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AIIB – Asia Infrastructure Investment Bank

BRIC – Brazil, Russia India and China

CAF – Development Bank of Latin America

CBI – Climate Bond Initiative

CBRC – Chinese Banking Regulatory Commission

CDB – China Development Bank

CELI – Compulsory environmental liability insurance

CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act

CNY¥ – Renminbi (official currency of the People's Republic of China)

CSRC – China Securities Regulatory Commission

CIRC – China Insurance Regulatory Commission

DEFRA – Department for Environment, Food and Rural Affairs

EPA – Environmental Protection Agency

EU-ETS – European Union Emissions Trading System

FTSE – Financial Times Stock Exchange

GDP – Gross Domestic Product

GHG – Greenhouse gas

GIB – Green Investment Bank

G20 – Group of Twenty

IPO – Initial public offering

MEP – Ministry of Environmental Protection

MRV – Monitoring, reporting and verification

NDB – New Development Bank

NDRC – National Development and Reform Commission

NEEQ – National Equities Exchange and Quotations

NGO – Non-governmental organization

NPL – Nonperforming loan

PBOC – Peoples' Bank of China

PPP – Public-Private-Partnership

SEPA – State Environmental Protection Administration

SETC – State Economic and Trade Commission

SME – Socialist Market Economy

SPV – Special Purpose Vehicle

UNEP – United Nations Environment Programme

UNEP-FI – United Nations Environment Programme Finance Initiative

Key Findings and Recommendations

Key Findings

1. Developing a Strategic Framework for China's Green Finance Reform

The ultimate purpose of green finance reform is to green the entire financial system and mobilize private capital towards green investments and away from resource-intensive and pollution-intensive investments. China's strategic framework for green finance reform contains four parts: China's national development strategy and goals, its "supply" of green finance (institutions and instruments), the "demand" for green finance (investment needs and effective demand), and enabling system conditions. The four elements constitute a holistic, inter-related system and changes in one part will lead to changes in the other parts. The government's vision for development and environment sets the overall framework, but the enabling (or "driving") conditions are the keys for converting investment needs into actual demand for finance. The starting point is to establish the right enabling conditions, particularly: 1) the establishment and enforcement of standards relating to environmental protection; 2) setting the proper pricing for resources; and 3) sending the right policy signals.

2. The Five Challenges of Green Finance Reform

Challenge #1: The scale of Chinese green financing needs is large and requires further definition in order to determine the right policy choices

Research conducted by the Task Force demonstrates an enormous need for investment into renewable energy, infrastructure (including environmental infrastructure), soil remediation, industrial pollution control, energy and resource efficiency, and green products. These needs span a range of areas from environmental protection (such as air, water and soil) to the supply of resources (such as water supply and renewable energy production). The Task Force's estimates cover two time periods: 2014-2020 and 2021-2030, with low, medium and high scenarios for each period according to the standards and goals to be achieved. Combining these sums to look at the period from 2014 – 2030, the low scenario requires 40.3 trillion yuan (6.4 trillion USD), the middle scenario requires 70.1 trillion yuan (11 trillion USD) and the

high scenario requires 123.4 trillion yuan (19.4 trillion USD) for 2014-2030.¹A caveat is that there are several additional areas such as ecological conservation, climate adaptation, and marine ecosystem protection which merit further consideration. They could not be included in the scope of estimations for this study due to insufficient information on future development trends and environmental standards.

Challenge #2: The flow of finance in China does not focus on green investment opportunities, resulting a substantial shortage of supply of green finance

According to estimates by the Task Force, an additional 2.8 trillion yuan (440billion USD) in investment would have been required in 2013 to meet existing environmental standards. This large gap is due to the fact that the urgent need for cleaner investment is not transmitted as effective demand to financial institutions. This is partly due to a lack of adequate policies to incentivize demand by enterprises to invest in clean activities. And it is partly due to a lack of familiarity with green investment on the part of financial institutions, and their inability to assess environmental risk. This applies to all sources of finance – banks, stock markets, bond markets, special funds, etc. Therefore, even as the greening of the financial system takes banks as its priority, it must also extend to encompass other channels within the financial system to cultivate a diversified green financial system.

Challenge #3: Green finance lacks a comprehensive legal foundation

Although China has already implemented a number of initiatives in the area of green finance, the legal foundations remain narrow and lacking in some areas. As a result, the Task Force has prepared recommendations for filling some of the key gaps in the legal framework.

Challenge #4: A coordinating mechanism is urgently needed at the central level to guide the development of green finance

The scope of green finance reform involves a wide range of agencies, but China currently does not have a mechanism to coordinate green finance initiatives and policies across the full scope of government.

Challenge #5: The need for a strategic road map

¹The development goals and investment costs for the category of green products are highly uncertain for the period of 2021-

Green finance reform is a comprehensive project that will transform the financial system in stages. At present, the process lacks a clear road map. The Task Force proposes the formulation of such a road map that will enable rapid progress with careful sequencing.

Key Recommendations

Recommendation #1: Set priorities for the period of the 13th Five Year Plan

Launch a National Green Development Fund. The importance of green finance has been formally recognized within the 13th Five Year Plan coupled with a recommendation to establish a National Green Development Fund. Green industries will need increase in size and scale as well as undergo consolidation to become capable of innovating new technologies and improve their international competitiveness. However, public subsidies on their own cannot deliver the level of finance needed to support such an upgrading of the sector. Further, bank loans have been the primary source of green financing in China, but not all companies can access bank financing. A national fund could provide a valuable link in the financial system by providing equity that can be leveraged to enable access to other financing channels such as bank loans and provide support investments into industry upgrading.

The Task Force recommends establishing a National Green Development Fund with a focus on medium-to-long term equity financing for large-scale projects. The Fund could be established with a goal of reaching 300 billion RMB over time using a combination of various public funds, development funds, and investments from other major financial institutions and companies. Operating with a market orientation under professional management, the purpose of the Fund should not be profit maximization, but rather to operate on a commercially sustainable basis while also delivering public benefits. The Fund also could have the option of developing specialized sector funds as well as funds targeted at specific regions such the strategic economic development zones identified by the government (e.g., Jing-Jin-Ji/Tianjin-Beijing-Hebei area).

Develop long-term sources of finance by promoting green bonds. The trend towards direct financing will grow significantly in the coming 15 years, particularly through the bond market. Bond markets provide long-term and stable capital at a reasonable cost, and are therefore suited to green investments. We recommend that the relevant authorities should: 1) issue guidance on green bonds; and 2) establish a monitoring and evaluation system for green bonds.

Speed the greening of China's banking system. China's financial system relies primarily on indirect financing, and the banking system plays the leading role. Credit will remain the primary source for green financing for the foreseeable future. We recommend to green the

existing banking system by encouraging the establishment of professional departments within banks, establishing green credit targets, incorporating green credit into performance reviews, and strengthening banks' ability to assess environmental risks and opportunities.

Support the development of a green finance risk guarantee mechanism. Establishing risk sharing mechanisms is a vital tool for attracting private capital. We recommend: 1) accelerating the implementation of compulsory environmental liability insurance; and 2) providing fiscal and policy support to the use of credit guarantees through a specialized fund, or other means.

Provide international leadership by incorporating green finance into the agenda of the 2016 G20 summit, and encourage new multilateral finance institutions to support green finance. Many countries around the world are exploring green finance policies. As the chairing country of the G20 in 2016, China should use the G20 platform to proactively share its experience in green finance and enhance the establishment of a green financial system around the world.

Pilot test green finance reforms in one or more strategic economic zones. Successful implementation of green finance reform in a strategic economic zone will speed the flow of finance to local green industries. It will also advance the process of extending green finance reforms to a national level as well as speed China's green economic transformation.

Recommendation #2: Speed the establishment of the enabling conditions for green finance

Establish and enforce increasingly ambitious environmental laws, regulations, and standards. A sound system of environmental regulation is the foundation for generating actual demand for green finance. The system must establish the right incentives and send the correct market signals in order to create space for green industries to be competitive and grow.

Establish the legal basis for investors to undertake their environmental responsibilities. First, the *Commercial Banking Law* should be revised to clearly stipulate the obligation of commercial banks to evaluate, check and monitor the environmental impacts of the projects in which they invest. Second, the *Securities Law* and the *Corporate Law* should be revised to require listed companies and issuers of bonds to disclose environmental information.

Enhance and rationalize the structure of fiscal and tax incentives for green finance and

use limited government funds to catalyze investments. 1) Achieve a greater leverage effect from the use of public funds by enhancing the green credit subsidy mechanism and establish non-tax revenue incentives for green finance; 2) Integrate and systematize environmental special funds from the central budget to achieve greater efficiency in the use of government funds; 3) Consider allowing green bond investors to exempt their interest income from corporate income taxes.

Optimize the pricing and charging structure for green industries. Green projects must provide competitive returns in order to attract and retain private investors. The rules related to pricing and charging structures applied to green investments should be reviewed to ensure that they allow for financially viable and attractive projects.

Recommendation #3: Establish the institutional structure to support green finance

Build a bridge between supply and demand systems. Information flow between environmental protection departments and banks is a significant barrier to the development of green finance. Many banks are not sufficiently aware of environmental developments and are not skilled at evaluating environmental risks or related opportunities. Similarly, many environmental authorities do not have experience with finance. To overcome this barrier, we recommend that: 1) Environmental authorities should establish green finance development team(s) to enhance their ability to effectively communicate environmental information to the financial sector. 2) One Bank, Three Commissions should establish new structures to catalyze the innovation of green finance products. 3) Qualified universities should be leveraged to establish technical support teams to facilitate the transfer of environmental information into financial information, research policies, and develop green financing tools.

Establish a green finance reform coordinating mechanism at the central level. Green finance requires systemic change and involves many different areas of government. It is necessary to establish a mechanism at the central government level to establish clear roles amongst various agencies, support cooperation, and create integrated green finance policies.

Project Background and Overview

Project Background

The financial system has a key role in supporting the development of an ecological civilization. “Green finance” refers to policies, incentive mechanisms, and institutional arrangements that use financial tools to shift public and private funds into environmentally-friendly investments and away from environmentally damaging investments. China is in the midst of a fundamental transformation of its development model and requires even greater participation from the financial sector in supporting the growth of green industries and the transformation of traditional industry sectors.

China has entered into the period of the “New Normal”. For thirty years, China has maintained an annual growth rate of nearly 10% and has become the second largest economy in the world. However, despite this tremendous success, the natural, environmental, and human resources that have sustained this growth are now under significant pressure. Throughout the country, cities and rural regions are increasingly suffering from haze, air pollution, water pollution, soil contamination, and ecological crises. These changes have surfaced the tensions between economic growth and environmental quality. The path to resolving these problems lies in restructuring China’s industrial base and driving a green transformation of the economy.

Finance lies at the foundation of modern society, and a green economic transformation requires the support of a green financial system. According to calculations by Renmin University of China’s Green Finance Center, an investment of 30 trillion yuan (4.7 trillion USD) will be required between 2014 and 2020 to prevent further environmental degradation and this rises to 123 trillion yuan (19.4 trillion USD) when looking at the period from 2014 to 2030. Yet these calculations do not even include the demands for investments into complex areas such as ecological conservation, climate adaptation, and marine ecosystem protection.

The scale of investment required clearly surpasses the means of public finance alone, and can only be met by leveraging the finance system to attract more investment into green economic growth and such investments as will drive a green transformation. An effective strategy for integrating green finance into the market can allow a limited public funds to mobilize and leverage multiples in private funds to invest into green industries and creating new sources of growth and greening China’s economic structure.

In light of green finance's critical role in support a green economic transformation, the China Council for International Cooperation on Environment and Development (CCICED) convened a task force on the subject of green finance. Renmin University of China and the World Resources Institute have taken the lead in organizing an international Task Force that combines deep knowledge of China's current situation with international experience in green finance. The Task Force was tasked with developing policy recommendations on green finance reform to improve China's environmental protection and control of pollution as part of achieving the goal of an ecological civilization.

Implementation Overview

The project goals were to provide advice on:

- The design of a framework for the structure of green finance that can mobilize a diverse range of investment channels towards green finance and increase the efficiency of green finance;
- New policies that can stimulate innovation in green finance that can enable “green” to become a new source of growth for finance and the environment; and
- How to develop policy framework and roadmap for a green financial system for China.

In order to achieve these goals, the Task Force undertook the following steps:

First, the Task Force studied international practices and theories on green finance to combine the experiences of developed and developing countries, including the United States, the United Kingdom, Australia, the Netherlands, Canada, Switzerland, India, Brazil, and other countries. At the same time, the Task Force also reviewed the work of leading international institutions on green finance, including the United Nations Environment Program, the World Bank, and the Organization for Economic Co-operation and Development.

The project drew particular inspiration from the UNEP Inquiry into the Design of a Sustainable Financial System. The findings of the Task Force are consistent with those of the UNEP Inquiry.

Second, the Task Force analyzed the successful experiences and challenges to date in China's implementation of green finance. The Task Force started by estimating the likely demand for green finance for the periods of 2014-2020 and 2014-2030. Following this analysis of demand, the Task Force reviewed the current status of green finance in banking, capital

markets, insurance, public-private partnerships (PPP) and environmental funds, and carbon finance to identify successful experiences and current challenges.

Third, drawing on international experience and applying it to China's current context, the Task Force worked to develop a framework for the structure of green finance, including researching:

- How to improve the legal and institutional arrangements to support green finance reform;
- How to establish a bridge between supply and demand systems, including recommending the creation of new structures within the Ministry of Environment, the Chinese Securities Regulatory Commission, the Chinese Banking Regulatory Commission, and Chinese Insurance Regulatory Commission as well as leveraging China's university system;
- How to establish a more comprehensive and efficient green financial supply system, including banking, capital markets, insurance, PPP, investment funds, and carbon finance;
- How fiscal policies can best support green financial reform; and
- How to incorporate green finance into China's "Go Global" strategy, including incorporating green finance into the agenda of the G20 summit in 2016 and integrating green finance principles into China's overseas investment.

Finally, the Task Force developed a strategic road map on the basis of its research and recommended three implementation phases.

In the course of preparing its recommendations, the Task Force has tried to find the right balance in its recommendations between a macro-view and a granular assessment as well as articulating the long-term objectives within the context of a staged approach. In all aspects of the recommendations, the Task Force has tried to offer specific and actionable recommendations.

Since the start of the project in March of 2015, the Task Force has held three working meetings, involving individuals from Renmin University of China, governmental institutions

including the Ministry of Environment, the Ministry of Finance, the People's Bank of China, the Chinese Securities Regulatory Commission as well as international experts from leading financial institutions and international organizations, including the World Resources Institute, the United Nations Environment Program, the World Bank, the Organization for Economic Cooperation and Development, and the Climate Policy Initiative. Through this process, the Task Force was able to draw upon a wide range of views and opinions on the subject. In addition to the formal meetings, the Task Force held multiple internal meetings and teleconferences to integrate international experience with an analysis of China's current status to develop a set of policy recommendations that utilize the combined wisdom of Chinese and international experts.

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Chapter I: The Five Major Challenges Facing Green Financial

Reform

1. Greening the Financial System: a Cornerstone of China's Green Transformation

Green finance refers to an innovative financial system that supports the construction of an ecological civilization. China is in the process of implementing its strategy to achieve its eco-civilization construction goals. Financial system reform that stimulates green investment patterns is a critical and necessary pillar to supporting China's eco-civilization goals. Green financial reform includes innovations in institutions, policies, financial markets, and technologies to encourage and incentivize private capital to invest into the green industrial chains, resource efficiency, and environmental protection. Green finance stimulates economic growth, supports low carbon development, and promotes green urbanization to deliver a cleaner environment and higher quality of life.

