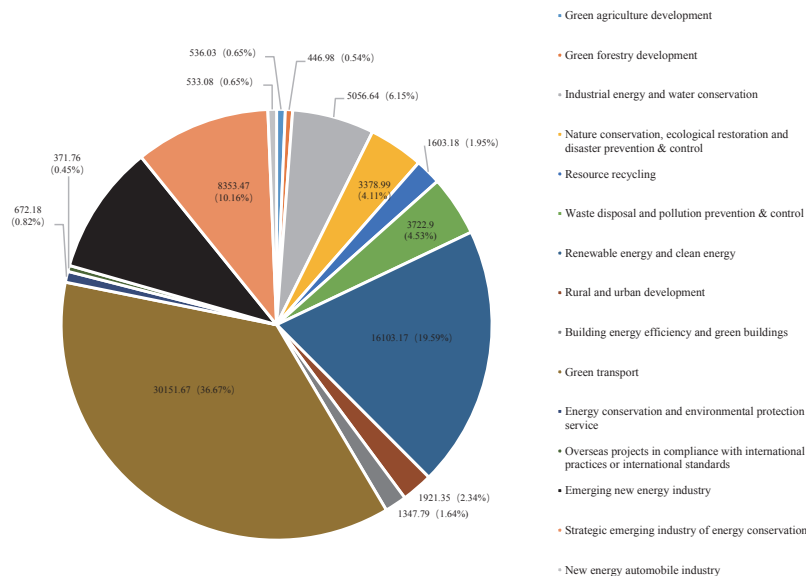
3.2 In-depth advancement of green bond market

Guidelines issued by PBoC and CSRC to regulate green bond assessment and verification. On October 26, 2017, PBoC and CSRC jointly released the *Guidelines for Green Bond Assessment and Verification Activities (Provisional)* to supervise the activities and improve the quality of green bond assessment and verification and promote the sound development of green bond market. The Guidelines set out requirements for (a) verifier qualifications. Verifiers shall have established the organizational structure, work flow, technical methods, fee rates and quality control necessary for green bond assessment and verification, as well as the qualifications for practice in the rating, certification, identification, energy and climate fields; (b) business undertaking. Verifiers shall grasp macro policies about green industry and green bond assessment and verification, have qualifications and professional capabilities in laws and regulations, and

* ² These 21 major banks include the China Development Bank, China Exim Bank, Agricultural Development Bank of China, Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China Limited, China Construction Bank, Bank of Communications Co., Ltd, China CITIC Bank Corporation Limited, China Everbright Bank Co., Ltd, Hua Xia Bank Co., Ltd, Shanghai Guangdong Development Bank, Shenzhen Development Bank Co., Ltd, China Merchants Bank Co., Ltd, Shanghai Pudong Development Bank, Industrial Bank Co., Ltd, China Minsheng Banking Corporation Co., Ltd, Evergrowing Bank Co., Ltd, Zheshang Bank, China Bohai Bank Co., Ltd, and Postal Savings Bank of China. The illustration is based on the latest official data published by CBRC as of June 30, 2017.



■ Figure 4 Outstanding green credit of 21 major banks by categories (2017Q1)



Source: CBRC, data as of June 30, 2017.

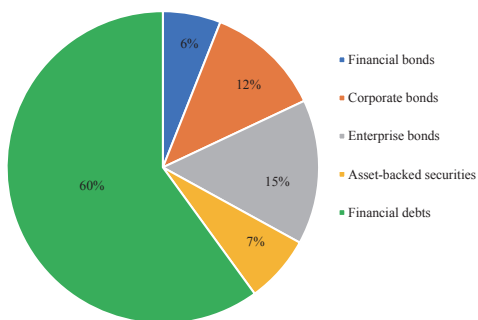
meet the requirements regarding fees for green bond assessment and verification; (c) business operation. Green bond assessment and verification shall take into account the compliance of proposed projects, screening and decision-making system for green projects, management system for proceeds, information disclosure and reporting system of green bonds, and expected environmental benefits of green projects; (d) reporting. A report should include the basic information of green bonds and the description of implementation, instruction and conclusions of assessment and verification; and (e) supervisory management. Rules were stipulated for self-examination and peer review of verifiers and for administrative penalties.

