



**China Council for International Cooperation on
Environment and Development**

National Governance Capacity for Green Transformation

Final Report

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MAJOR FINDINGS

Green transformation aims at creating an inclusive prosperity while maintaining the sustainability of natural ecosystems, connecting green transformation requirements to national economic development, bringing about a fundamental shift in the way people live, and promoting collective social ideas. Different from conventional approaches, environmental governance for the green transformation requires systematic and forward-looking reform for the development of the national governance system and governance capacity building. Xi Jinping, General Secretary of the Chinese Communist Party, discussed the national governance system and governance capacity stating: “China's national governance system can be understood as a full set of closely linked and coordinated national systems through which the country is governed under the leadership of the Party. It consists of institutions, mechanisms, laws, and regulations with regard to economy, politics, culture, society, ecological progress, and Party building. China's national governance capacity refers to our capacity to administer various social affairs through the application of national systems. This includes promoting reform, development, and stability, handling domestic affairs, foreign affairs, and national defense, and governing the Party, the state, and the armed forces”.¹

The national governance system needs close collaboration among the government, market, and society. The Task Force's discussions about the green transformation of national governance capacity focused on these three dimensions. The Task Force considered national governance capacities as including the ability of the government to make and enforce rules, the market to internalize externalities, and the public and social organizations to participate in environmental protection. Key factors influencing the ability of these actors to effectively play their roles are: having a good institutional environment, a reasonable incentive system, a guarantee of adequate human, financial, material, technological, informational, and other resources that correspond to the responsibilities of actors, and competences of government officials and social organizations. After assessing the environmental governance capacities of the government, enterprises, and society, the Task Force identified various deficiencies that could affect China's green transformation.

¹ Xi Jinping, Aligning Our Thinking with the Guiding Principles of the Third Plenary Session of the Eighteenth CPC Central Committee, *Qiushi*, January 2014.

(1) The capacity of the executive and legislative branches of the state to make policies in a scientific and democratic way. In terms of the institutional environment, there is still a shortage of laws and regulation guaranteeing the participation of multiple stakeholders in the process of institutional construction and policy-making. The rules for selecting and removing experts from the policy-making process need to be better institutionalized; the Current procedures are not transparent and responsibilities are not clear. There is no legal requirement on conducting cost-benefit analysis in making rules. In terms of resources, although the People's Congress is the legislative body of the country, it still lacks full-time personnel who can provide support in decision-making. Furthermore, a robust information collection and distribution system is still lacking, and the information necessary for institutional construction and policy making is insufficiently comprehensive or complete. In terms of the competencies and environmental consciousness of policy-makers, it will be important to improve how the information system is integrated in decision-making and policy makers have inadequate knowledge on green development.

(2) The capacity of the executive branch of the government to implement policies and the capacity of the judiciary to adjudicate. In relation to the institutional environment, the power, responsibilities, and abilities of officials is not commensurate with the needs of the organizations and institutions which influence the enforcement of the government's green transformation policies. The inconsistencies found in policies can be linked to the abilities of administrative departments and in particular, of environmental protection law enforcement departments. In terms of the incentive system, one reason for why government officials have neglected environmental protection is the insufficient consideration given to environmental performance indicators in the promotion system. In terms of safeguarding resources, there are maldistributions of resources among government agencies, both horizontally and vertically; the responsibility of regulatory departments at different levels is often not matched by adequate resources. Green transformation is knowledge-intensive, yet the major mode of government supervision of activities is currently still "physical". The abilities and degree of awareness of the green transformation among public officials needs to be enhanced. This includes a focus on their basic understanding of and attitude towards the green transformation and their learning skills and operational skills.

(3) The capacity of the market to incentivize green innovation and to internalize environmental externalities. At the institutional level, price reform of important resources is still lagging behind; the government's economic incentive policies for the green transformation of enterprises through finance, taxation, standard

setting, and the like are not without flaw. Green innovation suffers from unfair competition because in some fields enterprises of different ownership types are still treated unequally and there are still problems of local protectionism. In terms of the incentive system, enterprises have difficulty in translating reputation in environmental protection into real economic benefits. The market for environmental industry is still not mature, so the market fails to play a decisive role in the allocation of resources or to provide positive incentives for green development by enterprises. In terms of resources, the governmental capacity for green innovation is inadequate which make green business model initiatives gain inadequate governmental support. In terms of the capacities and environmental awareness of enterprises, many small- and medium-sized enterprises (SMEs) do not participate in the green supply chain system due to financial constraints, lack of trust between enterprises, and the state of their technical knowledge, environmental standards, or taxation policies. The concept of green development is not well understood, especially among those enterprises causing serious pollution, nor is the idea of a green supply chain well appreciated. The overall sense of social responsibility for the environment is inadequate.

(4) The environmental awareness of the general public and the capacity of social organizations to facilitate green innovation and environmental protection.

In terms of institutional environment, there is still a shortage of laws and regulations facilitating the participation of the public in environmental protection; the overall political environment for the development of social organizations related to environmental protection needs to be improved. The rights and responsibilities of the public to the environment require clarification. In terms of resources, there is still a lack of information and institutional means for the public and social organizations to participate in environmental protection; full-time workers and budgets for the participation of the public and social organizations should be added to environmental protection departments. To enhance the competencies and environmental consciousness of the public and social organizations, green values must be spread. The public still lacks the knowledge and skills required for participating in environmental protection. Environmental protection social organizations still face such problems as small size, inadequate funds, and lack of skilled individuals.