Green finance is the driver of new areas of economic growth and key to achieving China's green transformation. The "New Normal" (新常态) in China refers to a "great transformation period" (大转化时期) as the Chinese economy shifts from its traditional model of resource-intensive growth to a new model. Developing green industry sectors and promoting the transformation of traditional industry will help drive China's transformation, and offers a valuable new source of economic growth during the "13th Five-Year Plan" period. Green finance plays an important role in enabling the upgrade of China's industrial base and moving the country from being a resource-intensive and pollution-intensive economy to one based on technological innovation.

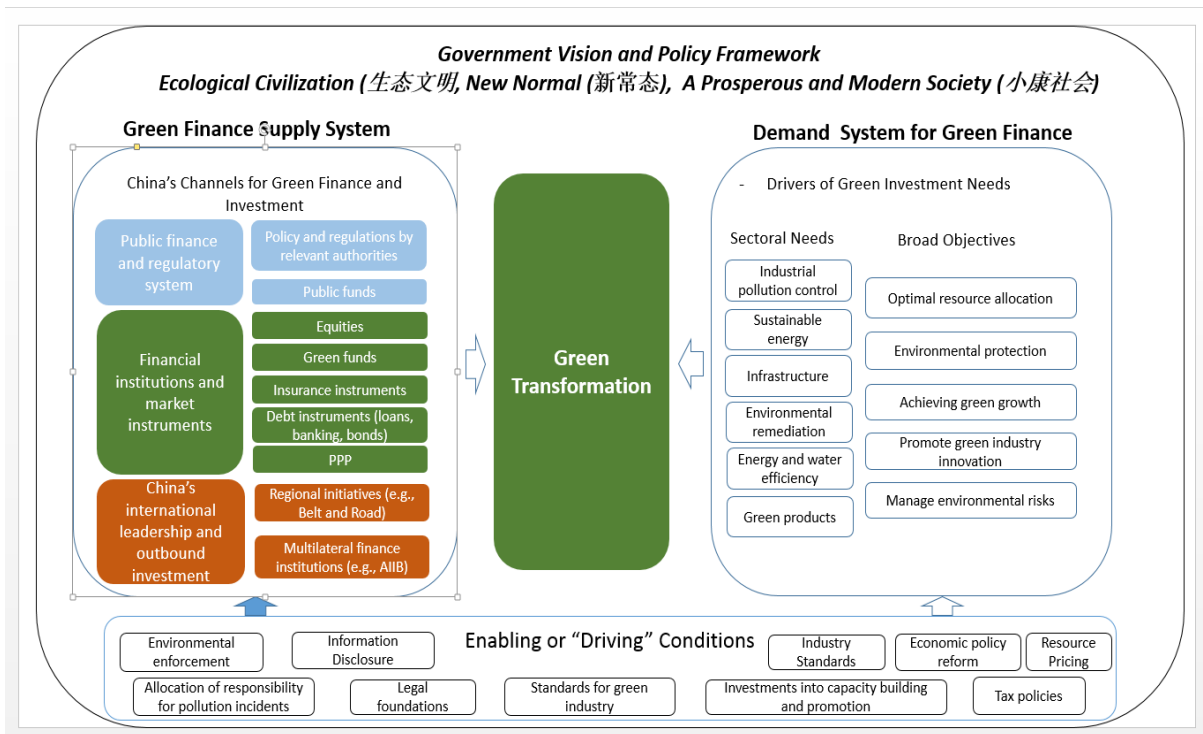
Green finance offers a vehicle for China to incorporate "green" approaches into its international engagement and enhance its international reputation. China's financial system has its own characteristics, and has the opportunity to play a leading role in promoting green financial development and green economic transformation in developing countries through the "Belt and Road" (一带一路) initiative, the Asia Infrastructure Investment Bank (AIIB), Silk Road Fund, and the G20. Helping other countries pursue a path of green growth will bring positive recognition that will enhance China's international reputation.

2. China’s Strategic Framework for Green Financial Reform

China’s green transformation will help enhance long-term national competitiveness, foster new sources of economic growth, safeguard resource security, and improve environmental quality. This transformation is part of constructing an eco-civilization and building a moderately prosperous society (小康社会). However, realizing these goals will require substantial new investments that surpass the resources available from public funds, and can only be achieved by leveraging the financial system to attract private investors. The ultimate objective of green financial reform is to “green” the entire financial system to mobilize substantial new flows of private capital away from “brown” investments and into green investments.

Figure 1.1 shows the framework of green financial reform in China as containing four parts: the national development strategy and goals, the green finance supply system, the demand system, and enabling (or “driving”) conditions. The four elements constitute a holistic, inter-related system and changes in one part will lead to changes in the other parts.

Figure 1.1 Strategic Framework of Green Financial Reform in China



The government’s vision for development and environment sets the overall framework, but the enabling (or “driving”) conditions at the bottom of the chart are the keys for converting

investment “needs” (on the right side of the chart) into actual demand. In designing a greener financial system it is important to remember that this is no substitute for sound environmental policies that will shift investment demand away from environmentally damaging activities and towards sustainable activities. These include the entire set of policies that shift incentives towards environmentally sustainable behavior. The diagram lists a number of enabling conditions, but the key starting points are: 1) the establishment and enforcement of standards relating to environmental protection; and 2) setting the proper pricing for resources. Without the right market signals, companies and other actors will not be motivated to seek financing to invest into environmental protection, which will increase the burden on public finance. Other factors such as capacity-building, technology standards, and information disclosure play important supporting roles in structuring supply and demand, but have a much more limited impact without strong regulations and enforcement.

The supply system of green finance spans banking, equity markets, bond markets, hybrid approaches through investment funds and PPP, and insurance. There are a range of options available to policy-makers that can help stimulate market actors to better recognize the environmental risks around investments or to help create incentives to support the investment case for green investments. Public funds play a critical role where the investment case remains too weak to attract private actors. However, subsidies must be deployed smartly to ensure that limited public funds can leverage their multiples in private capital. They can also both stimulate investments that will remediate existing pollution, and also stimulate investments that reduce the pollution generation and resource consumption baselines, thereby lowering future investment requirements.

The UNEP *Inquiry into the Design of Sustainable Financial System* has identified five essential elements in aligning the financial system to sustainable investment: 1) enhancing market practice; 2) harnessing the public balance sheet; 3) directing finance through policy; 4) transforming culture; and 5) upgrading governance. The CCICED Task Force has benefited greatly from the work of the Inquiry in the course of its research. The Task Force’s recommendations are consistent with themes and directions identified by the Inquiry, and are grounded in the current context of China.

China’s green transformation has evolved from the twin requirements of: 1) achieving emissions reductions to help avoid a global climate change crisis; and 2) the country’s need to reconcile environmental quality and economic growth in the face of China’s massive industrialization and urbanization. While the objective of green financial reform is to green

the entire financial system, the interim steps along this pathway must be tied to the stages of the strategy for China's green transformation. A strong alignment will ensure that the Task Force's recommendations remain practical and feasible to implement and are closely linked with China's broader economic development strategy.

3. Five Major Challenges in Planning China's Green Financial Reform

Challenge #1: The scale of Chinese green financing demand is large, and needs further definition in order to determine the right policy choices

The starting point for developing the right policy recommendations is to first understand the nature of China's green investment needs in terms of the targets of the investment and the amount of finance required. Choices in policies will both influence the development of green finance and also shape the nature of future demand for green investment.

This task force has undertaken to fill that gap with detailed estimates of investment needs for 2014-2020 and 2021-2030 by combining analysis of current policies and standards, forecasts of future policies, and information on China's current environmental conditions, which is detailed in Chapter 2.

Challenge #2: The flow of finance in China does not focus on green investment opportunities, resulting in a substantial shortage of supply of green finance

There is currently an enormous need for green finance in China, and there are large pools of capital within China. In addition, there is a strong interest amongst financial institutions to capitalize in the investment opportunities accompanying China's green transformation. However, due to the imperfect institutional system that supports green finance reform, the huge demand for green financing in China fails to effectively capitalize on the strong willingness of financial institutions on green investment. As a result, the majority of existing finance in China flows to traditional investments, and there is insufficient flow of finance to green investments.

According to the calculations by the task force, investments amounting to 3.6 trillion yuan would have been necessary in 2013 to have halted further environmental degradation, in contrast to the 0.9 trillion yuan that was actually spent from both public and private sources.

There are various reasons to explain such a huge capital gap. First, there has been the lack of

effective demand amongst users of environmental finance. Environmental policies and instruments need to provide sufficient incentive to motivate enterprises and other economic actors to pursue investment. Financial institutions will not pursue green investments if they do not experience client demand or if they are unfamiliar with the specific types of projects.

Second, there are shortcomings in the sharing and transmission of information between the supply side and demand side. Even with the introduction of environmental laws or standards, it will only translate into actual deployment of finance if investors have access to sufficient information to understand the impacts of these changes. Which industries will be affected by the rules? What are the specific characteristics and attributes of the industries and their new investment needs? What are the risks and revenue models underpinning projects?

Recognizing these challenges, the task force has developed proposals for systemic and institutional changes to build bridges between supply and demand systems.

China has a diverse financial system ranging from traditional commercial bank credit and bond finance to listed equity financing, insurance, various PPP arrangements, carbon finance, etc. Even though these different sectors hold substantial capital, given the dominance of the banking sector, the greening of the financial system can most effectively start from the banking sector and then extend to other parts.

Challenge #3: Green finance development lacks comprehensive legal foundation

Green finance reform can only be effectively implemented if a comprehensive legal foundation has been established. For instance, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in the United States establishes banks' responsibility for cleanup of polluted sites. The liability of a bank in relation to its borrowers is precisely determined in a manner that is not yet the case in China.

In the 1990's, China began to advance the legal structure for green finance. The Peoples' Bank of China (PBOC) released the *Circular on Issues Concerning Implementing Credit Policy and Enhancing Environmental Protection* in 1995, which required financial institutions at different levels to take environmental protection and pollution prevention as one of the key factors in reviewing loan applications. In 2001, the Chinese Securities Regulatory Commission (CSRC) issued the *Guidelines on Information Disclosure by Public-offering Companies*, requiring issuers to explain risks to investment projects caused by

environmental factors, including risks related to changes in environmental policies. In 2001, eight government agencies, including the SETC and the PBOC, jointly released the *Opinions on Accelerating the Development of Environmental Protection Industries*. The agencies identified the development of environmental protection industries as one of the industrial policies of China, and stated that the PBOC and commercial banks should support industries and products with high technology content, high added value, low energy consumption, and low pollution. In 2007, the State Environmental Protection Administration (SEPA), PBOC, and the Chinese Banking Regulatory Commission (CBRC) jointly released an *Opinion on Implementing Environmental Protection Policies and Regulations to Avoid Credit Risks*. The Opinion emphasized that a clean environmental compliance record should be a precondition for issuing loans to companies.

In February 2012, the CBRC released the *Green Credit Guidelines*, which defined the direction and priorities for green credit in China. The guidelines stipulated that industries which are regulated by the state or bear major environmental or social risks shall implement differential and dynamic credit granting policies to manage risk exposure. In January 2015, CBRC and the National Development and Reform Commission (NDRC) unveiled the *Energy Efficiency Credit Guidelines* to encourage and direct financial institutions in the banking industry to develop energy efficiency-related financial products and services, to effectively manage risks related to this business, to support industrial restructuring and technology upgrading, to promote energy saving and emissions reduction, and to advance green development.

These regulations give impetus to the development of green finance in China. However, despite these numerous efforts, a number of problems still exist today, such as incomplete legislation, ineffective operational structures, etc. For instance, the *Energy Efficiency Credit Guidelines* released by CBRC and NDRC focus on encouraging financial institutions to fulfill their responsibilities on environmental protection, yet they lack clear penalties and a mechanism for targeting violators. The absence of legal foundations is regarded as one of the major barriers to promoting green finance reform. Therefore, the Task Force gives policy recommendations on establishing and improving the legal foundations for green financial reform.

Challenge #4: A coordinating mechanism is urgently needed at the central level to guide the development of green finance

At present, one of the barriers to promoting green finance reform is the absence of a coordinating mechanism at the national level. The development of green financial reform requires the collaboration of numerous different departments. The Task Force has outlined a Strategic Framework (see Fig. 1-1) containing four parts. However, these four parts all pertain to the domain of different government authorities and will best serve the national strategy for green transformation if the parts are developed jointly and in coordination. For example, the demand for green finance is affected by not only the Ministry of Environmental Protection, but also the Ministry of Agriculture, the Ministry of Water Resources, the Department of Forestry, the Ministry of Industry and Information Technology and the Ministry of Commerce. As China's financial system continues to evolve and diversify, the supply of green finance is driven by the traditional "one bank and three commissions" (PBOC, CBRC, CSRC, and CIRC) as well as other agencies such as the NDRC, the Ministry of Finance, and multilateral financial institutions such as AIIB. Under the present situation, China lacks a coordinating mechanism at the level of the central government, which makes it difficult to guide the four parts of the green financial system to function in a coordinated way. Hence, the task force puts forward the policy recommendations to address this gap.

Challenge #5: Green finance reform in China lacks clear strategic route map

Green finance reform is a comprehensive process that will build a green financial and market system in stages. At present, green finance reform in China lacks a clear strategic road map. As a result, green finance reform is handicapped with inadequate coordination and operation. For this reason, the Task Force proposes a strategic road map for green finance reform and priority areas that will enable breakthroughs in the near-term.

Chapter 2: Demand for Green Finance

The supply and demand of green finance is built on the foundation of a range of policies and enabling conditions such as laws, standards, resource pricing, regulatory enforcement, and others. Government policies play an active role in shaping the market and influencing private investment decisions by individuals, households, small and medium size businesses, large corporations, and other economic actors. Policies that generate higher costs for polluting activities will naturally increase the amount of private investment in greener production and consumption. As private investment increases, there will be less need for government-led interventions to subsidize green investment.

Although the investment requirements for remediating past or existing pollution can be relatively clearly defined, the nature of future demand for green finance and investment will partially depend on government decisions on policy. In addition, some of the most significant drivers of green investment, such as urbanization, climate change, transformation of production systems, and the interaction between infrastructure sectors, have mutual influence upon each other, making long-term predictions challenging.

China currently is facing a choice between two paths for investment. China can continue to follow today's development pattern or China can pursue a "greener" development path, which will bring additional medium to long-term social and economic benefits. Thus, green investments should not be viewed solely in terms of the visible short-term investment costs. If all costs and benefits are considered, the actual cost of "greener" path may be lower over time than continuing the current development pattern. International experience demonstrates that the benefits of more efficient use of capital and the elimination of the need for the investments necessary for resource-intensive development and to clean up pollution can balance the added upfront costs of "greener" development paths. The high costs of air pollution alone suggest large benefits for China from cleaner development pathways.

1. Research Scope and Analysis

We have undertaken a quantitative analysis to illuminate current and future demand for green finance.

Drawing upon the published plans and goals of various government agencies, the project team divided demand for green finance into three main categories of investment:

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- those requiring principally private sector investment;
 - those likely have both public and private investment; and
 - those unlikely to be commercially viable.

Estimates were developed for six sectors: sustainable energy; infrastructure (including environmental protection infrastructure); environmental remediation; industrial pollution control; energy and water efficiency; and green products. These six sectors have been divided into 16 sub-sectors (see Table 2.1). A number of other important sectors exist but not be included here, such as ecosystem protection, climate adaptation, and green consumption.

We have estimated the financial demand under low, middle, and high scenarios for the period of 2014 to 2020.

- The low scenario is based on the green development goals as of 2013, the level of environmental protection as of 2013, and levels of investment at that time. However, this level of investment may not be sufficient to achieve the green development goals;
- The middle scenario is based on the investment need to achieve the environmental standards of 2013 combined with the investment needs for the green development goals as updated in 2015;
- The high scenario is based on the environmental standards set in 2015 combined with the green development goals as set in 2015.