Stable development in the overall and local issuance of green bonds. In 2017, China issued 123 green bonds worth 248.6777 billion yuan in domestic and overseas markets, an increase of 7.55% year on year, representing about 25% of global green bonds issued during the same period. The issuance included financial bonds, enterprise

bonds, corporate bonds, medium term notes, short-term financing bonds and asset-backed securities. As shown in Figure 5, financial bonds formed the majority (60%) of green bonds issued in 2017; enterprise bonds and corporate bonds accounted for 15% and 12% respectively; debt financing instruments of non-financial corporations and asset-backed securities took up small proportions of 6% and 7% respectively. As shown in Figure 6, multi-purpose green bonds, numbering 54, took up a larger proportion by value (14.2%) and the figures read 20 and 14.2% for green bonds invested in clean energy. Green bonds were close in the fields of energy conservation, pollution prevention & control, resource conservation and recycling, clean transport, and ecological protection and climate change adaptation. In terms of regional distribution, as shown in Figure 7, Beijing exhibited the largest issuance of 93.5 billion yuan, accounting for 37.6% of the total, followed by Shanghai and Jiangsu (22.0 billion yuan and 18.05 billion yuan respectively). In most areas the size of issuance was less than 5 billion yuan.

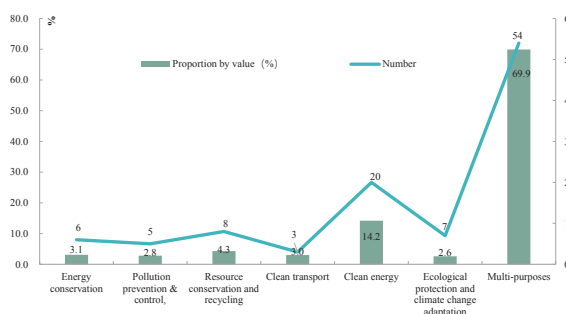


Figure 5 Structure of China's green bonds issued in 2017 (size)



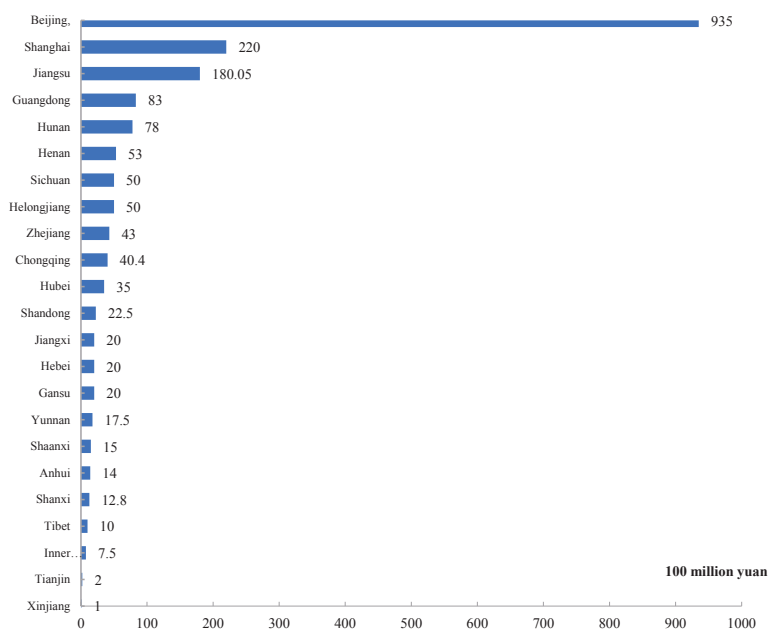
Source: China's Green Bond Market Development and Outlook 2017

Figure 6 Proportion and number of China's green bonds issued in 2017



Source: International Institute of Green Finance, Central University of Finance and Economics (CUFE-IIGF)

Figure 7 Regional distribution of China's green bonds issued in 2017



Source: CUFE-IIGF

Driver and torchbearer of the global green bond market. With further promotion of green finance, China comes into prominence with an increasingly important role in leading the global green bond market. In September 2017, the Luxembourg Branch of the Industrial and Commercial Bank of China (ICBC) issued the first Belt and Road Green Climate Bond

denominated in dollar and euro to finance green credit projects on low-carbon and low-emission transport, energy efficiency, renewable energy, and sustainable water management. The issuance of 2.15 billion US dollars represented the largest single-tranche EUR-denominated green bonds by a Chinese issuer, the first deal of green bonds that meets