Lastly, the Task Force singled out four major deficiencies in national governance capacity which deserves special attention. First, the competency of the governmental officials for green transformation needs great improvement, as they are the ones who take lead to make and enforce rules. Second, the governance responsibilities, capacities and accountability for the green transformation are not well aligned. Green transformation is a new mode of development. The existing arrangement of power

and responsibility is inadequate to meet the needs for such a transformation. Third, the institution and system for information collection, integration, use and disclosure needs to be built. Information is crucial for making and enforcing rules, and is critical for the public and social organizations to participate in and supervise environmental protection. Fourth, the abilities to carry out social innovation and technology innovation for green transformation are inadequate.

POLICY RECOMMENDATIONS

Green transformation requires systematic reform for the development of the national governance system and governance capacity building. In 2014, the Task Force on “*Institutional Innovation for Environmental Protection in the Context of Ecological Civilization*” of the China Council for International Cooperation on Environment and Development (CCICED) issued a detailed study on environmental protection systems and proposed policy recommendations on building institutions for environmental protection. The Task Force focuses on national governance capacity for green transformation, but also proposes policy recommendations on institution building conducive to a strengthened governance capacity. Enhancing governance capacity for the green transformation means "enhancing the role of the government to lead and regulate, encouraging an active role on the part of business, and promoting the participation of, and supervision by social organizations and the public."

The Task Force believes that a strong institutional environment, an adequate incentive system, the matching of resources to responsibilities, and the competencies and environmental awareness of individuals are key factors influencing the roles of government, market, and society in the green transformation. Steps to be taken to advance a comprehensive strengthening of governance capacity for the green transformation during the next 15 years (to 2030) are proposed with a focus on these four factors. Lastly, a few supplementary recommendations are also proposed in relation to the newly issued *Integrated Reform Plan for Promoting Ecological Progress*.

Within the first 5 years, a focus should be placed on creating an institutional environment which can promote the green transformation through legislative and policy changes and the creation of an adequate incentive system. Within 10 years, matching resources with responsibilities can be achieved through assessing the resource needs of regulatory agencies. Within 15 years, the goal of green social values should be achieved through demonstration, education, and other means. Green transformation requires the involvement of the whole society and there is a high degree of consensus of the whole society on the necessity of green transformation, which makes national governance capacity building for green transformation an ideal experimental field for a comprehensive reform on improving overall national governance capacity. Specifically, the Task Force recommends:

(1) Enhance state capacity for making policies in a scientific and democratic way by using scientific analysis to inform policy making and enabling

stakeholders to participate in the policy making process and in forging consensus. The state should promote evidence-based policy making with regulations, establish mechanisms to form and close down specialized committees of all kinds serving the government, establish a guaranteed legal right to, and ways for pluralistic participation in the formulation of laws, regulations and policies, and enhance the transparency of the policy-making process, thereby also minimizing the influence of interest groups in policy making. Strengthening cost-effectiveness analyses tied to policy making can prevent excessive gaps between policy goals and outcomes. Sufficient supporting staff with adequate professional qualities should be provided to support legislative decision making for the fulfillment of the green transformation by the People's Congress. Policymakers should also be trained in how to make scientific decisions and policies.

(2) Enhance the capacity of the executive branch of government to implement policies and the judiciary to adjudicate. The state should make establishing the legal foundations for a green transformation a priority. The State Commission Office for Public Sector Reform should improve the complementarity of policies between departments of the State Council responsible for making and enforcing various policies. The state should implement legislative and administrative reforms to realize a sound horizontal and vertical division between rights and obligations and bring into alignment the rights, responsibilities and capacities of departments, and list environmental performance indicators in all the relevant evaluation systems for public officials to make sure their power matches their responsibilities in environmental protection and thus to change the status that environmental departments are solely held accountable for environmental protection. Regulations should be enforced to regularly review governance capacities for the green transformation at different levels of government. The State Council should take the lead in coordinating policies among the Ministry of Environmental Protection, the Ministry of Public Security, and the judicial branch of government to enhance the ability to enforce environmental laws. The government should add the fulfillment of duties for green transformation to the various appraisal systems for officials. Training should be provided to public servants on knowledge relevant to green transformation.

(3) Enhance the capacity of the market to incentivize green innovation and to internalize environmental externalities. The responsible agencies should reform the pricing mechanisms of important resources to incentivize the efficient utilization of resources, and set fiscal and taxation policies in such a way as to account for environmental costs in both production and consumption. The state should maintain a fair and competitive marketplace for green practices. The government should take the

lead in facilitating the creation of a green market by such measures as green public procurement. The government can use taxation policies to incentivize enterprises to practice green supply chain management, and thus promote technology innovation and industrial upgrading. An environmental credit system for enterprises should be established which accounts for capital costs and environmental costs in the same system, and at the same time basic information for implementing green financing needs to be provided. A green resources and technology sharing network could be established jointly by the government, enterprises, and research institutions.