Table 2.1 Demand for Green Finance in China (2014-2020). Unit = billion yuan.

Source	Category	Sub-category	Low	Medium	High
Private Funds	Sustainable Energy	Renewable and Clean Energy (electricity generation)	3,230	4,580	5,540
		Biomass Energy (non-electricity generation)	190	360	360
	Industrial Pollution Control	Industrial Wastewater	330	670	990
		Industrial Air Pollution	80	490	840
		Industrial Solid Waste	10	720	960
	Environmental Remediation	Industrial Land	3,200	4,200	5,200
Private Funds and Public Funds	Other Infrastructure, including for Environmental Protection	Municipal Water Supply	720	1,530	1,530
		Municipal Wastewater Treatment	170	900	1,440
		Municipal Rail Transportation	3,850	4,550	4,550
		Municipal Solid Waste Treatment	130	360	650
	Energy and Resource Efficiency	Energy Efficiency	800	1,350	1,350
		Water Efficiency	300	1,200	1,200
	Green Products	Green Buildings	530	1,320	1,320
		Electric Vehicle	220	650	650
Public Funds	Environmental Remediation	Agricultural Land	400	600	1,200
		Groundwater	400	800	2,100
Total			14,560	24,280	29,880

2. Matching Demand with Supply Tools

In addition to our quantitative analysis of financing demands, we also considered the nature of the instruments that could be used to raise and channel investment. The different types of demand for green finance need to be supported by the appropriate policies and tools.

Many of the technologies for sustainable energy are relatively mature and established and demonstrably contribute to reducing air pollution. However, they require substantial upfront investments and a long return period. Therefore, they are best suited to the use of financial instruments and policies such as loans, emissions trading, and green bonds.

Environmental remediation requires very large investments over time, and typically offers two different types of investment profiles. One type is to provide substantial public benefit or service, such as remediation of farm land and groundwater, where the costs of clean up exceed the financial returns over the life of the project. For this type of project, government funding and PPP is likely to be the most suitable financial instrument. The other type refers to industrial or commercial land that requires remediation. These types of projects typically have significant commercial return potential once the land is returned to a usable state, especially in areas with rapid economic growth or in development zones. The financing needs of this type of commercially viable projects can be met through loans and investment funds.

The financing needs for infrastructure are also quite large and such infrastructure usually provides a public service. The use of PPP can engage the private sector and the use of green bonds can tap capital markets. Private capital is most easily engaged where the use of the infrastructure service can be measured, (e.g. through user fees for services that generate revenue streams). Infrastructure that has lower use or is more difficult to price will rely more heavily on public funds.

Industrial pollution control investments should follow the principle of “polluter pays” and draw upon private investment. Enterprises may choose to draw upon a range of different forms of financing to support their investments into pollution control.

Energy and water resource efficiency rely on technology improvements and may be characterized by significant upfront investments that are recouped over time. Green bonds and loans are well-suited as financing tools for improvements. Investment funds may be well-suited for concentrating both public and private capital to support the development and

commercialization of advanced technologies or practices such as in the industrial or agriculture sectors or in buildings. Low-interest credit lines can also overcome barriers to stimulate private investment.

Green buildings and electric vehicles can be supported through green bonds and loans.

As can be seen, no single solution fits every type of demand. Needs and projects will be funded in different ways suited to their particular characteristics. In general, the government should start by using relative price changes (via subsidies or adjusting taxes) to make private investment (via bank credit and green bonds) attractive. This should be possible in sectors such as construction and in energy investments. In remediation, this is more difficult, which is why government funding may be more important in that field.

3. Long-Term Projections

Targets for environmental protection and green development up to 2020 have been defined in current national and sectoral plans. However, beyond 2020, the lack of clarity around a number of key variables, including future standards and goals, the level and quantity of investment, and future development plans and policies makes it difficult to provide reliable estimates for 2030. Estimates for the period of 2021-2030 (Table 2-2) carry a substantially higher degree of uncertainty and potential for change than the estimates for 2014-2020.

Table 2.2 Demand for Green Finance in China (2021-2030). Unit = billion yuan.

Source	Category	Sub-category	Low	Medium	High
Private Funds	Sustainable Energy	Renewable and Clean Energy (electricity generation)	7,370	9,320	12,820
		Biomass Energy (non-electricity generation)	910	940	2,640
	Industrial Pollution Control	Industrial Wastewater	370	630	1,010
		Industrial Air Pollution	120	110	160
		Industrial Solid Waste	290	780	1,340
	Environmental Remediation	Industrial Land	3,400	15,040	18,800
Private Funds and Public Funds	Other Infrastructure, including for Environmental Protection	Municipal Water Supply	880	1,870	3,970
		Municipal Wastewater Treatment	1,430	1,100	12,860
		Municipal Rail Transportation	730	1,250	7,950
		Municipal Solid Waste Treatment	670	640	650
	Energy and Resource Efficiency	Energy Efficiency	320	410	1,150
		Water Efficiency	1,800	3,100	12,400
Public Funds	Environmental Remediation	Agricultural Land	3,600	5,400	10,800
		Groundwater	4,600	7,200	8,900
Total			26,490	47,790	95,450

Chapter 3: Architecture of a Green Financial Market: Institutions, Rules and Instruments

With the emergence of the “New Normal”, China will benefit significantly by speeding the establishment of a greener finance system. In recent years, China has made substantial efforts to guide the development of Green Credit policy, including establishing a statistical system for green credit and emphasizing the importance of restricting access to credit for highly polluting and energy-intensive sectors. China has also initiated work in other arenas, including piloting carbon trading, and piloting environmental liability insurance in some localities. However, these efforts are just a first step towards establishing a green financial system. In addition, they face limits to their impact because they are disparate initiatives and not yet integrated into a systematic policy framework that is coordinated with economic development policies.

At present, China’s economic structure is undergoing massive transformation and adjustment. This is both a challenge and an opportunity for China’s green industries. China can benefit from successful international experiences, and strive to construct a more comprehensive and effective green finance system encapsulating the following five components: a) banking & credit; b) capital markets; c) insurance; d) PPP and environmental protection funds; and e) carbon markets. Given the very urgent need for green finance, such a system should leverage a range of tools to mobilize public finance and private capital and to incentivize investments to shift from “brown” to “green.”

1. The Banking System

For a considerable period of time into the future, the main source of finance for green investment will continue to be green credit. According to statistics from the China Banking Regulatory Commission (CBRC), green credit accounted for approximately 9% of the total loan balance, and approximately 6% of total bank assets at the end of 2013. Currently, annual total credit growth is approximately 10 trillion yuan per year. If ten percent of this growth (i.e., 1 trillion yuan) were to be green credit, then it would still only satisfy approximately one fourth of the annual green investment needs. The Task Force hopes that the annual growth of green credit could, on average, account for 20% of the annual credit growth over the next five years allowing the volume to reach 2 trillion yuan.

The Task Force recommends that green credit should be promoted during the Thirteenth Five-Year Program period by: a) greening the banking system through the institutionalization of environmental business within existing commercial banks; b) enhancing the role of interest subsidies in leveraging green credit; and c) clarifying the environmental liabilities of banks. These three aspects are elaborated below.

1.1 Towards establishing a green banking system

Since 2007, the government has been promoting the Green Credit policy to encourage commercial banks to invest in green industries. However, the actual implementation is such that the development of green credit has been impeded in many ways.

Commercial banks face the dual constraints of their business model and their technical capabilities. Within their business model, there exists a mismatch between the short-term nature of the funding sources used by commercial banks and the relatively long duration of green projects. The incentives provided by government policies are limited, and the penalties imposed on investments that cause pollution do not create enough risks to deter banks from lending to such projects.

In terms of “technical capabilities”, commercial banks typically lack staff who understand green technologies and are familiar with the business models underlying green projects. As such, banks have difficulty evaluating green projects and managing such loans and customers.

The Task Force recommends several specific steps to green existing banks: 1) specialized green credit departments should be set up within banks; 2) banks should be ranked based on their green performance to recognize those with a high percentage of green loans and mature environmental risk control procedures and methodologies; and 3) banks should be encouraged to establish internal green credit objectives and performance incentives; and 4) Banks should also be encouraged to conduct stress tests assessing the potential impacts of environmental standards becoming more stringent or changes to resources prices in the future.

Banks should also be encouraged to conduct quantitative analysis of the environmental costs of projects. The analysis can be used as a basis to explore and establish internal environmental cost methodologies which can be integrated into banks’ credit risk pricing systems. This would allow banks to reduce the internal cost of green loans and increase the

internal cost of loans by projects with higher environmental risk profiles. A public Project Environmental Cost and Benefit Evaluation System should be established in order to rapidly enhance the capabilities of the entire financial sector (including banks) to identify and evaluate green projects. It is useful to note that the development banks of some countries – such as KfW of Germany – have set up Green Finance Departments which focus on investing in green projects and helping with building the capacity of private banks and enterprises. It is also useful to note that the Industrial Bank in China has set up an Environmental Finance Department in order to enable specialized management of green finance. Since this department was established, the non-performing assets of the bank have been effectively controlled (with an NPL ratio of 0.2% only) and return on capital has been more than 20%.

1.2 Strengthening interest subsidies for green loans

Subsidizing interest is an effective means of using a relatively small amount of fiscal funding to leverage private capital at a ratio of more than ten times. In recent years, China has been strengthening support for energy conservation and environmental protection, and has promulgated dozens of policies to increase fiscal expenditure for that purpose. However, most of the support takes the form of direct subsidy, whereas interest subsidies are relatively less common. At the national level, most of the funding from the central government's earmarked budget for environmental protection is used as direct grant, subsidy or award, but not typically for subsidizing loan interest. Some local governments have identified loan interest subsidies as a way of spending earmarked funds for environmental protection, and some local governments have even emphasized that all fiscal support to key pollution mitigation projects should in principle come in the form of loan interest subsidies. However, the number of regions where interest subsidies have actually been adopted is limited, and some local governments have even withdrawn their support for the approach.

Compared with direct subsidy, interest subsidies can enable a modest amount of funding to achieve bigger social benefits, and guide more private capital to invest in environmental protection. At the same time, an interest subsidy mechanism can transfer the responsibility of project identification and selection from the government to more specialized commercial banks and other economic entities, thereby alleviating administrative and supervisory burden on government finance departments.

The German Government entrusts its national development bank – KfW – to provide loan

interest subsidies for environmental and energy conservation projects, which has produced good results. In order to ensure the effectiveness of its interest subsidy program, KFW has put in place a series of concrete measures, some of which are listed below. First, the objective of the program is to contribute to the realization of the national strategy for improving environmental quality and promoting energy efficiency. Second, in order to make sure that projects comply with stipulated standards and to reduce project risks, the bank provides expert consulting services for the parties receiving its investment. Third, for energy efficiency projects, interest subsidies can only be obtained after the investment has been made. Fourth, the bank supports bundled products for energy efficiency projects. Fifth, the bank encourages the application of innovative technologies or practices. Sixth, the bank pays close attention to the demonstration impact of public goods with a view to raising the public's environmental awareness.

Based on our analysis, there are several reasons for the lack of use of interest subsidies by special environmental protection funds. First, the finance authorities of the government do not fully recognize the lever effect of interest subsidies in mobilizing private capital. As a consequence, the amount of fiscal resources allocated for interest subsidization is very limited. Second, financial authorities have limited staff and technical capabilities for evaluating projects. This prevents them from expanding the use of interest subsidies. Third, the application documentation requirements are overly-stringent. For example, for projects that contain pollution treatment facilities, the policy is that interest subsidies apply to loans obtained for purpose of constructing the pollution treatment facilities only, and not to loans obtained for the purpose of constructing the main manufacturing facilities. In practice, it is difficult to distinguish between these two “types” of loans, making it impossible for project owners to present verification documents from banks. Fourth, restrictions on the rate and duration of subsidies are overly stringent. Fifth, subsidies typically apply to the interest payment within a certain duration. The amount of funding involved is usually small, and the application time frame is relatively tight. This increases the relative cost of preparing the required documentation. As a result, only a small proportion of projects have applied for subsidies.

The Task Force proposes the following specific recommendations to establish a highly effective interest subsidy mechanism. First, the use of interest subsidies should be promoted in fiscal spending on energy conservation and environmental protection, and the scale of funding for interest subsidies should be expanded. Second, the subsidization rate should be increased. Currently, the subsidization rate typically cannot be higher than the PBOC's

benchmark interest rate or banks' loan interest rate; in some cases, the upper limit is set to be the actual interest rate of the same year, and cannot be higher than 3%. It is recommended that green loans enjoy full interest subsidization based on the actual interest rate. Third, the subsidy duration should be set differently. Currently, the duration of interest subsidization through central fiscal funding is typically no more than three years and even less under some circumstances. This has seriously constrained the use of this instrument. It is recommended that the "three-year maximum duration" requirement be lifted based on the actual characteristics of green loans. Fourth, by drawing on the experience of KfW in Germany, China could pilot the practice of entrusting commercial banks to manage interest subsidies programs for green loans.

1.3 Environmental liabilities of banks

China's current legislation on environmental protection and financial services falls short of stipulating the environmental legal liabilities of commercial banks. In order to pursue a high return on capital or due to pressure from local governments, some commercial banks have invested in highly polluting industries (such as iron & steel, cement and chemicals), which are contributors to environmental damage. Therefore, commercial banks should be held partially accountable for environmental degradation, and the law should clearly define the legal liabilities of commercial banks for the environmental consequences of their investments.

In developed countries in North America and Europe, commercial banks may face prosecution if they invest in polluting projects and have caused environmental damage as a result. In recent years, some developing countries, such as South Africa and Brazil, have introduced legislation on the environmental liabilities of commercial banks. Such legal stipulations serve as a strong influence on the lending behaviors of commercial banks and motivate them to incorporate due diligence on the environmental consequences and associated risks of prospective deals.

As commercial entities, banks are geared to pursue profits and control risks. In addition, they should also ideally seek to allocate resources towards the projects that have minimal environmental risks or actually demonstrate outstanding environmental performance. If commercial banks are regulated in such a way that they are obliged to consider the potential environmental impacts of their transactions, it would be possible to guide the flow of financial resources into projects that comply with the principle of sustainable development. If this were to be achieved, commercial banks could become key players in the pursuit of

sustainable development.

We have the following specific recommendations regarding clarifying the environmental liabilities of banks. First, *Commercial Banking Law* should be revised to clearly stipulate the legal obligation of commercial banks to evaluate and monitor the environmental impacts of the projects in which they invest. The environmental legal liabilities of a commercial bank should be defined in such terms as liability attribution, form of liability, extent of liability, etc. Environmental law enforcement authorities, NGOs and individuals should be granted the right to sue commercial banks. Second, based on the revised *Commercial Banking Law*, the CBRC, the PBOC and environmental authorities should formulate specific rules to: a) clarify the requirements and specific procedures required for due diligence and risk management by commercial banks on environmental risks; b) define conditions for waiving liability; and c) clarify the upper limit of joint legal liabilities that commercial banks shall bear in circumstances where they fail to undertake due diligence.

2. Capital Markets

Capital markets are comprised of equity markets and debt markets. This section addresses both aspects of the financial system.

2.1 Green stock markets

2.1.1 Current status of China's green stock market

China's green equity market has developed along three lines to date. First, listed companies are required to disclose information about environmental risks and sustainable development, which helps promote the environmental awareness of these companies and their investors. Second, green securities indices have been launched to offer the market opportunities for investment. Third, some green investment funds have been developed to meet the capital demand from environmental protection and energy conservation industries.