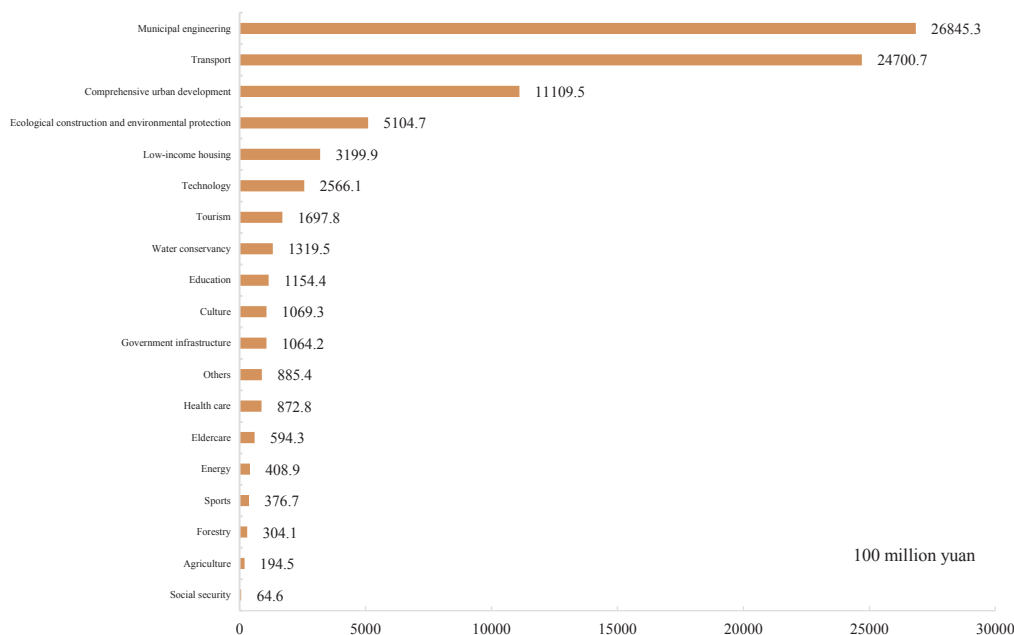
the latest international and domestic standards, and the first deal of green bonds on green projects along the Belt and Road. In November 2017, the Paris Branch of the Bank of China (BoC) succeeded in the issuance of Green Climate Bonds denominated in euro, dollar and yuan, with an amount equivalent to 1.5 billion U.S. dollars, marking the first Chinese-funded climate bond listed in Paris.

3.3 Expanding green funds

Green funds give an important boost to green industry. Green funds can effectively pool the funds of governments, enterprises and financial institutions to form multi-source adequate funds. At present, the green funds in support of green industry include government funds, private equity, venture capital, and various special funds. As international cooperation deepens, green funds have become an important carrier of China's international financial cooperation.

Government and social capital cooperation to support green funds. PPP has evolved into the main model for government and social capital cooperation to promote the financing for green industry. According to existing statistics (Figure 8), the announced PPP projects nationwide amounted to 8.36 trillion yuan by the end of November 2017, of which the new entrants in 2017 reached 3.96 trillion yuan, so the PPP market has experienced rapid growth. In terms of cumulative turnover, the top five categories of PPP projects are municipal engineering (284.553 billion yuan), transport (2470.07 billion yuan), comprehensive urban development (1110.95 billion yuan), ecological construction and environmental protection (510.47 billion yuan), and low-income housing (311.99 billion yuan). Apparently, ecological construction and environmental protection forms an important part of the PPP projects.

■ Figure 8 Cumulative turnover of PPP projects by sectors



Source: Published information online, data by the end of November 2017.



A variety of green development funds and special funds to support green finance. This year, green development funds continued the effective performance in the field of green finance with the launch of various green funds. In November 2017, Shanghai China CEFC Energy Co., Ltd. and Yiling District People's Government signed an agreement to set up a green development fund of three billion yuan for the Three Gorges Reservoir (Yiling). The initial contribution, worth one billion yuan, will be used to support projects for water environmental governance and waste disposal in the district. In November 2017, China Beijing Environment Exchange (CEEEX) and U.S.-China Green Fund jointly launched the carbon fund with a total size of 10 billion yuan in the Xiong'an New District. The fund will invest in high-quality projects in low-carbon green sectors both at home and abroad to accelerate the progress in green energy, energy conservation and environmental protection, and green smart cities and villages. It will assist green development funds in the quantification, collection and commercialization of carbon assets in the national emissions trading market. In addition, special funds also contributed to the development of green finance. In November 2017, Huzhou City of Zhejiang Province announced to arrange annually a special fund of one billion yuan to encourage reform and renovation of green finance in the pilot zone.