(4) Increase the environmental awareness of the general public and enhance the capacity of social organizations to facilitate green innovation and environmental protection. The rights and responsibilities of the public to participate in environmental protection should be further clarified with laws and regulations. The channels and procedures for the public and social organizations to participate in environmental protection should be institutionalized. The responsible agency should rename the “Department of Education and Communication” of the Ministry of Environmental Protection to “Department of Education, Communication and Public Participation” making it responsible for promoting public participation activities. The coordination between governmental departments and social organizations should be strengthened through the establishment of various mechanisms for communication and coordination, information sharing, and project collaboration. Governmental support for environmental social organizations should be enhanced, especially in terms of funding, skilled individuals, and information. In addition, the threshold for the registration of environmental social organizations should be lowered. Innovative education and communication strategies should be developed to promote green consumption and environmental protection.

(5) Lastly, the Task Force singled out four policy recommendations which are considered as the critical ones to improve national governance capacity for green transformation. First, the government should promote a culture respectful of nature and natural resources. The green knowledge and skills of public officials and social organizations should be improved through education and training. Second, by analyzing the basic requirements for a sound social management of the green transformation, the responsible agency should identify the responsibilities of all governmental agencies engaged in the green transformation and incrementally align resources to match with these responsibilities. Third, uniform rules should be developed for information management, rights of access and mechanisms to use information for scientific research, evidence-based decision making, and public participation in the policy process. Steps should be taken to assure data is accurate

and reliable. Training should be provided to data collection and management personnel. Fourth, environmental information disclosure should be greatly promoted, including the status of pollution and its impact on human health. To disclose such information may incur mass outcry in the short-term, but in the long run, it helps to eliminate information asymmetry, increase environmental awareness, and reduce the obstacles for green transformation. Fifth, proper incentive systems should be designed to encourage innovation.

BACKGROUND

Rapid economic growth in China since the reform and opening up policy was adopted, has brought a fundamental improvement in living standards, but has also caused severe ecological damage, environmental pollution and depletion of resources. To achieve sustainable economic and social development, China will have to embark on a green transformation of the economy and lifestyles. On November 12, 2013, the Third Plenary Session of the 18th Central Committee of the Communist Party of China made a call for speeding up the construction of ecological civilization in the *Decision on Major Issues Concerning Comprehensively Deepening Reforms*.

Seeing many serious problems in the governance capacity for the green transformation and the promotion of an ecological civilization of the existing system, the China Council for International Cooperation on Environment and Development (CCICED) has sought to focus attention on governance capacity issues related to the green transformation as called for by these reform policies. The CCICED Task Force, *National Governance Capacity for Green Transformation* was given a nine-month remit and entrusted with proposing a comprehensive framework for enhancing governance capacity for a successful green transformation, with a focus on the next fifteen years (through 2030).

The Task Force brought together domestic and international experts and practitioners who discussed and refined definitions of green transformation and national governance capacity and took on four tasks: (1) synthesizing the status quo of national governance capacity for the green transformation, (2) identifying deficiencies in national governance capacity for the green transformation, (3) surveying innovative practices in China and other countries for strengthening governance capacity for the green transformation, and (4) proposing short, medium, and long-term policy recommendations for how to strengthen governance capacity.

The Task Force paid visits to Zhenjiang, Jiangsu province and Europe (Brussels and the North Rhine Westphalia, Germany) to collect first-hand information on green practices. Zhenjiang is one of China's low carbon demonstration cities. Here the Task Force gathered information about various aspects of the city's green transformation, including its macro-level strategic planning processes, its micro-level practices tied to upgrading industry, pollution control, remedying degraded ecological systems, local institutional innovation and mechanisms for promoting green development, as well as the way the city has involved enterprises and social organizations.

In the European Union, the Task Force was introduced to various instruments

being used to influence the behavior of member states towards a green transformation, including the management and enforcement of European Union environmental law and monitoring of air quality. In Germany (North Rhine Westphalia) the Task Force was informed about the processes to prepare a climate protection plan in Germany's industrial heartland, and the city-led scenario-based multi-stakeholder engagement process adopted by the innovation city Bottrop.

The Task Force examined national governance capacity for the green transformation in relation to the capacity of the government, market and civil society to carry out green transformation. That is, the capacity of: (1) the government to make and enforce rules, (2) the market to internalize externalities, and (3) the public and social organizations to participate in environmental protection.

The Task Force identified key factors affecting these capacities, including the institutional environment; incentive systems; the fit between human capital, financial material, technological and informational resources and the responsibilities of organizations; and the competencies and awareness of actors (governmental officials and civil servants, enterprises, the public, and social organizations). Based on these factors a framework for analyzing national governance capacity for green transformation was developed. After identifying deficiencies in these four dimensions, policy recommendations for enhancing national governance capacity for the green transformation were proposed. The final report was written based on extensive discussion and consultation.

It is important to mention that important policies were made by the central government during the implementation of this project. In May 2015, the Opinions of the Central Committee of the Communist Party (CCCP) and the State Council *on Accelerating Development of Ecological Civilization* were released. The opinions concretize the concept of ecological civilization and provide important directions for the green transformation. In September 2015, the State Council and the Central Committee of the CCP released the *Integrated Reform Plan for Promoting Ecological Progress* in order to build a systematic and complete system for ecological civilization construction. The Task Force considers the institutional environment be one of the key factors affecting the capacities of the government, market, and civil society, and proposed recommendations on how to improve the institutions which are addressed in the *Integrated Reform Plan for Promoting Ecological Progress*.