2.1.2 International experience

In 2002, Johannesburg Stock Exchange in South Africa started to require all listed companies to publish sustainability reports. The *King III Code of Corporate Governance* launched in 2009 states that a company's annual financial report should include environmental and social information, which should be reviewed by an independent auditor. In order to promote the

long-term competitiveness of the companies within its jurisdiction, the European Union issued *Directive 2013/34/EU* and *Directive 2014/95/EU* requiring that companies above a certain size should disclose environment, social responsibility and governance information in their annual reporting.

Internationally, dozens of sustainability indexes have been launched such as the Dow Jones Sustainability Index, FTSE Good World Social Index, MSCI ESG Index, etc. Among them, Dow Jones Sustainability Index has the longest history and has widespread influence. In addition, there are specialized indexes in clean energy and clean technologies, such as the WilderHill Clean Energy Index (ECO), CTIUS, the NASDAQ Clean Edge Green Energy Index, and the S&P Global Clean Energy Index.

2.1.3 Policy recommendations on improving China's green stock market

First, green securities should be incorporated into China's *Securities Law* and *Corporate Law*, and the environmental information disclosure (EID) system for listed companies should be improved. Specifically, the *Securities Law* and the *Corporate Law* should include a requirement for listed companies and bond issuing companies to disclose environmental information to lay a foundation for green securities. Strengthening the EID system will be important for: a) pushing companies to fulfill their social responsibilities; b) protecting the interest of investors in the securities market; and c) preventing environmental risks. The China Securities Regulatory Commission (CSRC) should further strengthen EID requirements and the verification responsibilities of intermediary institutions.

Second, cooperation in the enforcement of EID disclosure requirements should be strengthened. The securities regulatory bodies, self-regulated organizations, and environmental authorities should strengthen the exchange of environmental information disclosed by companies. Oversight regarding the quality of EID by listed companies or debt issuing companies should be further strengthened, including the materiality, timeliness, reliability, and comparability of EID. Existing supervisory and administrative means and measures should be fully utilized to identify and penalize violations of EID regulations, so as to ensure EID by listed companies and bond issuing companies is sufficiently open and transparent.

Third, green investment should be systematically encouraged, so as to motivate influential institutional investors to introduce environmental criteria into their investment decision

making. Increased investor attention to environmental disclosures will motivate investee companies to improve their performance and their information disclosure. Initiatives should also be launched to educate investors on green securities and the use of environmental information.

Fourth, an environmental performance evaluation (EPE) system should be established for listed companies. Research needs to be carried out on an EPE indicator system for listed companies by drawing on international experience. A cross-section of energy-intensive and/or heavily polluting industries could be selected to pilot EPE.

Fifth, a fast track should be established for the IPOs of green enterprises. Stock exchanges should increase their support for the direct financing of green enterprises. The quality and efficiency of verification services for securities offerings should be enhanced, so as to gradually shorten the waiting period for green enterprises.

Two specific recommendations are as follows: First, the IPO verification and filing procedures for green enterprises should be simplified, and restrictions regarding the amount and ratio of fund raising - for the purpose of replenishing liquid capital or repaying bank loans – should be relaxed as appropriate. Specific definitions could be developed for “green enterprises” to determine eligibility for the fast track. Specific policies could be developed by drawing on China’s past experience in creating fast track mechanisms. For example, enterprises from the affected regions of the Great Wenchuan Earthquake were provided with a fast track and a similar process was also established for enterprises from western regions such as Tibet and Xinjiang after 2012. Green enterprises should have priority during the IPO verification process, and their IPOs should be distributed in a balanced way between the Shanghai Stock Exchange and the Shenzhen Stock Exchange.

Second, given the ongoing suspension of IPO approval, it is difficult for green enterprises to raise funds in the near term through an IPO on the main board. It is therefore recommended that the National Equities Exchange and Quotations (NEEQ) adopt measures to encourage green enterprises to seek listings. In the future, if “board transfer” is piloted for enterprises listed on the NEEQ, appropriate preferential policies could be considered for green enterprises.

2.2 Green bond market

2.2.1 The importance of a green bond market to China

In 2014, bond financing accounted for nearly 20% of total investment. This ratio is expected to reach 30% in the future. However, so far, green investment almost entirely relies on green loans. Assuming that the ratio between bond financing and total investment applies in equal proportion to the green financing market in the future, then the green bond market could grow to provide 20-30% of China's total green investment. The bond market would then become the second largest channel for green financing. Green bond financing is particularly suitable for medium and long-term green projects with stable cash flow (such as railway, light rail, renewable energy power generation, urban wastewater treatment, and green buildings, etc.), and such projects are expected to account for more than 30% of all green projects. Therefore, a more developed green bond market will significantly boost China's capacity for green investing.

The green bond market has special significance in two ways. First, it will enhance the capacity of banks to provide medium and long-term green financing. A great many energy conservation and environmental protection projects need medium and long-term financing. However, most of the liabilities of China's commercial banks are short-term, which constrains the banks' ability to be proactive and take risks in providing financing for medium and long-term projects. Bonds could become a source of long-term, stable funding for medium and long-term projects. This will effectively solve the problem of the mismatch of the durations between banks' assets and their liabilities.

Second, it will make financing less difficult and less costly for green enterprises. Bond issuance reduces intermediary costs for banks, so the financing cost is lower than the cost of loans. Since it is difficult for green enterprises to obtain long-term loans from banks, they typically have to borrow new loans in order to repay old loans on a continual basis. This increases the risk of capital chain rupture. An enterprise can avoid such risks by directly issuing a long-term green bond. In addition, some enterprises might not qualify as issuing body because their financial position does not meet the requirements of the market. However, they might have certain projects that have sufficient cash flow to seek financing on the bond market in the form of "green project financing bills."

2.2.2 International experience with green bonds

International standards regarding the requirements of a green bond emphasize three aspects. First, there is very strict requirement that money is invested in green projects. Second, the issuing enterprise should have very clear procedures to supervise the flow of funding. Third,

the issuing enterprise needs to prepare regular reports for investors on the flow of funding.

Ever since the World Bank put forward its first Green Bond in 2007-2008 and the European Investment Bank put forward the Climate Awareness Bond, the green bond market has been developing rapidly. In 2014, the total green bond issuance exceeded 35 billion dollars, which was more than triple the amounts from 2013. Although the green bond market size is still very small, accounting for only less than 1% of the US bond market, it is predicted by the Climate Bond Initiative (CBI) that green bond issuance will reach 100 billion dollars in 2015.² As of June 2014, among the green bonds issued by the World Bank, 25% were for sustainable transportation, 23% for energy efficiency, 19% for renewable energy, 11% for water treatment, and 22% for other sectors.

At the beginning, green bond issuance was mainly dominated by multilateral development banks. Starting from 2014, new forms and new issuers have appeared. Enterprises, provincial-level (state) governments and issuers from emerging markets have begun issuing green bonds. In 2013, the market share of corporate green bonds was very small. However, in 2014, corporate green bonds became a main driver of market growth and accounted for more than 30% of total market issuance. The share of municipal green bonds in the market has increased to 13% following the issuance by Ontario, Canada and eleven states in the US in the second half of 2014. Issuers from emerging markets are also starting to enter into the green bond market. In 2014, the first green bond issuer from emerging markets launched in Johannesburg, South Africa that was followed by the Yes Bank announcing the first issuance of a green bond in India.

Due to a relatively small probability of green bonds becoming non-performing assets, large asset management firms are very active in the market. Large asset managers have become the biggest holders of green bonds issued by the World Bank. In the future, insurance companies are likely to become the biggest holders of green project bonds.

2.2.3. Recommendations on developing a green bond market in China

First, regulators should provide guidance on green bonds to support market development. The

² Statistics from Securities Information and Financial Market Association (SIFMA) shows that, in 2014, the total amount of bonds issued was 5.8 trillion dollars.

PBOC could take the lead in providing guidance on green financial bonds issued by banks for inter-bank investors and green corporate credit bonds issued by non-bank institutions. On that basis, the CSRC could provide guidance on green bonds for Exchange investors, and the NDRC could subsequently provide a supporting statement and guidance regarding green bonds by SOEs. Such guidance by the regulatory bodies should focus on clarifying the following aspects regarding green bonds: a) basic principles for green bonds; b) review and approval procedures; c) regulatory responsibilities; d) reporting on the use of funds; e) overall disclosure requirements; and f) performance evaluation expectations. The guidance should also provide policies to support green bonds, such as: a) simplifying review and approval procedures; b) allowing adequate flexibility for the use of funds; c) allowing financial innovation; and d) opening the market to international investors.

Second, green bonds should be defined and classified. In order to establish authoritative standards, the work could be guided by the Professional Committee on Green Finance under China Society for Finance and Banking.

Third, the income from the interest of green bonds purchased by enterprises and institutional investors should be fully exempt from corporate income tax.

Fourth, interest subsidies and policies to enhance creditworthiness can be used to support green bonds. Local governments should be encouraged to allocate dedicated budgets to subsidize - partially or fully - the interest of loans borrowed by enterprises for the green projects supported by green bonds. Local governments should also adopt measures to enhance the credit profiles (such as guarantee measures) of green projects supported by green bonds. Such measures have been used successfully in the past to support SME and S&T enterprises.

Fifth, a monitoring and evaluation system should be established. Third-party evaluation institutions with technical capabilities should be cultivated to: a) certify green bonds before their issuance; and b) evaluate the use of funds and the benefits of green bonds after their issuance. The capabilities of bond rating institutions, institutional investors, and analysts from securities firms to analyze and evaluate green bonds should be enhanced.

3. The Insurance Market

3.1 Need for and feasibility of compulsory environmental liability insurance (CELI)

In recent years, China has seen a dramatically increasing number of environmental pollution incidents. They not only pose enormous threat to property and public health, but also affect social stability. Moreover, the enterprises that cause such accidents or incidents may become bankrupt or have to shut down for failing to compensate for the damages that they have caused.

Based on an analysis of nearly 700 environmental pollution accidents in China between 1952 and 2010, we discover the following characteristics: 1) the number of accidents has been increasing, albeit with fluctuations. 2) Accidents occurred most often in the following industries: chemical materials and chemicals production, road and water transport, metallurgy, mining, and petroleum & natural gas extraction. Among them, the chemical materials and chemicals production industry accounted for 66% of all accidents. 3) Accidents occurred most often in economically advanced regions. The five provinces that had the greatest number of accidents were: Jiangsu, Shandong, Guangdong, Hunan and Liaoning. Four out of these five provinces are ranked in the top ten across the nation in terms of GDP.

This suggests a positive correlation between the frequency of environmental pollution accidents in China and the level of economic development. The industries with high frequencies of pollution accidents are important pillars of Chinese economy. In order to achieve the objectives of controlling pollution accidents while still supporting high-risk industries, it is recommended that CELI be introduced. CELI is an effective economic instrument to alleviate environmental risks and help economic entities and high-risk industries avoid causing environmental damage. Its basic function is to provide “relief” to affected parties and the high-risk enterprises. If implemented properly, CELI should help enterprises prevent and manage environmental risks, which will also enable the economy to grow steadily with less risk of disruption due to environmental incidents.

Chinese laws and regulations regarding environmental liabilities are becoming increasingly stringent, and enterprises’ awareness of environmental risks is growing. The regions with the highest levels of environmental risks are economically advanced, and the enterprises in these regions have relatively strong financial capacity. These factors provide a solid basis for the implementation of CELI.

3.2 Problems identified during the piloting of CELI in China

In 2007, the State Environmental Protection Administration (predecessor of MEP) and China

Insurance Regulatory Commission (CIRC) jointly issued *Guiding Comments on Environmental Pollution Liability Insurance* to promote the piloting of environmental liability insurance. Twelve provinces (including Hebei) participated in the piloting. The participating enterprises or industries mainly included: a) enterprises involved in the production, sale, storage, transportation and use of hazardous chemicals; b) the petrochemical industry; and c) the hazardous waste disposal industry. However, only a small number of enterprises participated in the pilot. On 21st January 2013, the MEP and the CIRC launched a new round of piloting by jointly promulgated *Guiding Comments on the Piloting of Compulsory Environmental Liability Insurance*. The types of enterprises included in the piloting were: a) enterprises related to heavy metals; b) enterprises that are required to join due to local regulations; c) enterprises with high environmental risks, such as those in the petroleum and natural gas extraction industry, the petro-chemical industry and the chemical engineering industry; d) enterprises engaged in the production, storage, use, sale or transportation of hazardous chemicals; e) enterprises engaged in the generation, collection, storage, transportation, utilization or disposal of hazardous wastes; and f) enterprises emitting dioxin. However, the post-2013 piloting program has also not succeeded in securing strong participation from neither insurance companies nor enterprises. The main reasons are as follows:

First, the existing laws and regulations lack clear statements regarding compensation liabilities for damage caused by environmental pollution. “Polluters pay” is a theoretical principle only. In practice, there is a lack of a legal basis to pursue the civil or criminal liabilities of those who cause environmental pollution accidents. The responsible parties are supposed to be punished by administrative means, but the scope of administrative punishment as authorized by the law is limited.

Second, there is a lack of legal basis for CELI. As mentioned earlier, MEP and CIRC jointly promulgated *Guiding Comments on the Piloting of Compulsory Environmental Liability Insurance* in 2013, but it is only a guidance document and not a legal basis to require enterprises to be insured. *The Environmental Law of the People’s Republic of China* (revised in 2014 and taking effect on 1st January 2015) contains an article that says “the state encourages environmental pollution liability insurance”; however, “encourage” is different from “require.”

Third, due to a lack of participation by enterprises in the piloting, the insurance companies did not have a sufficient amount of insurance requests. This made it difficult for insurance

companies to estimate the probability of accidents. Therefore, insurance companies were concerned that they might misjudge the level of risk transferred from the polluting enterprises to them. Consequently, they are unwilling to provide insurance, and even if they do in some cases, they tightly restrict the scope of insurance.

3.3 International experience on CELI

A study of the evolution and models of environmental liability insurance in developed countries shows that all countries adopted a step-by-step approach to introducing CELI. These countries exhibited the following two common features in promoting environmental liability insurance.

First, many countries have shown the tendency to promote CELI in order to alleviate polluters' burden regarding economic compensation, fully protect the legal rights of the victims and safeguard social fairness and justice. For example, the United States requires certain enterprises under specific circumstances to seek insurance and has linked environmental liability insurance with financial guarantees.

Second, the insuring institutions have a tendency to provide joint insurance. Insurance companies actively explore a "joint approach" in which multiple insurers form an "environmental liability insurance consortium" to jointly shoulder risks. In 1990, a joint insurance group consisting of 76 insurance companies was established in Italy. In France, some foreign insurance companies and some domestic insurance companies formed a "pollution reinsurance joint group". In Finland, a number of insurance companies jointly established a consortium called the Environmental Insurance Center.

3.4 Recommended policies and pathways for implementing CELI

First, legislation could be piloted initially at the sub-provincial level, and then scaled up to the provincial level or even the entire country. A number of sub-provincial-level regions or municipalities could be selected in provinces such as Jiangsu, Shandong, Guangdong, Hunan, and Liaoning where environmental risks are high. Based on the lessons learned, CELI can then be scaled up to the provincial level or even the national level.

Second, lists should be compiled to define who will be required to participate in CELI. The main role of the government should be to implement a thorough investigation regarding the need for and feasibility of such lists. Environmental risks that can be handled by the market

itself should not be included in the CELI catalogues.

Third, CELI is a type of policy-directed insurance, therefore fiscal subsidy policies or preferential tax policies should be developed in order to promote the healthy development of CELI.

Fourth, a national-level environmental liability insurance institution or information sharing platform should be established. Currently, the amount of environmental liability insurance provided by a single insurer is very small, making it difficult to model the probability of an environmental accident and the appropriate premium levels. China could consider: a) establishing a specialized national environmental insurance corporation; or b) establishing a national-level joint environmental liability insurance group by drawing on international experience.