3.4 Breakthroughs in the emissions trading market

The emissions trading scheme (ETS) is an important market-oriented instrument to reduce carbon reductions. In 2017, the national carbon market was officially open, marking China's entry into a new era of emissions trading. The markets in seven pilot areas,

including Beijing and Shanghai, advanced and witnessed a stable increase in the trading volume and turnover of allowances.

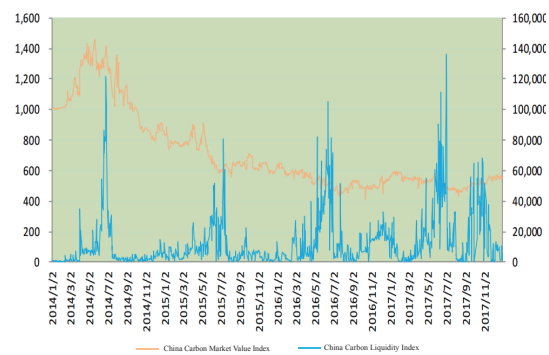
Power generation sector to become a leader of the national carbon market. The *Program for Building a National Emissions Trading Market (Power Generation Sector)* was released by NDRC on December 19, 2017, marking the official launch of the nationwide carbon market, with the power generation sector as the starting point. The Program defined the elements and participants of the carbon market. In the initial stage, transactions will be mainly conducted among key emission entities in the power generation sector and limited to allowances spot. A unified, interoperable and strictly regulated emissions trading system will be established and integrated into the management of national public resources trading platforms. Participants in the transactions can be grouped into key emission entities, regulatory authorities and verification agencies. Among them, key emission entities refer to enterprises or other economic organizations in the power generation sector whose annual emissions exceed 26,000 tons of carbon dioxide equivalent (annual comprehensive energy consumption, about 10,000 tons of coal equivalent). Regulatory authorities are NDRC and its related departments, and verification agencies shall meet the principle requirements on functions. The Program also set forth specific requirements for (a) scheme construction, covering the monitoring, reporting and verification system of carbon emissions, the allowance management system for key emission entities, and other market transaction related systems; (b) allowance management for the power generation sector, including allocation and settlement; (c) support systems, including the data reporting system



for carbon emissions of key emission entities, and the registry system, trading system, and settlement system; and (d) the transition of pilot areas and the safeguard measures.

Steady carbon market advancement in seven pilot areas³. In 2017, the annual online and offline spot transactions of allowances in the seven secondary markets (provinces and municipalities) amounted to nearly 67.4 million tons worth 1.181 billion yuan, increases of 5.31% and 13.01% year on year respectively. By December 31, 2017, the cumulative trading volume in these markets reached 182 million tons and the cumulative turnover exceeded 3.6 billion yuan. Among them, Beijing's numbers read 20.13 million tons and 700 million yuan, representing 11.03% and 19.44% of the national total. Hubei saw the largest cumulative trading volume and turnover, standing at 51.29 million tons and 1.0 billion yuan and accounting for 28.11% and 27.37% of the national total respectively. In terms of transaction prices, the market price was most stable in Beijing, with the maximum daily average transaction price of 77 yuan per ton (July 16, 2014) and an annual average transaction price of about 50 yuan per ton during the four years. Great price fluctuations were observed in other regions. The average transaction price was as high as 122.97 yuan per ton in Shenzhen (closing at 130.9 yuan per ton on October 17, 2013) and as low as 1 yuan per ton in Chongqing (May 3, 2017). From the perspective of carbon index, in 2017, the China Carbon Market Value Index mainly stayed between 400 and 600 (Figure 9) in the pilot areas (excluding Chongqing), with the highest of 601.25 and the lowest of 433.68. It is comparable to that of previous year,

■ **Figure 9 Carbon index changes over the years**



Source: CBEEEX, Annual Report on Beijing Carbon Market 2017

but more stable than that of 2014 and 2015. The China Carbon Liquidity Index changed significantly, especially during May-August.