Keywords: green transformation, governance capacity, government, market, civil society

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PREAMBLE

Green transformation aims to generate inclusive prosperity while maintaining the natural systems that sustain us. Green transformation is more than a new mode of economic growth; it redefines the relationship between environmental protection, economic growth and social progress. In this new paradigm, economic and social development and environmental protection reinforce each other to realize the visions of economic prosperity, social harmony, clear water and green mountains.

Green transformation is not only a process where state interventions correct for negative externalities created by the market, but also a process of avoiding state failures which hamper environmentally benign economic and social development. The greening of the market will require guidelines, support for the development of businesses aiming to protect the environment, and removal of subsidies for industries which harm the environment and society. As key players in the market, enterprises of all sizes should be encouraged to develop green businesses and pursue green technological innovations with supportive framework conditions.

Green transformation encourages public participation, as well as social consensus and trust building. Through engaging in environmental protection, citizens, social organizations, and businesses gain deeper appreciation of public service and its practical significance. Open dialogue, access to reliable information and consensus building processes regarding public values and the goals of green transformation are necessary to build mutual trust among society, economic players and the government, and for shaping a mature social governance system.

The green transformation will require a process of redistributing as well as better integrating various administrative powers and resources. The existing system is highly fragmented, which leads to inefficiencies, redundancies, and at times even counter-productive decisions. A green transformation must be cross-cutting as it affects essentially all sectors and issue areas: buildings, energy, transport, finance, agriculture, consumption, waste, etc. This means the green transformation will involve many governmental departments at all levels of government. It is imperative to optimize the distribution of power and resources both horizontally and vertically.

The requirements for strategic planning, policy making and enforcement, and monitoring and supervision for the green transformation are different from those for traditional development. The green transformation will be knowledge-intensive. Officials at all levels of the bureaucracy will have to be schooled in ecological civilization and green transformation objectives and implementation procedures and

transform their value systems to embrace these aims. Routine administrative decision making is insufficient for guaranteeing effective policy making and enforcement. Bureaucrats have to be equipped with systematic knowledge on how to integrate environmental protection, human health, and social progress objectives into economic decision making and to advance the green transformation by integrating macro-level green development strategies into micro-level policies and measures.

Green transformation requires complementarity in the roles played by government, market and civil society in addressing market and government failures. Such cooperation will enable government, businesses, and citizens to reach their full potential. Under a governance system for the green transformation, economic growth, technical and social progress, and the professionalization of the bureaucracy must advance simultaneously.

CHAPTER 1 NECESSITY AND CHALLENGES OF GREEN TRANSFORMATION

1.1. Green Transformation

Green transformation aims to maintain the sustainability of natural ecosystems while creating an inclusive prosperity. It encompasses similar concepts like the green economy, circular economy, and low carbon economy. Green economy stresses the improvement of resource efficiency; circular economy focuses on the dematerialization of material inputs (e.g. reducing, reusing and recycling waste); low carbon economy aims at the rapid improvement of energy efficiency and the deployment of renewable energy. The concept of green transformation is broader and more inclusive, going beyond the economic sphere to include the economy, society, environment, and resource use.

Decoupling economic growth from the use of natural resources is a necessary condition, key indicator and main driver of the green transformation. Two key indicators are resource decoupling and impact decoupling. Resource decoupling means reducing the use of resources per unit of economic activity by raising resource productivity; impact decoupling means raising economic output while reducing negative environmental impacts. Relative decoupling occurs when economic growth is greater than the growth rate of resource use or environmental impact. Absolute decoupling means an absolute reduction in resource use regardless of economic growth.

1.2. Necessity of Green Transformation

China's rapid economic development has placed tremendous pressures on the environment. The carrying capacity of many ecological systems has been exceeded. Air, water, and soil pollution have reached critical levels resulting in major economic losses. The public is increasingly concerned about the health impacts of environmental pollution and expects better environmental quality.

In the face of the economic slowdown, China will need to find a means to ensure macroeconomic stability and promote sustainable economic development while improving environmental quality, protecting the natural heritage, and respecting ecological red lines. China will have to promote economic restructuring away from investments in heavy industry towards research and development in green business fields and energy restructuring. It will need to coordinate the development of urban and rural areas, deal with severe environmental pollution problems and environmental

degradation, and cope with new and more complex environmental pollution issues, like climate change, biodiversity loss, persistent organic pollutants, and loss of resources.

The traditional mode of pushing economic growth at the expense of the environment is not sustainable and is no longer feasible under the “new normal”. Green transformation is the inevitable choice for a paradigm shift to a new type of social and economic progress and to opening a new era of development. China needs major adjustments to its energy and industrial structures to realize the green transformation. Doing so will support efforts to maintain better economic growth, improve environmental sustainability, and promote a socially inclusive and balanced environment.

1.3. Challenges for Green Transformation

Green transformation is an enormous undertaking which is confronted by many challenges. First and foremost, China has an unbalanced economic structure and is trapped in economic path dependencies. Although great progress has been made in readjusting China’s industrial system, its many resource-intensive and energy-intensive industries still account for a big share of the economy making change towards a green economy challenging. Although China is the world’s second largest economy, the quality and efficiency of economic growth is not high because of inefficient resource allocation, a low input-output rate, regional economic disparity, and weak market innovation capacity.