4. Project Financing through Public-Private-Partnership (PPP)

4.1 PPP and project financing

The concept of PPP was first proposed by the Chancellor of Exchequer of Great Britain in 1992 as a solution for upgrading the UK's infrastructure and resolving the shortage of public funding, the lack of effectiveness of public institutions, and the low efficiency of public spending. The Chinese version of "PPP Model" was first put forward in a draft the government budget approved by the 2nd session of the 12th National People's Congress in March 2014. The government and private investors form a cooperative relationship across the "entire process" of delivering public goods or services. The model is based on the granting concessions, sharing benefits, and sharing risks. It aims to enhance the quality of public goods and services as well as the efficiency with which they are delivered. PPP accomplishes these goals by introducing market competition, incentive and constraint mechanisms, and taking advantage of the respective strengths of the government and the private sector.

China's PPP model relies on project finance under which a project obtains non-recourse or limited-recourse funding or loans by using the project's assets, expected income, or equity as collateral. During project financing, the main guarantee of loan repayment is tied to the financial strength of the project itself. It is a highly technical way of financing, and is mainly used for large-scale projects (such as natural gas, coal, petroleum, transportation, electricity and public utilities, etc.) which require enormous amounts of funding, carry high levels of

investment risk, have difficulty obtaining finance through traditional methods, and are expected to have stable cash flow once the project is successfully started. The key features of PPP include: a) forming a project company for the project; b) using the expected income from the project to repay debts; and c) the lending banks have limited or no recourse.

The PPP model used by the Chinese Government is a deepening of the practice of promoting the role of private parties in the provision of public services and is based on projects. For example, the PPP Project Pool established by the NDRC covers many areas such as water conservation facilities, transportation facilities, municipal facilities, public services, etc. In all these areas, there is a serious shortfall in public services. All these projects are large-scale, and a Special Purpose Vehicle (SPV) must be set up for each project. The government and private investors jointly fund the SPV so that they manage the project together via this company. However, in some cases, the government does not have to join the SPV.

Regardless of whether the government is a part of the SPV or not, it is a requirement that a PPP project must have an SPV and that any concessions and fiscal funding will be awarded to the SPV. As a result, PPPs in China must utilize project financing as a funding vehicle. As an entirely new project company, a SPV will not have three years of sufficiently strong financial statements, nor will it have sufficient collateral to secure other types of financing. Moreover, an SPV's own funding may be no more than 30% of the project investment. Therefore, the remaining funding needed by the project must be obtained by using the project's assets, expected future income, and equities as collateral.

There are five reasons why adopting PPP to promote the role of private parties in providing public services at a large scale is suited to China's current needs. First, fiscal resources are limited. Private parties can bring additional capital into public service projects, which will help make up for the shortage of fiscal resources. Some of the public service projects that formerly lacked funding have now been implemented through PPP. Second, risks will be shared by between the government and private parties and a strategic alliance reduces investment risks for each. Third, participation by private parties can enhance project management efficiency and funding utilization rate, shorten project construction duration, and reduce project costs. Fourth, competition among the private parties participating in the project will contribute to the reduction of project costs and improve investment efficiency. Fifth, the government retains a certain level of decision-making power and control over the project, which is conducive to achieving the public service objectives.

However, the shortcomings of project financing through PPP should also be noted: 1) The cost of financing is high. 2) The duration of financing/investment is long – typically 20-30 years. 3) Contract documents are numerous and complex. 4) Negotiation is time-consuming, and the front-end cost is high. Given these shortcomings, project financing through PPP is usually suitable for large-scale public service projects. If medium or small-scale public service projects need to adopt this approach, special design may be needed to bundle multiple such projects into a large one.

4.2 Applying the PPP model to environmental projects

4.2.1 PPP model for individual environmental projects

The PPP model for individual environmental projects came into being as private parties were allowed to undertake infrastructure projects. The earliest projects of this type were urban wastewater treatment plants (WWTP). They were typically large projects requiring investments at the level of hundreds of million yuan or even several billion yuan.

In 2002, the Ministry of Construction (i.e. predecessor of Ministry of Housing and Urban and Rural Development) promulgated *Comments on Accelerating the Privatization of Municipal Utilities*, which instituted concessions-based operations of municipal utilities. After that, the Ministry of Construction promulgated: a) *Administrative Rules Regarding Concessions-based Operation of Municipal Utilities*; b) *Comments on Promoting the Supervision and Administration of Municipal Utilities*; and c) *Template for Concessions Contracts*, which made specific arrangements regarding concessions and laid a basis for the application of PPP in this field.

Currently, environmental infrastructure projects (such as WWTP and power generation by waste incineration) typically adopt the PPP project financing approach. With increased financial support from both the central government and local governments at various levels, and with the introduction of the PPP project financing approach, urban environmental infrastructure construction has been greatly increased. The number of urban WWTPs increased from 537 in 2002 to 3,340 in 2013, and wastewater treatment rate increased from 40.0% in 2002 to 87.3% in 2013. Garbage treatment rate increased from 54.2% in 2002 to 84.8% in 2013. In large and medium-sized cities, all wastewater and garbage are treated.

4.2.2 PPP model for regional environmental programs

The “PPP model for regional environmental program” is an innovative form of PPP. It takes the treatment of an entire river basin or eco-city as one large program and, on that basis, constructs a PPP agreement. It is different from the “PPP model for single projects” discussed above in that it deals with a package of projects. Within the package, projects are classified as “low-return projects”, “medium-return projects,” or “high-return projects” based on expected levels of return on investment. The projects are from many industries that are inter-linked or complementary with one another within the project region. Low and medium-return projects can be bundled together with high-return projects, so that the industrial chain is consolidated to reduce investment risks and to increase the overall return of project bundles. One such example is the PPP model for the treatment of the Botanical Garden Section (Nakao River) in the upper reaches of Zhupai River, Nanning Municipality. This program, which has a total investment of 1 billion yuan, contains a number of projects - including water course treatment, water course sewage interception, water course ecology, wastewater treatment, and IT monitoring, etc. In terms of investment, this is a relatively small program for the comprehensive management of a river basin. A similar yet bigger PPP program is the comprehensive treatment of Zhupi River Basin whose planned investment in the first phase alone is 3 billion yuan. Another example is the PPP program for the comprehensive treatment of the water environment of Boyang Lake catchment, whose total investment is 12.5 billion yuan.

The advantage of using the PPP model for a regional environmental program is that the various projects from different industries can be designed in such a way that they are linked. This creates a compelling driver for all-round innovation in terms of technology collaboration, business models, and building financing platforms, thereby greatly reducing the cost of environmental treatment. However, the investment required for such a program is usually extremely large, and the duration of implementation is very long (typically 20-30 years). Therefore, a program financing platform is essential for raising funds from various channels and to reduce financial costs.

Typically, for such a regional environmental PPP program, a Program Fund should be established. The Fund should have the same characteristics as a generic PPP model: a) it is based on a program and is centered on contracts; b) it attracts investment by way of granting concessions; and c) it integrates the processes of financing, construction and operation. The assets and expected future income of the program serve as the basis for financing the Fund. The Fund regards the environmental protection activities of an entire region or river basin as a large program, which contains various sub-level environmental projects including some

medium and low-return ones. Key attributes of the Program include: a) the injection of fiscal funding; b) the granting of concessions and related contracts management; and c) overall design to make sub-level projects form industrial chains. Through these attributes, the overall return of the entire program can be increased to a level that is sufficient to attract private capital and achieve the intended environmental objectives.

Certain special mechanisms could be adopted to increase the attractiveness of a Fund to private capital. For example, insurance companies are risk-averse and typically do not invest directly in projects. However, if the Fund could adopt a Limited Partnership structure, then insurance companies could become Priority Partners. Under such an arrangement, the insurance companies would have priority for capital recovery and benefit distribution, but will receive fewer or even no excess earnings. This will reduce investment risks for insurance companies. An opposite example is private equity funds that are willing to take higher risk for higher return. They can become a separate class of partners who will be entitled to participating in the distribution of the remaining earnings after the Priority Partners have claimed their principal and shares of profits.

In sum, a Fund could be designed to accommodate the varying risk appetites and return expectations of different types of investors. Such mechanisms will help attract financial resources from a diverse set of channels, including banks credit, insurance funds, private equity funds, bonds and even pension funds. This will not only absorb private capital to the greatest extent possible, but also effectively reduce financing cost.

4.3 Policy recommendations on promoting PPP for environmental projects

First, there should be a mechanism to make sure that the required government payments and operation subsidies for environmental PPP projects are incorporated into the fiscal budgets of the government. For general environmental PPP projects, the required government payments and operation subsidies should be incorporated into the annual fiscal budgets of the relevant public agencies, and proper arrangements should be made to make sure that they are classified and delivered. For key environmental PPP projects, a longer-term budget guarantee system should be established. Namely, the required government payments and operation subsidies should be incorporated into the mid-term fiscal planning of the jurisdiction in question, so that they will be considered at a higher level. On that basis, a multi-year budget balancing and dynamic adjustment mechanism should be established.

Second, it is recommended that, for “regional environmental PPP programs,” the government participate in the SPV as a shareholder by investing. A regional environmental PPP program involves the transfer of management rights from the government to the SPV. The government can only continue to exercise control over these rights if it participates in the SPV. Otherwise, there is a greater risk of the SPV over-emphasizing investment returns at the expense of the PPPs environmental protection and public service objectives. Moreover, regional environmental PPP programs represent an innovative form of the PPP model, and the relevant rules – in terms of financing, construction and operation – need continuous improvement. A regional environmental PPP program is a package of many sub-level projects.

However, the pricing or fee collection mechanisms for the services delivered by some of these projects are not yet fully in effect. As a result, a regional environmental PPP program may not have cash flows that are as clear as those of an ordinary PPP project. If the government invested into the SPV as a shareholder, it will not only increase the SPV’s own funding and the program’s credit rating, but will also be conducive to the program’s obtaining bank loans, issuing bonds, and organizing a Program Fund (as discussed earlier and will be discussed again below).

Third, regional Environmental PPP Program Fund structures should be introduced and supported. Only with the existence of such a Fund structure (serving as a financing platform) can investors be grouped according to their different risk preferences. This will help maximize the use of available funding, optimize portfolios, and reduce financing costs.

Fourth, an innovative green financing system based on Environmental PPP Program Funds could be established. In order to promote the development of project financing, international experience could be drawn upon to establish new types of standards for: a) the assessment of loan and investment risks based on expected earnings from projects; and b) risk assessment and credit evaluation and approval for innovative projects. Moreover, innovation in environmental financial services should be encouraged. Support should be given to revenue pledge financing based on the revenues from pollution discharge rights, fees collection, government purchase agreement, and concessions contracts. In particular, revenue pledge financing should be explored for wastewater treatment projects.

Fifth, pricing and fee collection mechanisms for public environmental services should be

improved. Private parties will only be willing to enter into projects related to environmental services if there is a reasonable rate of return. The basis for guaranteeing the return of these projects is to establish effective pricing and fee collection mechanisms for public environmental services. For example, the willingness of private parties to participate in integrated river basin treatment depends on whether there are appropriate pricing and fee collection mechanisms for environmental resources, natural capital, and economic resources.

5. National Green Development Fund

5.1 Green investment funds as a source of finance

As part of supporting the implementation of China's ecological civilization goals, the 13th Five Year Plan highlights the importance of green finance and calls for the establishment of a Green Development Fund. China's green industries face a number of bottlenecks to their development that can be addressed through green finance reform. Green industries will need increase in size and scale as well as undergo consolidation in order to become capable of innovating new technologies and competing internationally. However, interest subsidies and other public subsidies cannot deliver the level of finance needed to support such an upgrading of the sector. Bank loans have been the primary source of green financing in China, but not all companies can access bank financing. Therefore, a fund is needed that can leverage private capital to make equity investments to enable the transformation of green industries.

5.2 The benefits of establishing a market-oriented green fund

A Green Development Fund should be established on a market-oriented, commercial basis for several reasons. First, an equity-focused fund can fill gaps in the marketplace that cannot be readily addressed through interest subsidies or other financing instruments. Many companies in green industry sectors lack a deep capital base, which impairs their ability to scale their business and innovate new technologies. This is particularly a problem for early stage companies, SMES, and companies that operate in asset-heavy industries. Weak capitalization also creates a barrier to accessing bank financing since projects and companies can only obtain bank financing once they have reached a certain level of financial stability and capitalization. Government subsidy programs can provide support that enables companies to remain solvent in the marketplace, but they can't provide the capital necessary to grow or enhance competitiveness. As a result, green industries run the risk of becoming a burden on public finances and surviving at the margins of the market through continued subsidies rather

than becoming new drivers of economic growth. An equity-oriented development fund could provide capital to enable companies, to make the leap in scale necessary for sustained growth.

Second, a market-oriented green development fund could efficiently pool capital from public and private investors with differing risk appetites. A fund would also have flexibility to launch sectoral or regional funds on a limited partnership basis to optimize the deployment of its capital. This would allow for the use of differentiated return mechanisms that can optimize its ability to attract private capital.

A green development fund could potentially deliver a higher degree of effectiveness than public grants. Green investment projects are highly specialized and technical in nature. Establishing standards that span the full spectrum of green industries to guide reviews of subsidy applications and fairly disburse public funds is complex. The process requires staff with specialized skills in finance and environment, which can be difficult to source and retain in a public sector organization. A commercially-oriented green development fund would apply market discipline and standards to select investments, yet, as a publicly-sponsored entity, it could also take public benefits into account. This balancing of public interest with market discipline can result in increased administrative efficiency and improved decision-making. In addition, a Fund provides a more efficient means of using limited government resources than direct grants due to its ability to leverage private capital. Operating independently of annual budgeting cycles also eliminates uncertainties for investee companies who otherwise might be concerned that unforeseen budget changes might disrupt their investment plans.

5.3 Recommendations

5.3.1 Parameters for a Green Development Fund

The Task Force recommends the establishment of a National Green Investment Fund to support the development of green industries. The fund should operate on a commercial basis with professional management applying a market-oriented approach to medium-to-long term investments into large-scale projects. It should primarily make equity investments, but should also be given the flexibility to make debt investments, offer mezzanine financing, and provide guarantees. Investment priorities should include sectors that can support a green and low carbon economy such as: resource efficiency, renewable energy, industrial pollution control, and advanced vehicle technologies. The purpose of the Fund should not be profit

maximization, but rather to provide public benefits while still remaining commercially sustainable. In order to maximize its ability to efficiently leverage private capital, the Fund would have the option of establishing sectoral funds or regionally-focused funds that could be structured as joint investments with domestic and foreign partners. At the project level, the Fund could utilize debt instruments (e.g., bank loans, issuance of bonds) to increase the capital available.

The Fund should be designed with strong governance mechanisms to ensure that it maintains efficient operations focused on clear investment goals. The fund should establish performance targets, including both financial and environmental criteria. The Fund management evaluation and compensation criteria should be clearly defined, and regular audits conducted by independent third parties. Annual reporting, would highlight the commercial basis for the Fund, and strengthen the Fund's ability to attract different types of investors.

5.3.2 The scale and capitalization of the fund

In light of the estimates presented in Chapter 2, the Task Force recommends to initially set the target for capitalization of the Green Investment Fund to reach 300 billion RMB over time with the option of raising further private capital as needed. The primary sources of the capital for the fund could include: fiscal funds from the central government, development finance, and other interested financial institutions and private investors.

6. The Carbon Market

6.1 Current status of China's carbon market

China has been piloting carbon emission rights trading in seven locations (including Beijing, Tianjin, Shanghai, Chongqing, Hubei, Guangdong, and Shenzhen). The pilot phase covers the three years of 2013-2015, during which the seven pilot provinces/municipalities successively kicked off carbon trading. In 2013, China's carbon market became the second largest in the world following the European Union Emissions Trading System.