3.5 Rise of various green financial products from ashes

Green financial products and services were diversified along with the steady growth of traditional products and services. China successfully issued its first green asset-backed notes, first financial leasing green bonds, and first green asset-backed securities for the renewable resource recycling industry. This demonstrates that green finance gains growing influence with the expansion of fields and products.

Successful registration of China's first green asset-backed notes. In April 2017, Beijing Enterprise Water Group (China) Limited (BEWG) issued its first green asset-backed notes (ABN), also the first of the kind in the country, in the interbank market. The 2.1-billion-yuan ABN, with an initial tranche of 2 billion yuan, is divided into levels 1-6 and secondary level of senior tranches. China

*³ Note: The following data are sourced from CBEEEX, Annual Report on Beijing Carbon Market 2017.



Bond Insurance Co., Ltd as a third-party credit insurer, pays for differences in the principal, expected benefits and redemption payments of the senior tranches. The ABN is rated AAA by Shanghai Brilliance Credit Rating & Investors Service Co., Ltd. The interest rate for the first level of senior tranches is 3.8%, the lowest interest rate among similar products of the same period. The proceeds will be earmarked for green projects such as environmental improvement and climate change. BEWG Green ABN, known as China's first green asset-backed note, marks the largest-scale securitized product with the most underlying assets in the field of water business.

Successful issuance of China's first financial leasing green bonds. In June 2017, CPIC Ronghe Financial Leasing Co., Ltd. registered with approval the debt financing instrument for non-public offering in 2017, wherein the Industrial Bank serves as the lead underwriter. The principal-protected notes (PPN) amounted to 2 billion yuan with a term of 3 years. The proceeds will be invested in wind power, hydropower and solar power generation projects which are expected to produce benefits in energy conservation and emissions reduction, energy mix optimization, soil and water conservation, resilience to natural hydrological hazards, local environment microclimate improvement, and economic sustainable development. By relaxing the requirements for net assets and age of enterprises, the PPN model lowers the threshold for participation in green projects, enlarges the scope and relatively simplifies the procedures for registering green bonds. Moreover, non-public offering is superior in attracting risk seeking investors and diversifying investor groups and conducive to resolving the financing predicaments of

various enterprises and strategic emerging industry issuers in the traditional indirect financing and public direct financing, creating more possibilities and space for green finance. The issuance marks China's first financial leasing green bonds in the interbank and exchange markets.

Successful issuance of multiple green asset-backed securities in the exchange market. In August 2017, Green Park Science & Technology Co., Ltd of China Gezhouba Group successfully issued with approval the first phase asset-backed special plan for green receivables at the Shanghai Stock Exchange after verified by Lianhe Equator Environmental Impact Assessment Co., Ltd. The issuance of 1.304 billion yuan is all backed by green assets and will be invested in green projects. It marks the first green asset-backed securities for renewable resource recycling industry and in Guangdong province. In September 2017, Qingdao TGOOD Electric Co., Ltd successfully raised 982.87 million yuan through its first phase asset-backed special plan for green receivables. The three-year special plan represents the first green asset securitization project in Shenzhen Stock Exchange. In November 2017, Harvest Capital Management Co., Ltd and China Energy Conservation and Environmental Protection Group (CECEP) brought China's first green commercial mortgage-backed securities (CMBS) verified by an independent third party to the market at the Shenzhen Stock Exchange. With green buildings as the underlying asset, the CMBS issuance reached 820 million yuan with a term of 12 years. The prime securities are rated AAA and the interest rate is 5.2%, a relatively lower level among securities products of the same period.



VI. STRENGTHENED COOPERATION AND COMMON DEVELOPMENT

International cooperation has opened up space for China's green finance. The Hamburg G20 Summit put, following the 2016 Hangzhou G20 Summit, green finance on the agenda, creating an opportunity for all countries to forge a consensus on green finance. With continued implementation of the Belt and Road Initiative, green investments will further scale up, and the influence of exchange and cooperation on green finance through broader channels be enhanced.