Second, green technological and management innovations and applications are important endogenous drivers of green growth for traditional industries as well as new green industries, but China’s green technology R&D investment is inadequate. There is a large gap with developed countries in terms of innovation in the areas of clean production, alternative energy sources, and environmental protection. For instance, in the wind energy industry, most of the high-end components are imported, and R&D and human resource capacities are fairly weak.

Third, governance institutions were designed at a time when the green transformation was not yet a priority. The monetary and fiscal policy systems do not promote green growth, and there is not an effective resource pricing mechanism. Existing policies and measures are scattered in departments dealing with sectoral development, reform, finance, environmental protection, forestry, and water conservation. Policies often overlap and sometimes even pursue conflicting objectives. There is no overall coordination mechanism to assure that green transformation and

ecological civilization objectives are given sufficient priority. In addition, strong institutional constraints exist and incentives are lacking. Under the evaluation and promotion system, local government officials focus on the pursuit of short-term goals rather than on green development strategies and policies set by the central government. Standards for assessing progress towards improved environmental quality, green transformation of industry, and broader ecological civilization objectives at different levels of government have not been set.

Fourth, green transformation requires the complementary participation of all societal actors: government, market players, and society. Green transformation is knowledge-intensive, yet the ability of the executive branch of government to make and enforce evidence-based policies is relatively weak. Government officials have not been trained in green transformation thinking and often lack adequate tools and resources to turn policies into practice. In terms of the market, there are few market signals or mechanisms in place to encourage green innovation. The pricing system and subsidies often support traditional, resource-intensive and polluting industries rather than more sustainable, green industries. Citizens and social organizations' ability and willingness to participate in the green transformation is growing, but the full potential of their contributions have yet to be realized. Enhancing capacity in a cost-efficient manner means mobilizing the potentials that exist in the market and in society to partner with the government in structural and market reform for an ecological civilization.

CHAPTER 2 GOVERNANCE CAPACITY: CONCEPT AND FRAMEWORK

2.1. The Concept of National Governance Capacity

A green transformation will need new ideas about governance, systemic reform of the national governance system and strengthening of governance capacity. President Xi Jinping explained his understanding of the national governance system and governance capacity in an article in *Qiushi*:

“China's national governance system can be understood as a full set of closely linked and coordinated national systems through which the country is governed under the leadership of the Party. It consists of institutions, mechanisms, laws, and regulations with regard to economy, politics, culture, society, ecological progress, and Party building. China's national governance capacity refers to our capacity to administer various social affairs through the application of national systems. This includes promoting reform, development, and stability, handling domestic affairs, foreign affairs, and national defense, and governing the Party, the state, and the armed forces. A country's national governance system and governance capacity complement one another to form an organic whole. We say this because a sound governance system is essential for the improvement of governance capacity, while the improvement of governance capacity is a necessary precondition for fully exerting the effectiveness of a governance system”.²

When discussing national governance capacity for green transformation, not only should the individual roles of the government, market and society be considered, but also the establishment of a long-term institutional system in which these three dimensions will be in close coordination and mutually supportive. In this way the governance system can provide a sound environment for effective policy implementation. The institutional system can act as a supporting framework and policies can serve as instruments for the continuous promotion of market, societal and governmental functions.

The Task Force's discussions about green transformation of national governance capacity have focused on these three dimensions. For the Task Force, national governance capacity includes the abilities of the government to build institutions, the

² Xi Jinping, Aligning Our Thinking with the Guiding Principles of the Third Plenary Session of the Eighteenth CPC Central Committee, *Qiushi*, January 2014.

executive branch of government to make and enforce rules, the market to internalize externalities, and the public and social organizations to participate in environmental protection.

In 2014, the Task Force, “*Institutional Innovation for Environmental Protection in the Context of Ecological Civilization*” of the China Council for International Cooperation on Environment and Development produced a detailed study of the environmental protection system. With this as background, the policy recommendations of this Task Force focus mainly on governance capacity, the promotion of governance capacity, and the reform of the governance system. While drafting policy recommendations, this Task Force gave full consideration to how to enhance national governance capacity to better promote the effectiveness of institutional reform for ecological civilization as called for in the *Integrated Reform Plan for Promoting Ecological Progress*.

2.2. The Framework for Improving National Governance Capacity

National governance capacity is often evaluated in terms of results, such as, the ability to collect taxes. Since the major objective of this Task Force is to put forward policy recommendations which can increase national governance capacity for green transformation, the governance capacities of the government, market, and society are explored and practical recommendations for enhancing national governance capacity are proposed.

Key factors which can influence the roles of government, market, and society in the green transformation are: a good institutional environment; a reasonable incentive system; adequate resources (human, financial, material, technological, informational, etc.) which correspond to responsibilities; and, the capabilities and environmental awareness of stakeholders (public officials, enterprises, the public, and organizations). Goals to be achieved by 2020 and for the following two five-year periods through 2030 linked to these four factors are proposed.