According to the plans of the NDRC, the period of 2014-2016 is the Preparatory Phase for establishing a national carbon market. During this phase, the design and construction of the market will be completed, relevant laws and regulations developed, the human resources lined up, work mechanisms further improved, and fundamental capabilities put in place. The

years of 2017-2020 will be the phase for launching and continually improving the market. During this phase, the market's development will be monitored, rules will be refined, and the market is expected to develop steadily. The years beyond 2020 will be the Stabilizing and Deepening Phase during which market coverage will be expanded, the types of traded products will be increased, and international links will be explored.

From a long-term perspective, the objective of a national carbon market is to transform China's scattered and experimental regional markets into a single compulsory national market. The integration process will move in stages and will unify the following aspects: a) registration and filing platform; b) monitoring, reporting and verification (MRV) rules; c) rules relating to the distribution of allowances; d) convention implementation rules; e) qualification requirements; and f) supervision and administration.

6.2 Existing problems with China's carbon trading

Many shortcomings have been observed in China's current carbon market. In all the pilot markets, liquidity is low, trading volume is small, and traded carbon prices have been trending downward. These shortcomings indicate that a problem exists in linking the allowances generation mechanism to GDP growth objectives. Compared with the alternative approach of having a fixed total amount of emission allowances, the current mechanism requires more intervention by the government. Moreover, there is a lack of penalty mechanisms for exceeding carbon emission limits. Absent a solid legal basis, the penalty measures are not strong enough to substantively change behavior. From a long-term perspective, this needs to be changed.

Given the fact that Chinese Government has set clear post-2020 objectives for Nationally Determined Contributions, the development of China's carbon market should be accelerated. The question of whether China is able to reduce mitigation cost is contingent, partially, on how healthy the carbon market will become. Compared with other ways of mitigation, a healthy and successful carbon market will enable China to realize the climate change mitigation expectations of the international community at a relatively low cost, thereby reducing the chances of constraining China's economic development and could offer a boost.

International experience has shown that a carbon trading market requires the participation of financial institutions and intermediary institutions, which help increase trading volume. Auction is the most effective way of distributing allowances, and can help improve liquidity.

Providing allowances free of charge can reduce political resistance, but should be gradually phased out as a method of distribution. The overall mitigation objective and the amount of allowances should be set at a reasonable level in order to prevent carbon prices from being too low. Regulatory bodies should not intervene in the carbon market excessively, but should allow the market to adjust automatically.

International experience also shows that energy efficiency and renewable energy development objectives can co-exist with and complement a carbon trading program. A carbon market or a carbon pricing mechanism alone is incapable of overcoming all market failures or barriers related to energy conservation and carbon mitigation.

6.3 Recommendations on the carbon market

6.3.1 A unified carbon market should be established step-by-step

China should develop its carbon trading system incrementally by planning in a unified manner, implementing step-by-step, and scaling up level-by-level. The first step is to develop a voluntary carbon trading market. After the institutional barriers and technical difficulties have been gradually overcome, the market can then be transformed into a mandatory one based on a national cap on total emissions. To establish such a mandatory carbon trading market, the following fundamental measures need to be taken in advance.

First, legal foundations for the national carbon emission rights trading market should be established to enable the transition from the current interim system. The development of *Regulations on the Administration of Carbon Emission Rights Trading* should be accelerated. There should be legal and institutional stipulations regarding such issues as: a) the industries participating in carbon mitigation; b) the compulsory nature of a carbon mitigation target; and c) the tradability of carbon products.

Second, a national cap on carbon emission rights should be set, and plans for distributing allowances should be developed. Initially, carbon allowances could be distributed for free; then, the proportion of allowances that are auctioned should be increased in stages to reach a point where all allowances are distributed by auction.

Third, the monitoring system and penalty mechanism for the national carbon trading market should be improved. Carbon accounting and reporting standards should be developed for key industries and enterprises. The regulatory bodies should develop clear and unified rules

regarding carbon monitoring procedures and carbon emissions calculation methodologies. The Carbon Trading Registration and Filing System should be improved. An information disclosure system for carbon emissions should be established so as to boost the motivation of participating parties. Relevant penalty measures must be imposed on the parties that do not fulfill mitigation obligations.

6.3.2 Financial institutions should be encouraged to provide innovative financial products

First, financial institutions should be encouraged to develop the range of services related to asset management, debts, intermediation services, and direct financing necessary to service the many parties in the carbon market. For this purpose, they may need to make changes to their institutions, facilities, staffing, and mechanisms.

- a. In terms of credit financing: Enterprises should be allowed to use emission rights reduction as collateral to obtain financing. Measures should be taken to first meet the financing needs of the enterprises that have made a commitment to comply with mitigation targets. Special loans could be provided for mitigation technology retrofitting or projects to upgrade facilities.
- b. In terms of intermediary business: Financial institutions should be encouraged to provide account convenience, R&D support, and intermediary services for emission rights trading. The development of civil institutions, intermediaries and third-party institutions capable of certifying mitigation technologies should be actively encouraged.
- c. In terms of direct financing: Eligible environmental enterprises or projects should be supported to issue debt financing instruments such as corporate bonds, corporate debts, short-term financing bills, mid-term notes, and asset-backed paper. Preferential measures should be taken to encourage private equity funds, venture capital, social donation funds and international aid funds to invest in environmental protection and resource conservation.

Second, with the maturing of the carbon trading market, derivative products such as carbon swaps, carbon futures, carbon options, and carbon assets securitization products can be developed. Such derivative products can not only provide hedges for carbon trading participants, but also are important for promoting the innovation of financial products and the diversification of financial markets.

Chapter 4: Promoting the Development of Green Finance through Public Finance

1. Public Finance has a Key Role to Play in Promoting Green Finance in China

1.1 Public financial policies can guide and promote the development of green finance

Public financial policy is an important tool for promoting the development of green finance, including through the national budget, taxation policy, national debt, and fiscal subsidies. The national budget represents the government's overall plan for financial revenues and expenditures at both the central and local levels. In China, budgets for local government are organized at different levels, including: provinces, cities with sub-districts, cities without sub-districts, and counties. The budget of the central government is comprised of the budgets of the individual ministries and commissions at the central level, the revenue turned over to central government by local governments, and transfers from the central government to local governments through tax rebates and subsidies. The national budget system usually covers the general public budget, the budget of governmental management funds, the budget of state-owned capital management, the social insurance fund budget, etc. The public finance system and associated policies can be used as powerful levers to guide the development of green finance.

The elements of the general public budget related to green finance include expenditures on energy conservation and environment protection, agriculture, forestry and water conservation, financial expenses, and the tax and non-tax revenue related to these areas. In the budget of the governmental management fund, there are five categories related to green finance, including subsidies for supplemental renewable energy power tariff, the ship oil pollution compensation fund, and others. There are four categories related to green finance within the state-owned capital operation budget, including expenditures on agriculture, forestry and water conservation, and expenditures on transportation.

Within funds managed by the central government, there are seven items related to energy saving and environmental protection, including the renewable energy development fund, ship oil pollution compensation fund, the fund for the disposal of waste electronic and electric equipment, and forest restoration fees. With the exception of the fund for renewable energy

development, the budget utilization of governmental funds for energy saving and environment protection is fairly low and, in the case of the forest restoration fee, decreasing year-over-year.

The nontax revenues which contain revenues related to green finance are those from administrative and institutional fees, such as supervision fees for securities, futures industry, insurance industry, and banking industry. Currently, China waives supervision fees for: securities investment funds and bonds; industry supervision fees for policy banks, commercial banks, and departments related to agriculture, farmers and rural areas; insurance institution supervision fees; and business supervision fees for agricultural insurance, family planning insurance, medical insurance, and critical illness insurance. As green finance develops in the future, financial institutions should also enjoy exemptions from fees related to their green credit, securities, and insurance businesses.

Within the tax system, the largest number of clauses related to green taxes are found within the value-added tax, consumption taxes, corporate income tax, resource taxes, vehicle and vessel taxes, and vehicle purchase tax. Corporate income tax has the most significant potential impact on green finance, accounting for about 20 percent of total tax revenues in China. At present, the corporate income tax rate in China is 25 percent. However, institutional investors' interest income does not receive any preferential tax treatment. Therefore, introducing income tax exemptions for green bond investors could make a substantial contribution to the development of the green bond market.

National bonds are issued by the central government to raise money mainly for military expenditure, balancing financial revenue and expenditure, and funding construction projects, which can include promoting the construction of green infrastructure. In recent years, the Chinese government has sought to strengthen its support for energy saving and environment protection and has introduced a range of subsidy and expenditure policies. In total, the government has promoted 13 fiscal subsidy policies, including the central environmental protection special fund, fund for prevention and control of heavy metals pollution, and subsidies for supplemental renewable energy resource power tariffs.

1.2 The role that financial policy has played in the development of green finance

China has unveiled a number of interest subsidy policies related to green credit. According to the results of performance evaluations, the “central environmental protection fund” and the

“heavy pollution prevention and control fund” both have proven effective in delivering results in pollution reduction, improving risk prevention, and providing solutions to critical problems in local areas.

Public investment in energy conservation and environment protection has greatly advanced the development of green finance. The Ministry of Finance set up the “central environmental protection fund” in 2004. Later, the central government successively established other special funds, including the Fund for Major Pollutant Emission Reduction and Prevention and the Heavy Metals Pollution Control Fund. During the 11th Five Year Plan period, funds dedicated by the Central Government for environmental protection rose to 74.633 billion yuan.

In 2006, the “211 environment protection” program was established within the budget, marking the first time that environmental protection was a specific accounting item in governmental budget expenditures. During the 12th Five Year Plan period, expenditures on conservation and environmental protection reached 1.29 trillion yuan. The total amount of investment into environmental protection during the 12th Five Year Plan period amounted to 3.4 trillion yuan or 1.5% of China’s GDP.

Since 2006, the NDRC has released a series of policies on power prices related to desulfurizing, denitrification, and dust reduction. At present, the supplemental desulfurization power tariff is 0.015 yuan/KWH; denitrification power tariff 0.01 yuan; and dust reduction power tariff is 0.02 yuan. These tariffs have played a significant role in encouraging coal-fired power plants to install pollution control equipment and reduce pollutant emissions.

2. Challenges in Using Public Finance to Catalyze Green Finance Development in China

2.1 The scale of fiscal support to the environmental sector is limited in relation to the challenges

While total investment into environmental protection reached 3.4 trillion yuan (equivalent to 1.41% of GDP) during the period of the 12th Five Year Plan, the level of investment was insufficient to meet the overall investment need. In response to the worsening environment, China has launched the National Air Pollution Control Action Plan and the Water Pollution Control Action Plan, and it plans to launch a Soil Pollution Control Action Plan. However, these plans will require substantial amounts of investment with the estimated needs for the

Air Action Plan alone expected to reach 1.7 trillion yuan over five years. The investment gap facing China remains quite large. In addition, the results achieved from environmental investments to date are not sufficient in scale given the amount of funds invested. Previous performance evaluations have found shortcomings in the use and management of funds set aside for environmental protection.

Amongst the allocations by the governmental management fund, the utilization within energy conservation and environmental protection funds has room for improvement. With the exception of the renewable energy development fund, the budget utilization rate of national environmental government funds is relatively low. This is partially because strict qualifying and implementation conditions and inflexible mechanisms result in many projects failing to qualify. As a consequence, the funds do not have enough projects to invest into and their budget utilization rate is low.

2.2 China could support green finance by enhancing its fiscal stimulus policies

Currently, China has not yet extended preferential tax policies to the green finance sector. For example, the tax incentives under the corporate income tax do not include benefits for institutional investors on their interest income from green investments. Once China completes its transition from a business tax to value-added taxation, the government could consider preferential value-added tax treatment for green finance.

Currently, there are not any tax preferential policies available for non-tax revenue related to green finance. Such non-tax revenue mainly comes from administrative and institutional fees including supervision fees for securities, future industry, insurance industry, and banking industry. In 2015, Ministry of Finance and the National Development Reform Commission (NDRC) have not announced any substantive preferential policies on tax deductions or exemptions for financial institutions offering green bond, credit, or insurance services, nor have they announced reductions or exemptions from regulation or supervision fees.

The mechanism for interest subsidies needs to be improved further. Currently, public finance places limited emphasis on interest subsidies for green loans. The rules and procedures relating to subsidy periods, subsidy standards, and application processes could be improved. Local governments currently make limited use of interest subsidies and financial authorities have no mechanism for delegating the management of interest subsidies for green credit to professional agencies (such as banks or their green credit divisions). Meanwhile, there are not

sufficient dedicated funds at the local level to cover interest subsidies for green loans.

2.3 The role of financial leverage could be improved

Government's national expenditures on environmental protection have remained too low and demonstrated a tendency to focus on near-term urgencies rather than long-term investments. From 2011 – 2014, 1.3 trillion yuan were invested under the 211 budget allocation with progressively larger sums year-over-year. The 211 budget line includes energy conservation, pollution, and eco-construction investments. During this period, pollution prevention and control accounted for approximately one-third of the expenditures, which is a sum equivalent to less than 1% of all government spending. Earmarked environmental funds are small and disparate, which limits their ability to develop synergies and scale impacts.

Fiscal support for market mechanisms needs to increase. Currently, public funding plays the leading role in green finance in China, but public resources on their own are not enough. It is essential to mobilize private capital and strengthen market-oriented approaches such as the use of PPP and carbon markets. For certain types of projects, such as ecological protection or primary research on low carbon technologies, it is possible to allocate public funds. However, for projects with commercial value, the government should use mechanisms that leverage private capital. The government needs to evolve its approach and increasingly seek a large impact through small expenditures.

Special funding for environmental protection within public budgets needs to adjust its approach to be more systematic and performance-based. The methods currently applied do not sufficiently link allocation processes to performance and effectiveness, and therefore do not create the right incentives for guiding the use of funds by regions.

3. Recommendations for Strengthening the Role of Public Finance in Green Finance Development

3.1 Increasing the scale of funding and diversifying channels

Work should be done to establish a National Environmental Protection Fund and diversify the financing channels to resolve underinvestment in environmental protection. Finance from the central government should be used to mobilize private capital through the use of low-interest or interest-free loans as well as loan guarantees. Low-interest and interest-free credit and financing guarantees should be used to support the contracting of third-parties for pollution

control (rather than the original polluter) and the procurement of environmental services. Banks and venture capital firms should also enjoy risk subsidies and revenue compensation for their environmental investment as a means to achieve multi-party participation and increase investment.

Dedicated environmental funds should be further integrated and managed much more closely on the basis of performance. The results of performance monitoring should be incorporated into decisions on fund allocations. For those pollution control projects, environmental special funds could deliver support by substituting rewards for subsidies and investments, requiring construction before providing subsidies, and requiring construction before awarding investment. Steps should be taken to clarify the division of authority between the central government and local governments and establish reasonable levels of environmental investment. Realistic estimations for expenditures in the 211 Special Protection budgets are needed.

The use of governmental management fund for energy conservation and environmental protection shall be expanded. Efforts should be made to relax the requirements of projects to qualify for subsidies and simplify the approval procedures. Further, the use of various governmental funds for environmental protection should be designed to mobilize sufficient private capital to close the funding gap.

3.2 Expanding fiscal incentives to contribute to green finance

Green finance should enjoy preferential tax treatment. Institutional investors buying green bonds should receive partial exemptions from corporate income tax on their interest income. Policy banks should be encouraged to give more support to environmental protection and green finance. Once business tax is replaced by Value Added Tax (VAT), institutions involved in green finance should receive preferential tax treatment under the new system.