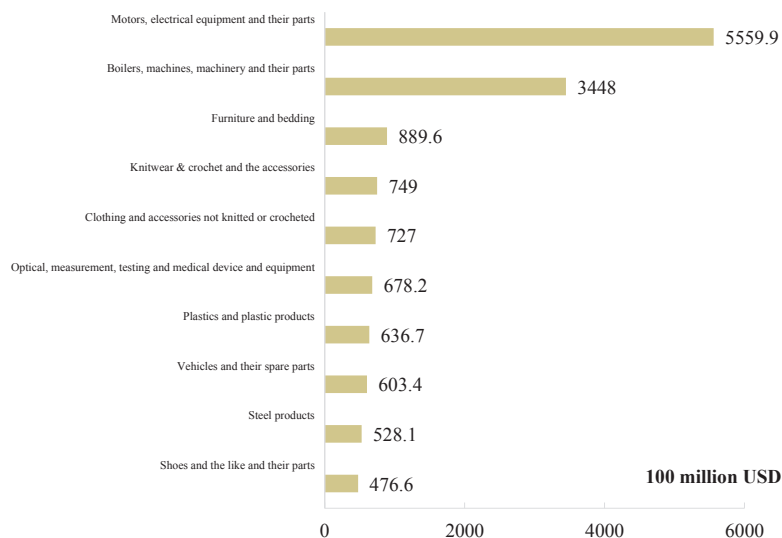
Inclusion of green finance into the Hamburg G20 Summit. Following the Hangzhou G20 Summit, the 12th Meeting of the Group of Twenty held in Hamburg, Germany during July 4-8, 2017 again discussed green finance and wrote the initiative for encouraging environmental risk analysis in the financial sector and improving the availability of publicly available environmental data for financial analysis into the G20 Hamburg Action Plan, laying a good foundation for international cooperation on green finance. As an important outcome of the discussions, the *G20 Green Finance Synthesis Report 2017* systematically expounded environmental risk analysis, publicly available environment data, and green finance progress. It suggests for environmental risk analysis, financial institutions consider (a) risk types (e.g., market, credit, business); (b) the risk factors financial institutions are exposed to (e.g. physical or transition risks); (c) the size of direct and indirect exposure to the specific environmental risks; and (d) key country/sector-specific factors. Recognizing the importance of environmental data, the report broadly groups publicly available environment data into (a) historical physical trends, (b) forecasts and forward-looking scenarios, and (c)

costs of pollution and benefits of remediation. In addition, the China model is illustrated for international green finance practice, including national sustainable and green finance roadmap. International cooperation in green finance has been evident across the G20 and between the G20 countries. Through the international platform of the G20 Summit, China has further enhanced its international influence and created opportunities for international cooperation among nations in the field of green finance.

Promotion of green investments in the Belt and Road Initiative. The Belt and Road Initiative is an important strategic concept for China more open to the outside world. It meets the needs of domestic element flow and international industrial transfer and conforms to the transformation of international economic and trade cooperation and mechanisms, creating opportunities of strategic importance for the development of China and other countries in the world. According to statistics, the GDP of the 64 countries along the Belt and Road amounted to about 12 trillion US dollars and foreign trade 7.18855 trillion US dollars, accounting for 16% and 21.7% of the global total respectively. China's trade with these countries (Figures 10 and 11) included enormous exports of motors, electrical equipment and their parts (555.99 billion U.S. dollars) and large imports of fossil fuels, mineral oils and their distillation products (110.99 billion U.S. dollars). Green investments have been important to the Belt and Road Initiative, though difficult to accurately identify, and will give a great stimulus to China's ecological civilization construction and global sustainable development.