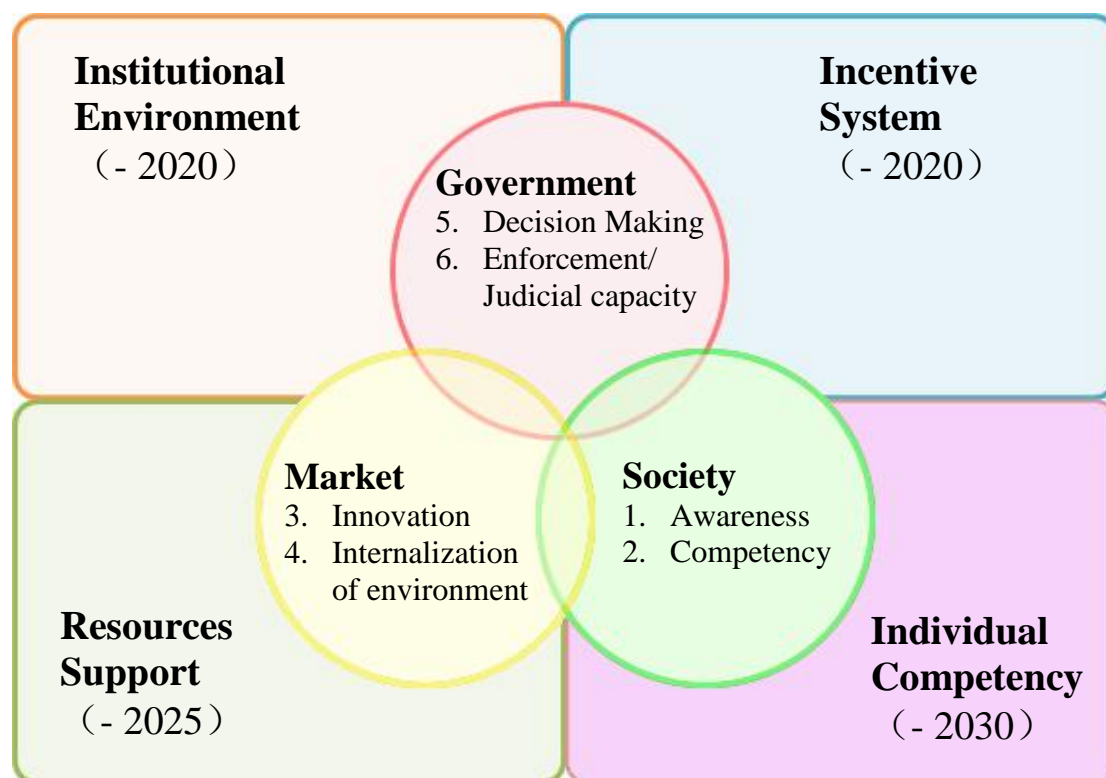


Figure 2-1 Framework for improving national governance capacity for green transformation

Establishing a good institutional environment and a reasonable incentive system through the reform of institutional mechanisms, laws and regulations can lead to results in implementation in the near future (2020). In the context of ecological civilization construction, China is rapidly advancing related institution building. The *Integrated Reform Plan for Promoting Ecological Progress* proposed reform goals to achieve by 2020. These goals are also addressed by the institutional environmental construction proposed by this Task Force.

It will take time to match resource needs with the responsibilities especially of the executive branch of government related to policy enforcement. First, identifying social management needs which are already undergoing dynamic changes as a result of the implementation of policies "to streamline administration and delegate power to lower levels" will be a complex task. Second, determining the resource requirements of public agencies in relation to their functions, institutions, and staff size will also be a complex undertaking. Finally, realizing a steady adjustment in the power, responsibilities, and resources of different agencies will be a gradual and time-consuming process. It can be expected that reallocating resources for the green transformation will achieve certain results by 2025.

Developing an appreciation of the concept and values of green development in all of society will be a long-term undertaking. It will require persistent education, training, and guidance throughout the entire educational system. Enhancing the capacities of the government officials and social organizations will require continuous training and learning. Improvements in individuals' abilities and environmental consciousness for green transformation will be a long-term process but results can be expected by 2030.

CHAPTER 3 DEFICIENCIES IN NATIONAL GOVERNANCE CAPACITY

In the national governance system, the roles of the government, market and society are dynamic and changing. In the era of the planned economy, the government played an absolute and dominant role. During the transformation to a market economy, the market began to play a more and more important role in national governance. With the enhancement of public participation and awareness, citizens and social organizations are playing a more important role in national governance than ever. One of the principles of reform called for in the *Integrated Reform Plan for Promoting Ecological Progress* was defined as “adhering to the correct direction of reform, perfecting market mechanisms, giving a better play to the leading and supervisory functions of the government, bringing the initiative and self-restraint of enterprises into play and giving free rein to participation and supervisory roles of social organizations and the public”. In this chapter, we will further discuss the status quo and capability challenges for green transformation governance.