The government should establish a new company or fund specifically focused on collaborating with private sector financial institutions to provide credit guarantees for green loans and provide credit risk compensation to providers of risk guarantees. Preferential tax measures can be instituted to reduce the operating costs of institutions providing credit guarantees for green finance.

The interest subsidy mechanism for green credit should be further improved. Work should be

done to increase the scale of funds available for interest subsidies, raise the subsidy rate, and either extend or abolish the ongoing three-year duration for interest subsidies. Efforts should be made to compile a list of projects that qualify for interest rate subsidies and simplify the approval procedures for the projects. In addition, China should benefit from international practice and authorize commercial banks to manage the interest subsidy system for green loans.

Nontax revenue incentives should be adopted to support green finance. Financial institutions offering green bond services, commercial banks offering green credit products, insurance providers offering green insurance products should all be given preferential treatment or exemption from supervision fees.

3.3 Strengthening support for public-private partnerships

The approach to operating national special environmental protection funds should be improved. The application of public funds to catalyze the use of PPP or third-party remediation should be encouraged when implementing comprehensive remediation, river remediation, and heavy metals pollution remediation to resolve challenges faced by local governments in securing both financing and suitable technical expertise for projects.

Government should encourage public-private partnerships, including further collaboration between the public and private sector on sewage and garbage disposal as well as other projects. Efforts shall be made to improve the government subsidy and compensation mechanisms for the construction and operation of environmental pollution control facilities. In addition, a risk compensation mechanism for private investment should be established, and performance assessments should be implemented on environmental protection projects involving collaboration between the government and private investors.

3.4 Implementing a performance monitoring and evaluation system

Implement a reasonable and scientifically sound system for monitoring and evaluating performance. The evaluations can be conducted by qualified third-party organizations. In addition, strengthen reporting on public finance for green finance, such as the role of public bonds in furthering energy conservation and environmental protection. In addition, public oversight and participation should be strengthened to guarantee efficiency in the use of public funds.

Chapter 5: The Role of Green Finance in China's Opening-up

Strategy

China's leadership of green finance within China also needs to be shown with regard to its investment overseas. This would make a very positive impact on the quality of investment in many countries. This chapter highlights the importance of deploying international best practices and promoting green growth while pursuing investment opportunities.

1. The Growth of Chinese Overseas Investments and China's Leadership Role

By the end of 2014, China's outward foreign direct investment (OFDI) stock in non-financial sectors reached 3.97 trillion yuan – 23 times what it was in year 2000. The average annual growth rate during this period was about 25%.³ At the same time, China's foreign aid has been increasing every year.⁴ It is predicted that in 2015, China's OFDI will exceed incoming foreign direct investment, which would be a milestone in the country's "Going Global" strategy and make China a net exporter of capital.⁵ With the rapid increase in China's overseas investments, environmental and social risks related to Chinese enterprises overseas have also increased.

Currently, China's largest overseas industrial investments are in the mining, and oil and gas industries. In Africa and Oceania, where natural resources are rich, these two industries accounted for 26% and 61% of China's OFDI respectively.⁶ These industries, and others such as the construction of large-scale infrastructure, present significant risks to the environment and local people. These types of investments often entail risks associated with, for example, increased soil, water and air pollution, the degradation of natural resources, and the resettling of communities.

³http://fec.mofcom.gov.cn/article/tjzl/jwtz/201501/1853462_1.html?COLLCC=2716141095&

⁴ China's Foreign Aid and Government-Sponsored Investment: Activities, Scale, Content, Destinations, and Implications. http://www.rand.org/pubs/research_reports/RR118.html

⁵ <http://www.mofcom.gov.cn/article/tongjiziliao/v/201501/20150100880913.shtml>

⁶ 《2014 年度中国对外直接投资统计公报》

Over the next 15 years, the global economy will need to invest about \$90 trillion in infrastructure assets.⁷The Global Commission on the Economy and Climate has shown that it does not cost more to invest in low carbon, low polluting activities than in traditional high polluting infrastructure, and there are additional economic benefits such as the reduced health impacts of air pollution, less vulnerability to volatile fuel prices, etc.⁸

China has the opportunity to demonstrate how financial institutions can shift overseas lending and investment towards environmentally beneficial sectors. It is spearheading two new financial institutions- the Asian Infrastructure Investment Bank (AIIB) and the New Development Bank (NDB) - as well as the Belt and Road Initiative. China's leadership in green finance can set a new standard for investing.

2. International Experience with Environmental and Social Risk Management

Foreign investment can lead to a number of environmental and social risks; however, these risks can be mitigated if properly identified in advance. These lessons can be divided into different types of risk that financiers and relevant other stakeholders have encountered. The chart in Annex I describes the types of risks an investor can face in both the host and investor country.

In developing environmental and social risk management systems, the financial institutions led by China can benefit from studying international experiences. Numerous public and private actors have embraced systems to reduce the potential negative impacts of their lending and investments. The World Bank Group, Asian Development Bank, African Development Bank, and Inter-American Development Bank, for example, all have environmental and social safeguard policies and performance standards. The importance of this issue is also recognized in other emerging economies as well. For example, the Central Bank of Nigeria has adopted sustainable banking principles requiring risk management due

⁷Estimates drawn from the *Better Growth, Better Climate* report of the Global Commission on the Economy and Climate (September 2014)

⁸ Marshal Brown, Yongsung Kim and Mattia Romani (2015) "Green Infrastructure: definition and needs" GGGI-G24. . These figures also include around \$100 billion per year of adaptation investments to make infrastructure more climate resilient. They do not take account of the potential to save up to \$300 billion capital investment per year from more compact cities, as estimated by the Global Commission.

diligence by financial institutions operating in sensitive sectors.⁹ The Central Bank of Indonesia has also adopted Green Banking Guidelines. The principles aim to balance economic opportunity with environmental and social costs. In 2011, Brazil's central bank instructed banks to monitor environmental risks as part of implementation of Basel III's Internal Review for Capital Adequacy. Last year, the central bank added a requirement that all banks establish environmental and social (E&S) risk management systems. In addition, a number of financial institutions from developing countries, including the Development Bank of Latin America (CAF) and the Indian National Bank for Agriculture and Rural Development (Nabard) have implemented their own environmental and social risk management systems.

The International Finance Corporation (IFC)'s Performance Standards on Social and Environmental Sustainability provide one good example of strong safeguards. A number of private financial institutions have committed to following the Equator Principles, which are modeled after IFC's Standards.¹⁰ These consist of a set of policy commitments related to key environmental and social areas of concern, including the resettlement of people, the degradation of environmentally sensitive areas, or the release of pollutants. They also emphasize the importance of stakeholder consultation, particularly with vulnerable groups in the communities affected by the project.

Early interventions provide long-term benefits. Studies have shown repeatedly that engaging proactively with local communities affected by investments, and protecting the ecosystems on which they rely, can reduce long-term costs for investors. In some situations, conflicts between communities and foreign investment have led to protests, violence, and even deaths. These conflicts have not only affected projects operations, but also resulted in significant financial losses and damaged the image of the investor countries. One specific example is the China National Petroleum Corporation, which experienced some of the potential costs of improper environmental management when it paid \$400 million to settle a dispute with the

⁹ <http://www.cenbank.org/out/2012/ccd/circular-nsbp.pdf>

¹⁰ The Equator Principles are voluntary E&S risk management guidelines officially adopted by 80 private and public sector financial institutions in 35 countries. The Equator Principles, based on the IFC Performance Standards, is a risk management framework that provide a minimum due diligence standard to support responsible decision-making. They apply to all industry sectors and a variety of financial products.

Chad government over environmental degradation resulting from its activities.¹¹

Early engagement with stakeholders can greatly improve the chances that an investment will be successful in the long-term. There is much evidence that shows that companies that succeeded in gaining community support for an investment documented significant financial savings.¹²

3. Policy Recommendations for China in the Opening-up Strategy

To help China smoothly implement its new financial initiatives and its “Going Global” strategy, the Task Force offers the following recommendations:

First, systematically integrate principles of sustainability into collaboration with countries receiving finance from the AIIB, NDB and the Silk Road Fund. China will benefit from actively championing environmental and social protections in its engagement with the countries in which it invests. Embracing opportunities for green investment and managing environmental and social risks in host countries will help China achieve the vision of promoting host countries’ sustainable development and regional interconnection.

Second, require financial institutions to establish and implement a standard for environmental and social risk management. To ensure competitiveness, these standards should be consistent with or better than the practices of international financial institutions. One step in this direction would be to strengthen the Green Credit Guidelines and make them mandatory for overseas investments. These standards should:

- a. Commit financial institutions to only provide finance to operations that can show that they implement certain environmental and social safeguards.
- b. Ensure effective stakeholder engagement at both the project and institutional level. This requires financial institutions to adopt information disclosure policies, grievance mechanisms and/or other methods for engagement with the public.
- c. Be accompanied by effective management systems with adequate staffing and appropriate incentive structures to ensure that the standards are effectively upheld.

¹¹ <http://www.bbc.com/news/world-africa-23697269>

¹² http://www.wri.org/sites/default/files/pdf/breaking_ground_engaging_communities.pdf

Third, require financial institutions to set green investment targets and reduce their support for polluting industries. Chinese financial institutions can support green growth by setting country-specific targets and magnifying the contribution of finance to green transformation. Chinese financial institutions should develop green infrastructure investment strategies and reduce investments in fossil-fuel energy projects.

Fourth, establish Ombudsman to handle grievances and requests for information from the public. The ombudsman can be an independent organization or departments in the ministries responsible for supervising overseas investment. This will help with stakeholder engagement and communication, and will allow people from China and host countries to request information and express concerns.

Fifth, integrate ecological civilization principles in cross border trade and investment. Chinese institutions should take into account sustainable development and the welfare of local communities when conducting trade and overseas investment, and help host countries avoid the old model of “pollute first treat later” which can create an impression that China seeks to export pollution to other countries.

4. China’s Leading Role as Chair of the G20

China will be the host country of the G20 Summit in 2016 and is showing great leadership by establishing a G20 Green Finance Study Group. This can play a critical role in promoting green finance among government, international organizations, financial institutions, and civil society. We suggest that the G20 Green Finance Study Group investigate the following aspects:

- a. How to build the capacity of banks and other institutional investors to assess green investments;
- b. The viability of requiring financial institutions to conduct stress tests on their exposure to high-risk sectors and their preference for green industries;
- c. The possibility of requiring listed companies and bond issuers to disclose environmental information, in order to enable capital markets to more easily allocate resources to green industries;
- d. The value of major financial markets establishing consistent rules on the definition and classification of green bonds, to facilitate cross-border green investments.

China's upcoming hosting of the G20 presidency offers an opportunity to provide international leadership. As demonstrated through the work of the UNEP Inquiry, green finance has emerged as an area of much interest and experimentation around the world. With its early efforts towards greening its financial system, China has already stepped forward to support the establishment of new sources of financing through, for example, the AIIB and the Silk Road Fund. China has practical experience to share and the opportunity to bring leadership to the global community in this critical area of global financial reform of institutions and incentives. Using the G20 as a platform, China has the opportunity to help springboard green finance from an emerging concept to a common international practice.

Chapter 6: Policy Recommendations on Promoting Green

Financial Reform in China

The policy recommendations of the Task Force on promoting the green financial reform in China are presented in this chapter. These recommendations address various aspects of the legal, institutional, and policy foundations needed to support the greening of the financial system and a sustained flow of resources to green investment needs.

1. Establish a Coordinating Mechanism at the National Level

The building of a green financial system is a process that requires collaboration across a range of actors. A strategic approach to reform requires consideration of four elements: the overall national development strategy, the scale and composition of green finance investment needs, the supply of green finance, and the environmental policy context that will convert need into demand and encourage new supply. However, these elements are influenced by multiple different departments within government, and driving successful reform will require broad-based collaboration across public agencies involved in finance, environment, economic planning, natural resource management, etc. Therefore, green finance reform requires innovation not only in policies and regulations, but also in institutional arrangements and organizational structures.

The Task Force recommends the establishment of a coordinating function at the level of the central government. The function could be established under the direction of the Central Committee's Leadership Group for Deepening Comprehensive Reforms. In addition, the relevant ministries and authorities should also establish new internal structures for the specific purpose of promoting green finance. The establishment of these new structures will enable more effective division of labor, coordination, and collaboration to achieve practical results.

2. Implement Measures to Create a Sustained Supply of Green Finance

Establishing and improving the legal foundations

The implementation of green financial reform relies on having a solid foundation of laws and regulations that establish rights, obligations, and incentives that drive behavior change. The

Task Force specifically recommends the following:

- a. Develop and implement more stringent and effective environmental laws, regulations, and standards. Environmental laws supported by strict enforcement are the prerequisite for generating real demand for green finance and generating growth opportunities for green industry. The current lack enforcement can allow polluting enterprises to obtain unfair competitive advantages by exporting the cost of their pollution, and can reduce the effectiveness of efforts to create demand for green finance.
- b. Incorporate environmental liability into financial laws and regulations. Lenders and other investors should bear appropriate liability for the environmental hazards associated with their investments. Clarifying the cost of and responsibility for environmental damage will raise awareness of the risks associated with financing energy-intensive and/or pollution-intensive industries. As institutions recognize greater risks, they will be motivated to implement due diligence and re-balance their portfolios appropriately.
- c. Implement mandatory disclosure of environmental information. Investors need standardized environmental information to identify, understand and determine the risks and opportunities of investments or projects. The Task Force recommends that the Securities Law and the Company Law incorporate provisions requiring listed companies and bond issuers to disclose environmental information. These provisions should include an article requiring companies listed in China or other venues approved by the State Council and companies whose bonds are traded publicly to periodically disclose environmental performance information. In addition, companies should be required to immediately report major environmental incidents to the securities regulatory bodies and the stock exchanges as well as make public disclosures to interested parties.

Rationalize the pricing and charging mechanisms for green industry

In order attract capital on a sustained basis, green projects must deliver financial returns that meet investors' expectations. Incentives and policy supports such as interest subsidies, tax deductions or exemptions, and guarantees can increase returns and enhance a project's creditworthiness, but the government's financial resources are limited. Rationalizing the pricing and charging rates incorporated into projects represents a more sustainable and effective approach to ensuring that projects generate attractive returns. Many green investment projects involve public goods to some degree and their ability to attract needed

private investment revolves heavily around decisions on pricing and charge rates.

With the promotion of PPP by the Chinese government, the very large green projects in many investment fields originally driven by governmental funds, such as watershed management and eco-city governance, have been opened to private investors. Such large green projects often involve investment amounting to tens of billions yuan, and contain numerous components in industry, agriculture, urban development, and other fields. Reasonable pricing and charging mechanisms are a must for China to attract and sustain a flow of private capital for green projects favorable to natural resources and environment.

Fiscal and tax policies can be enhanced to support green finance

The Task Force has six recommendations on enhancing fiscal and tax policies aimed at effective use of government funds. Given the limited nature of public resources, the cost-effectiveness of specific measures must be central. Funds must be allocated in a manner that generates the maximum leverage for green finance.

- a. Improve the interest subsidy mechanism for green credit, and establish incentives for green finance related to non-tax revenue.
- b. Establish a guarantee system supported by public financing.
- c. Enhance the efficiency of the use of funds dedicated to environmental protection through two steps. First, consolidate overall demand for environmental protection funds. Second, integrate and standardize special funds for environmental protection, and establish dedicated environmental protection funds within the central government budget.
- d. Increase the use of governmental funds for energy conservation and environmental protection.
- e. Enhance the use of tax incentives by implementing additional preferential tax policies for green financial products such as green bonds.

Build a bridge between supply and demand for green finance

Environmental laws, regulations and standards create both risks and business opportunities for financial institutions. Which industries will be affected by these environmental laws, regulations and standards and what will be the impacts on specific industry sectors? To which

environmental risks and opportunities will financial institutions be directly exposed? What risk management systems and risk management tools need to be developed to deal with these risks? Where will these changes drive new investment and create demand for finance? Most financial institutions have limited internal expertise on the environment and therefore often lack answers to these questions.