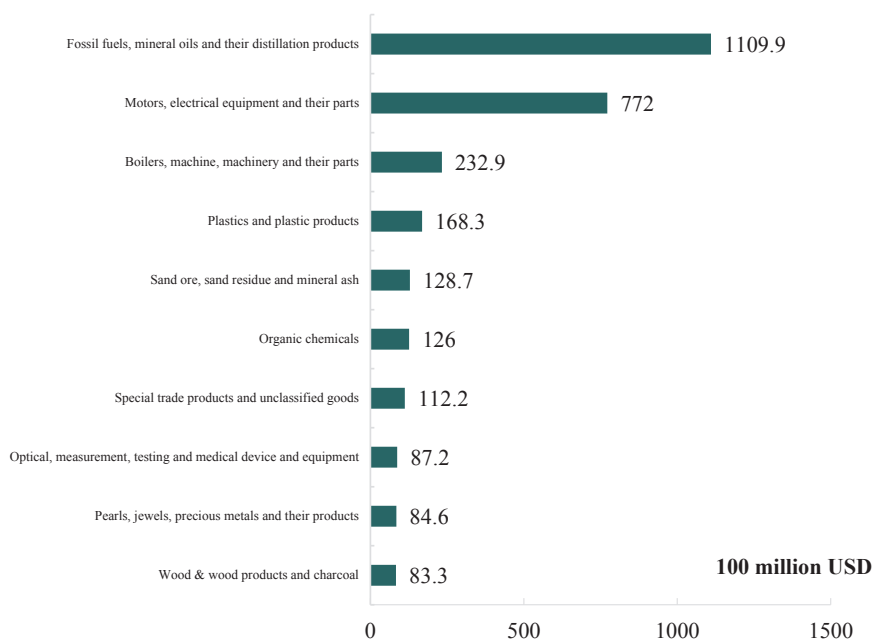
■ Figure 10 China's top 10 exports to the world in 2016



Source: State Information Center (SIC), Big Data Report of Trade Cooperation under the Belt and Road Initiative 2017.

Note: The statistics can only be updated to the year 2016 due to data unavailability.

■ Figure 11 China's top 10 imports from the world in 2016



Source: SIC, Big Data Report of Trade Cooperation under the Belt and Road Initiative 2017

Note: The statistics can only be updated to the year 2016 due to data unavailability.



Expanding impact of international exchanges in green finance. China has witnessed increasing exchange and cooperation in green finance with the international community. A variety of green finance activities, including delegation exchange visits and high-standard summits, have created platforms for China's cooperation with other countries while improving China's international influence. From March to April 2017, a green finance delegation of the Latin America and the Caribbean countries, organized by the Inter-American Development Bank, came to China and visited the Chongyang Institute for Financial Studies and its Ecological Finance Research Center at the Renmin University of China, China Financial Information Center, and CECEP. The exchanges focused on China's policy formulation and local practice for green finance, green development of the Belt and Road Initiative, and overseas business development of green finance in recent years. This visit has laid a foundation for building a diversified inter-regional docking platform and pushing forward international exchange and cooperation in green finance. In September 2017, a high-level delegation of the Mongolia Government paid a visit to China

with focus on China's typical practices on the road of green development. They conducted field investigations on best practices of environmental governance and green finance in Tianjin Haihe River comprehensive water management, Sino-Singapore Tianjin Eco-City and the world's largest solar photovoltaic glass manufacturing enterprises, Ordos New Energy Industrial Demonstration Zone, and Engebei Desert Ecological Management Demonstration Zone. In addition to such visits, large international forums also contributed to China's growing influence in international green finance practice. In March 2017, the 2017 Lujiazui Green Finance Forum, supported by CSFB-CFC, PBoC Shanghai Head Office and Shanghai Municipal Office of Finance, took place in Shanghai, offering a platform and channel for global exchanges and cooperation in green finance. In April 2017, the 2017 CSFB-CFC Annual General Meeting & China Green Finance Summit was held in Beijing, where dozens of experts and scholars from international agencies, such as the German Agency for International Cooperation (GIZ) and the United Nations Environmental Programme (UNEP), showed up and conducts exchanges.



V. CONCLUSIONS

Green finance injects an important impetus to promoting green and low-carbon development and building an ecological civilization. China witnessed considerable progress and full acceleration of green finance in 2017. This report summarizes these latest developments of green finance in four aspects: market demand, policy design, product innovation and international cooperation.

First, the green financial market is closely linked to the environmental protection market. The faster move to control environmental pollution when building an ecological civilization further unleashed the potential of environmental protection market. Due to the expansion of the EPC application and the continued emergence of such innovative services as eco-managers and eco-hospitals, the environmental protection market maintained the momentum of innovation-driven rapid growth.

Second, green finance has entered a stage of accelerated development in an all-round way. The development of green finance has become a national strategy when written into the Report to the 19th CPC National Congress. The CPC Central Committee and the State Council have proactively rolled out a series of policy plans for the innovative development of green finance. With the establishment of pilot zones, local governments took the initiative to put in place systems in support of green finance, laying solid institutional and policy foundation for the overall accelerated development of green finance.