3.1. The Capacity of the State to Make Policies

The United Nations Conference on the Human Environment held in 1972 brought impetus to the start of China’s contemporary environmental protection. At the Second National Environmental Protection Conference held in 1983, environmental protection policy was listed as one of the fundamental national policies of China. Afterwards, the central government enacted the *Environmental Protection Law*, *Water Pollution Prevention and Control Law* and the *Air Pollution Prevention and Control Law* and issued a series of policy documents, including *Action Plan on Prevention and Control of Air Pollution*, *Action Plan on Prevention and Control of Water Pollution* and the *Opinions on Accelerating the Ecological Civilization Construction*. In addition, China signed a number of international environmental conventions. The central government also issued related administrative rules and regulations, such as the *Regulation on Environmental Impact Assessment of Planning* and the *Regulations of the People’s Republic of China on Nature Reserves*. The competent authorities formulated nearly 200 department regulations and normative documents as well as a number of national environmental standards. In this way, China established an institutional system for pollution control and environmental protection guided by national framework policies; relying on laws, rules and regulations, standards and administrative orders; and laying an institutional foundation for green transformation.

Though China has made continuous efforts at perfecting its institutional system, the government is still notably weak in terms of its policy-making capabilities. There

are several specific weaknesses existing in relation to policy makers, policy texts and policy execution:

(I) Deficient professional knowledge and lack of information hinder scientific decision-making

Sound and scientific decision-making for green transformation involves sophisticated professional knowledge of environmental science and engineering, economics and public administration. Any public policy regarding green transformation must be based on the analysis of modern environmental science and engineering, economic cost-benefit analysis and regulatory impact assessments. Unscientific and random decision-making not only causes immense waste of public resources but also causes more environmental problems. China must solve the conflicts between economic development and environmental protection and promote green transformation of economic and social development in a scientific manner. The Chinese government's legislation and decision-making for the green transformation must also be based on comprehensive scientific analysis.

Legislation by departments has long been the case in China and is an inertia in the current system. Specialty laws such as those on environmental protection are generally drafted first by the relevant governing ministry, submitted to the Legal Office of the State Council for review and circulated in other related ministries for comment. Once a bill is reviewed and approved in principle by the State Council, it will be submitted to the National People's Congress (NPC). Bills are reviewed by the relevant committee of the NPC and technically reviewed by the Commission of Legislative Affairs, Standing Committee of the NPC before being submitted to the NPC and its Standing Committee for voting. Members of the NPC and its Standing Committee, are primarily promoted from departments and local governments, who generally lack knowledge relevant for the green transformation. Of the 32 members of the NPC Environment Protection and Resource Conservation Committee, very few have a professional background or work experience in environmental protection. For this reason, it is difficult for them to voice any professional opinion on green transformation questions.

In the existing legislative and decision-making systems, though scientists are personally engaged in consultation, there is no mechanism for a comprehensive responsible expert committee to convey professional and collective opinions based on in-depth systematic analysis of related major decisions and legislation. As a result, legislation becomes the conveyor belt of the interests of government departments

rather than the reflection of comprehensive and scientific analysis.

Meanwhile, incomplete data collection and sharing result in deficiencies in obtaining the kind of comprehensive information needed for institutional improvement and policy-making. The ecological environmental monitoring network is incomplete in terms of its scope and coverage. There are inconsistencies in construction planning, standards and specifications and information distribution. There is a low level of IT application and information sharing, and the connection between monitoring and supervision is loose. There is room for further improvement in the quality of monitoring data. It is becoming clear that this system is failing to meet the demands of ecological civilization construction and compromises the scientific basis and authoritativeness of the monitoring system and public trust in the government. Moreover, some local governments, driven by economic growth, tend to conceal relevant information, which also compromises the abilities and awareness of decision makers in evidence-based decision-making.

(II) Principle-based regulations do not guarantee the orderly participation of multiple stakeholders

Pluralistic participation entails being open to the public about the strategies to be used in implementation, and allowing the public to raise questions, to be involved in discussions and to make suggestions in decision making processes, thereby ultimately influencing outcomes. There are a lot of references to pluralism in Chinese laws and regulations. For example, as specified in Article 5 of the *Environmental Protection Law*: “Activities concerning environmental protection shall adhere to the following principles: according priority to protection, emphasis on prevention, integrated governance, public participation and liability assumption of damages.” As specified in Article 14, relevant departments of the State Council and the governments of provinces, autonomous regions and municipalities directly under the Central government should fully take environmental impacts into consideration when formulating economic and technical policies and solicit the views of stakeholders and experts. These are basic provisions of the *Environmental Protection Law* in relation to stakeholder participation.

In addition, the *Environmental Impact Assessment Law* and the *Air Pollution Prevention Law* share the same principles. Nevertheless, although the principles in existing laws and regulations are sufficient, details are inadequate. The system lacks a means to secure pluralistic participation and specific rules on participation in the preparation of regulations. Furthermore, over use of vague words, like “should” and

“encouraging” decreases the authority and efficiency of relevant legal provisions. For example, public participation in construction programs are held mainly by construction units; associates or supporters of the construction units tend to participate in the so-called verification meetings and hearings. There is a lack of specific methods and procedures, so that the significance of such hearing and meetings are greatly reduced.

3.2. The Capacity of the Government to Enforce Policies

Starting in the 1970s, China gradually established a top-down natural resources and ecological environmental protection management system. There are ten departments with functions related to protecting resources and ecological and environmental systems, including development and reform, environment protection, land resources, agriculture, water resources, housing and urban-rural development, transport, industry and information technology, forestry, and ocean departments. After several adjustments, gradually the system for management of natural resources and the ecological environment is moving towards a system of uniform supervision and management, differentiated responsibility and horizontal coordination. This system plays an important role in the implementation of strategies governing China’s natural resource use and ecological environmental protection, but there are shortcomings in relation to the following aspects:

(I) The current horizontal and vertical institutional arrangement for environmental protection restricts the roles the environmental administrative agencies can play.