China must build bridges to strengthen the engagement between the environmental sector and the financial industry. The financial sector needs to better understand the financing characteristics, risk profiles, and business models underpinning green projects in order to find the business opportunities in China's green transformation. The development of international green finance has followed a process of integration between the finance industry and the environmental sector. For example, the United Nations Environment Program-Finance Initiative (UNEP-FI) has created a team of both environmental and financial experts; the World Bank employs a large number of environmental experts to work alongside its investment officers to develop tools and standards to guide its investments, including the International Finance Corporation's Performance Standards; the world's leading banks, such as Citibank, Deutsche Bank, and Standard Chartered, have established environmental risk and environmental markets departments to support their business units; the US Environmental Protection Agency supports a network of external Environmental Finance Centers that provide advice related to financing environmental projects.

Given the need to establish bridges between the professional realms of environment and finance, the Task Force recommends:

- a. Environmental protection authorities can improve the dissemination of information to the financial sector by establishing specialized teams and resources. The initiatives, laws, regulations, policies, and standards of environmental protection authorities, such as the recently promulgated Air Pollution Prevention and Control Action Plan, the Water Pollution Prevention and Control Action Plan, as well as the Soil Pollution Prevention and Control Action Plan to be promulgated, play an important role in converting potential investments needs into actual market demand for green finance. Environmental protection authorities must disseminate environmental information to financial regulatory authorities and financial institutions, so as to allow financial regulatory authorities to develop appropriate policies and measures to guide financial institutions towards green investment.

From international experience, environmental protection departments can play a role primarily in the following four areas. First, they promote environmental information disclosure jointly with financial regulatory authorities. For example, the United States Environmental Protection Agency (US-EPA) and UK Department for Environment, Food & Rural Affairs (DEFRA) issued regulations requiring companies to submit greenhouse gas emission reports in 2009 and 2013, respectively. Second, they establish various environmental protection funds to support the implementation of environmental protection actions. For example, US EPA and Department of the Environment in Australia have established various funds, such as water pollution prevention and control funds and soil restoration funds. Third, they support external research on innovative green financing. For example, the US-EPA as well as DEFRA have supported research on green finance. Finally, they provide green programs and projects with technical support and training on green finance. For example, US EPA has established the Environmental Finance Center Grant Program to fund nine universities to play the above role.

- b. The “One Bank and Three Commissions” can establish green finance guidance and implementation institutions. The “One Bank and Three Commissions” can play an important role in using environmental information to create policies that catalyze innovation in green financial service.

The Task Force recommends that the One Bank and Three Commissions set up green finance guidance and implementation institutions to undertake the following functions: 1) enhance coordination between financial policies and environmental policies; 2) research green financial policies, tools, and products by drawing upon information on green investment needs provided by environmental protection departments; 3) cooperate with other government agencies with green financial demands to launch and popularize pilot projects involving new policies, guidelines, tools, or products; and 4) guide financial institutions in implementing green investment activities.

- c. China can support well-known research institutions to build technical support teams for green finance. To better connect green financial supply and demand, China could benefit from a team of professionals with rich knowledge in both finance and environment. These professionals could help environmental protection departments and financial departments convert environmental information into useful financial insights and develop green financial policies and tools in response to green financing demand. China is recommended to support its academic institutions to lead the building of

technical support teams for green finance and can review the previously cited international examples.

Build the infrastructure for green financial development

Greening the financial system requires developing the tools, service infrastructure, and internal capacities to enable financial institutions to assess environmental risk and innovate their offerings. This includes developing the technical resources to support financial institutions such as environmental risk assessment criteria and procedures, databases to support green finance decision-making, green rating systems, and investment networks. In addition, the professionals working within the finance sector need access to training and capacity building resources in order for them to participate in developing the market.

3. Seven Breakthrough Priorities during the Thirteenth Five-Year Plan

The Task Force has identified seven priority fields for breakthroughs based on our analysis of financing needs and the Overall Plan for the Reform of Eco-Civilization System issued by the State Council on 21 September 2015. The Task Force recommendations include some fields already proposed within the Overall Plan for the Reform of Eco-Civilization System (such as green credit, green bonds, green securities and green insurance), but also proposes some additional fields. The Task Force recommends:

To launch a National Green Development Fund. The importance of green finance has been formally recognized within the 13th Five Year Plan coupled with a recommendation to establish a National Green Development Fund. Green industries will need increase in size and scale as well as undergo consolidation to become capable of innovating new technologies and improve their international competitiveness. However, public subsidies on their own cannot deliver the level of finance needed to support such an upgrading of the sector. Further, bank loans have been the primary source of green financing in China, but not all companies can access bank financing. A national fund could provide a valuable link in the financial system by providing equity that can be leveraged to enable access to other financing channels such as bank loans and provide support investments into industry upgrading.

The Task Force recommends establishing a National Green Development Fund with a focus on medium-to-long term equity financing for large-scale projects. The Fund could be established with a goal of reaching 300 billion RMB over time using a combination of

various public funds, development funds, and investments from other major financial institutions and companies. Operating with a market orientation under professional management, the purpose of the Fund should not be profit maximization, but rather to operate on a commercially sustainable basis while also delivering public benefits. The Fund also could have the option of developing specialized sector funds as well as funds targeted at specific regions such the strategic economic development zones identified by the government (e.g., Jing-Jin-Ji/Tianjin-Beijing-Hebei area).

To develop green bonds. China will see significant development of its direct financing market, especially the bond market, in the next 15 years. The main funds supplied in the bond market are stable, mid-long-term funds and available at a reasonable financing cost. The Task Force recommends: (1) to issue guidelines for green bonds by the regulatory authorities; (2) to define and classify green bonds; (3) to consider provide tax exemptions for the interest from green bonds; (4) to support the development of green bonds with modest interest subsidies and credit enhancement policies; (5) to build an environmental performance tracking and evaluation system for green bonds.

To green banking systems. China's financial system is dominated by loan financing, and thus the banking industry plays a decisive role in China's financial system. The main source of green investment funds will remain loans for quite a long period to come. The Task Force offers the following recommendations. (1) establish specialized green credit and banking functions within existing banks; (2) increase the interest subsidy for green loans, and improve the interest subsidy mechanism; (3) increase the environmental legal liabilities of banks; and (4) embark on a major program within commercial banks to build capacity to assess environmental risks and opportunities (see previous section).

To implement compulsory environmental liability insurance. The frequency of environmental accidents in recent years, especially the recent Tianjin blast, demonstrate the importance of introducing compulsory environmental liability insurance. The Task Force recommends: (1) to develop the regulations for trial implementation at the local level (prefecture-level cities) first and then expand to the provincial and national level; (2) to develop the list of entities subject to mandatory environmental liability insurance; (3) to explore financial subsidy and preferential tax policies to support mandatory environmental liability insurance; and (4) to set up a unified national organization to underwrite environmental pollution liability insurance or to set up an information sharing platform.

To develop green PPP Project financing. It has become increasingly difficult for the government to continue shouldering the responsibility for supplying many environmental public goods in the face of environmental pressures. Thus there is an urgent need to increase the participation of private funds into the supply of such public goods. The active participation of public finance can help the PPP model resolve the barriers to attracting private investors created by the comparatively low return and credit profile of investments in the field of environmental services. A PPP project financing platform can facilitate diversified financing for large-scale green projects from multiple sources, such as fiscal funds, loans, bonds, and private equity funds, and reduces financing costs.

The Task Force recommends: (1) to include government payments and operating subsidies involved in environmental protection PPP project financing in the fiscal budget, so as to form a budget guarantee mechanism; (2) that the government considers engaging in the operations of SPV companies through equity investment when financing regional environmental protection PPPs; (3) to promote and support the operations of regional environmental protection PPP project funds; (4) to build a green financial innovation system with the support of PPP environmental protection funds; (5) to establish and improve the structure of tax incentive policies for PPP; (6) to improve the pricing and charging mechanisms for public services in the environmental protection field.

To establish a green channel in the IPO process. The environmental protection industry is an asset-heavy industry to some extent, and technical innovation is more likely to be successful in large-scale enterprises. Both the National Development and Reform Commission and Ministry of Environmental Protection have introduced policies to encourage the establishment and development of large-scale environmental protection enterprises. For example, the Ministry of Environmental Protection has introduced the Twelfth Five-Year Development Plan for Environmental Service Industry. The plan calls for consolidation of the environmental protection industry and fostering the emergence large environmental protection enterprises. The Ministry of Finance, the National Development and Reform Commission, the Ministry of Industry and Information Technology, and the Ministry of Environmental Protection jointly issued the Implementation Plan for the System of Environmental Protection Leaders in 2015, calling for the active cultivation of large-scale environmental protection enterprises. Securing financing through public listing on stock market is a step in the path to grow into large-scale enterprises.

The Task Force recommends to simplify the IPO review or filing procedures for companies

that meet the definition of green enterprises. Restrictions on the amount and proportion of the raised funds eligible for use as working funds of green enterprises or for repaying bank loans should be eased. Policy makers may refer to the special policies for enterprises planning to be listed within the affected region after Wenchuan Earthquake and within the Western Region, including Xinjiang and Tibet, after 2012. Similarly, priority should be given to green enterprises in the IPO review process, and allow them to list on the Shanghai Stock Exchange or the Shenzhen Stock Exchange.

IPOs have temporarily been suspended, so it is not possible for green enterprises to be listed on the main board in the near term. Therefore, it is suggested that National Equities Exchange and Quotations undertakes measures to encourage green enterprises to be listed on its platform for equity transfer. Policy makers may also develop preferential policies for green enterprises if they decide to participate in pilot projects for qualified enterprises to transfer to another board.

To establish a carbon trading system and promote carbon finance.The Chinese Government has recently announced its plan to create a national cap-and trade system by 2017. By so doing China can demonstrate how to reduce emissions at lowest costs. China's bold decision will influence many other countries. To be successful it will necessary to encourage financial institutions to develop innovative carbon financial products: (a) to allow financial institutions to accept carbon emission permits and emission reductions as collaterals, so as to raise the credit line granted to environmental protection enterprises; (b) to allow financial institutions to start loan business for technical transformation projects and equipment upgrading projects in the field of energy conservation and emission reduction; (c) to encourage financial institutions to provide convenient accounts, R&D support and intermediary services for green enterprises involved in carbon emission trading; (d) to actively promote the development of non-government institutions, intermediary institutions, and third party institutions qualified for emission reduction technology certification; (e) with regard to direct financing, to support qualified environmental protection enterprises or projects to issue enterprise bonds, corporate bonds, short-term financing bills, medium-term notes, asset-backed notes and other debt financing instruments.

4. Greening China's Overseas Investment

As noted in Chapter 5, China's growing role in international investment offers a remarkable opportunity to influence the sustainability of investment internationally. The Task Force

therefore recommends:

To include green finance in the agenda of 2016 Summit of the G20. China will be hosting the G20 Summit in 2016 and is showing great leadership by establishing a G20 Green Finance Study Group. The Task Force suggests that G20 Green Finance Study Group investigate the following aspects: (1) how to build the capacity of banks and other institutional investors to assess green investments; (2) the viability of requiring financial institutions to conduct stress tests on their exposure to high-risk sectors and their preference for green industries; (3) the possibility of requiring listed companies and bond issuers to disclose environmental information in order to enable capital markets to more easily allocate resources to green industries; (d) the value of major financial markets establishing consistent rules on the definition and classification of green bonds, to facilitate cross-border green investments.

To adhere to the principles of green finance in China's overseas investment. (1) integrate principles of sustainability into collaboration with countries receiving finance from the AIIB, NDB and the Silk Road Fund; (2) require financial institutions to establish and implement a standard for environmental and social risk management; (3) require financial institutions to set green investment targets and reduce their support for polluting industries; (4) establish Ombudsman to handle grievances and requests for information from the public; (5) Integrate ecological civilization principles in cross border trade and investment.

5. Strategic Roadmap for Green Financial Reform

Green financial reform is a long-term process of developing institutions and markets. The research group proposes a roadmap that divides the implementation of green financial strategy in China into three phases:

Phase 1 (2016-2020): the launch of green financial reforms.

The upcoming period of the Thirteenth Five-Year Plan offers an opportunity for government to lay a sound foundation for green finance. Establishing the necessary enabling conditions for green finance includes:

- Establishing the legal foundations for green financial reform, including strengthening enforcement of environmental laws;

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- Improving fiscal and tax policy support for green financial reform;
 - Rationalizing the pricing mechanisms for green industry; and
 - Building a bridge between supply and demand for green finance.

During this time period, China will also launch major initiatives in water pollution control, air pollution control, and soil pollution control, which will all require substantial funding. The Task Force has recommended “six breakthrough areas” upon which to focus policy reforms and the development of market tools.

China can also use this period to launch pilot projects in the strategic economic areas such as the Beijing-Tianjin-Hebei region. Green finance pilot projects can influence the flow of capital during the course of developing these strategic areas and accelerate their green economic transformation. Successful pilot projects will provide valuable learning opportunities that support promotion of green finance at the national level and accelerate the green transformation of the Chinese economy.

During this period, green growth should also be encouraged, particularly where the private sector can be motivated to undertake green investments on the basis of limited public support. Increased emphasis on environmental regulations will stimulate more private investment into pollution reduction and improving resource efficiency. Government funds may particularly be needed for areas such as soil remediation, but many innovations such as green bonds, green credit, and carbon finance can equally enable markets to address pollution control as well as deepen investments into areas such as energy efficiency and improved management of resources. These investments will lower the costs of and demand for pollution control in Phases II and III.

China can also use its leadership role in the G20 presidency and in the establishment of new institutions such as AIIB and BRICs bank to raise attention internationally on the subject of green finance. China can help catalyze global discussion and share its experiences in this area.

Phase II (2021-2025): the deepening of green financial reform.

During this period, China will start to see improvements in the environment from the increased flow of finance to investments in cleaner production and resource efficiency projects in Phase 1. The second phase will contribute to the maturation and diversification of green finance by deepening reform and building on successes of the first phase. Key tasks in

Phase II will include:

- Consolidating lessons from pilot projects and research to further improve the institutional systems, mechanisms, and policies that support green finance;
- Deepening research on the characteristics of cleaner production and resource efficiency projects to support innovation in policies, financing platforms and market instruments;
- Building on the success of green credit to further deepen green bond markets and green capital markets;
- Deepening the reform of the pricing and charging mechanisms for resources and environmental services;
- Following on the establishment of a national carbon market by introducing increasingly sophisticated carbon finance products; and

Expanding international cooperation in the area of green finance, and taking a leading role in establishing international standards for green finance.

During the first phase, banking will likely remain the most significant source of finance for green investment. However, a key priority of the second phase should be to grow other segments of green finance to achieve a deeper and more diverse market.

Phase III (2026-2030): the comprehensive greening of the financial system

During the course of Phase II, China is expected to have completed its transition to the New Normal (“新常态”) and will enter into a new phase of its economic growth. In the late stage of green transformation, the focus of green finance should be on completing the greening of the entire financial system and to support China in completing its evolution into a green, low-carbon society. This phase will involve four key tasks.

First, build a green finance culture and value system on the basis of China’s eco-civilization construction and progress the full greening of the financial system.

Second, incorporate the dual concepts of low carbon and environmental protection complete the embedding into the core of financial policy-making such as monetary policy.

Third, continue to bring China’s experience in green finance and green transformation to

other developing countries through platforms such as the Belt and Road Initiative. China's experiences can serve as a valuable reference for developing countries and can contribute to changing the global development path.

Fourth, further integrate China globally as a leader in the green finance community.