Third, product innovation continued to enrich green finance. The green bond market made headway; the markets of green bonds, green credit and carbon finance saw expansion; and the PPP-dominated green funds and special funds provided financial support for the environmental protection industry.

Fourth, international cooperation has opened up space for China's green finance. The integration of green finance into the agenda of Hamburg G20 Summit created an opportunity for countries to build consensus on green finance. As green investments will further swell with the advancement of the Belt and Road Initiative, the channels for exchanges between China and other countries will be broadened, raising the influence of exchange and cooperation in green finance.

Looking ahead, under the leadership of Xi Jinping Thought on Socialism with Chinese Characteristics, China will embrace a brighter future and a broader space for green finance. There are still tremendous room for development and innovation in various fields, such as green development fund, fiscal subsidies on interest payments for green credit, green guarantee mechanism, environmental stress testing, green bonds for medium- and long-term financing, green index, green insurance, carbon finance market and international green finance cooperation. It is believed that China will accomplish greater achievements in green finance under the guidance of new ideas for the new era, with the concerted efforts of experts, scholars and entrepreneurs in financial and environmental fields.



REFERENCE

- 1 WENG Zhixiong, GE Chaizhong, DUAN Xianming, et al. Comparative Study of Green Financial Products at Home and Abroad [J]. Chinese Journal of Population, Resources and Environment, 2015,25 (6): 17-22.
- 2 WENG Zhixiong, GE Zhaozhong. Top-level Design and Innovative Development of Green Finance [J]. Chinese Journal of Environmental Protection, 2016, 44 (20): 47-51.
- 3 GE Zhaozhong, WENG Zhixiong, DUAN Xianming. Green Financial Policies and Products: Status Quo and Suggestions [J]. Chinese Journal of Environmental Protection, 2015 (2): 32-37.
- 4 WENG Zhixiong, MA Zhongyu. International Cooperation Process, Challenges and China's Actions for Global Climate Governance [J]. Chinese Journal of Environmental Protection, 2017,45 (15): 61-67.
- 5 MA Jun. Establishment and Development Opportunities of Green Financial System [J]. Chinese Journal of Financial Development Research, 2017: 1-5.
- 6 LI Mei, DING Hui. Study on Establishment of Green Financial System Under the Framework of the Belt and Road Initiative [J]. Chinese Journal of Environmental Protection, 2016 (19): 31-35.
- 7 JIANG Xianling, ZHANG Qingbo. Summary of Green Finance Theories and Practices in Developed Countries [J]. Chinese Journal of Population, Resources and Environment, 2017 (S1): 323-326.
- 8 State Information Center. Big Data Report of Trade Cooperation under the Belt and Road Initiative 2017 [R]. Beijing, 2017: 1-69.
- 9 G20 Green Finance Study Group. G20 Green Finance Synthesis Report 2017 [R]. Beijing, 2017: 1-35.
- 10 Green Finance Study Group of China Financial Information Network. China's Green Bond Market Development and Outlook 2017 [R]. Beijing, 2017: 1-26



Prof. Wang Jinnan

Prof. Wang Jinnan, is the president of Chinese Academy for Environmental Planning (CAEP), the academician of Chinese Academy of Engineering (CAE). He is also the director of the State Key Laboratory of Environmental Planning and Policy Simulation, the core expert of three National Key Science and Technology Programs, the member of the National Science and Technology Commission of Environmental Protection, and the vice president of Chinese Society for Environmental Science. He works as chief editor and serves on the editorial

board of eight core journals in the field of environmental science. Prof. Wang Jinnan is mainly engaged in environmental planning and policy research over last three decades. Since 1988 he has published 13 monographs, such as *Environmental Planning* and *Environmental Economics*, and over 300 academic papers. He has been awarded as the first national hundreds of talents, the national professional leader in environmental science and technology, the leading Chinese youth of science and technology, the green China special figure, and the State Council leading expert. He has also received more than 20 scientific and technological research awards at national and ministerial level.



Chinese Academy of Environmental Planning

8 Dayangfang, BeiYuan Road, Chaoyang District, Beijing 100012, China

Editor in chief: Prof. WANG Jinnan

President, Chinese Academy for Environmental Planning

Contact person: Mr. ZHANG Hongyu

Tel: 86-10-84917585

Fax: 86-10-84918581

E-mail: zhanghongyu@caep.org.cn

Web: www.caep.org.cn