Green transformation is a systematic project, requiring cooperation and coordination among a number of administrative departments engaged in environmental protection as well as at the central and local levels. As explicitly stipulated in the *Environmental Protection Law of the People’s Republic of China* Article 13, “The content of environmental planning should include ecological protection and pollution prevention goals, tasks, safeguard measures, and there should be a convergence in the main functional areas of planning, land use planning and urban and rural areas planning.” However, administrative fragmentation, and functional overlaps result in a situation in which the formulation and implementation of environmental protection plans, laws and regulations fails to penetrate into other relevant departments. As a result, the environmental protection system is not currently capable of adequately fulfilling its responsibility for promoting ecological protection and green production and life.

Among the 53 main ecological environmental functions at the national level, 21 are in the Ministry of Environmental Protection, while 32 are dispersed in nine other departments. Of the 21 functions for which the Ministry of Environmental Protection bears the main responsibility, almost half overlap with responsibilities found in other departments.³ Although local environmental protection departments are nominally subordinate to the Ministry of Environmental Protection, they are in fact guided and controlled by their local governments. Under this system, local environmental protection departments inevitably compete for the same budgetary resources with other peer governmental departments. Due to the primacy placed on economic development by local governmental officials, the environmental supervision of enterprises is seldom considered. Therefore, local environmental protection departments fail to get the resources necessary for environmental protection, leading to problems with environmental regulatory enforcements.

Within environmental protection departments, the resources of law enforcement agencies do not match their responsibilities, resulting in fatigue and frustration among law enforcement personnel. For example, when for a long period there is no joint law enforcement between the environmental protection departments and agencies of the national and provincial levels and public security departments, a “vacuum” can easily appear in the coordination between the two functional departments. Local public security departments often shirk their functional responsibility with the excuse that there is lack of clarity regarding enforcement of motor vehicle pollution by superiors. The environmental protection departments do not have independent inspection authority over motor vehicle emissions. These factors lead to failures in implementation of road inspection work.⁴ As the lead responsible unit of motor vehicle pollution prevention, the liability of the environmental protection bureau does not match with the resources it has at its disposal, which hinders the carrying out of relevant work.

And compared with administrative punishment measures, the effect of criminal law on environmental protection enforcement in China is still limited and will be so for a long time. In cases of alleged environmental criminal activity, the filing requirements and standards in the *Code of Criminal Procedure*, lack practical operability affecting the detection and filing of suspected environment criminal cases.

³ Wu Shunze, Eight Challenges for Environmental Protection during the “13th Five-year Plan” Period [J]. China Environment News. 2015: 9-25.

⁴Li Gang, Luo Wei, Xu Weibin, Xu Kngyu, Discussion on Innovation in Vehicle Exhaust Control Policies, *Environment and Life*, 2014.

(II) Inadequate consideration of environmental performance in the promotion system affects the attention governmental officials give to environmental protection

Currently, political incentive systems for ecological civilization and environmental protection are driven by negative incentives. There is much less use of positive incentives. The accountability system for officials is maturing, but accountability is often still based on negative incentives or disciplinary measures for those failing to strictly implement the corresponding strategy. In the performance indicators used in the appraisal of cadres, beneficial indicators for cadres that positively perform the functions of environmental protection are lacking. The lack of positive incentives directly ties into the limited movement and promotion opportunities for officials.⁵ Although the central government is putting emphasis on environmental indicators in the cadre appraisal system, it is difficult to completely change the conflict between environmental indicators and other mandatory economic development indicators in a short period of time. Local cadres tend to resist or employ flexible strategies rather than implementing the central policy of ecological environmental protection efficiently and loyally.

(III) Regulatory power does not match with resources granted to regulatory agencies at all levels

Environmental monitoring is a precondition to environment regulations, environmental risk prevention and the green transformation. Prior to 2003, the State Environmental Protection Agency was responsible for environmental monitoring and assuring that pollution standards were met. However, with the significant expansion of the scale of national industrial production, even though the concentration of pollutants released by specific industries may have met standards, total ambient pollution discharges were often very high resulting in serious degradation of environmental quality. Since 2003, the State Environmental Protection Administration (now, Ministry of Environmental Protection) requires local environmental protection departments to calculate total allowable emission levels for air and water within respective jurisdictions and then based on this to adjust permissible discharge levels for each pollution source.

Because of limited resources, the environmental protection departments usually

⁵Kostka G. Environmental protection bureau leadership at the provincial level in China: examining diverging career backgrounds and appointment patterns [J]. *Journal of Environmental Policy & Planning*, 2013, 15(1): 41-63.

focus their attention on large-scale pollution sources; however, although their total pollution discharges may be very large, most SMEs, and especially those in rural areas, tend not to be monitored. In addition, the fixed investments for constructing environmental monitoring stations falls on the environmental protection departments while operating costs are borne by the local government. This is a heavy burden for economically less-developed areas. Especially after the promulgation of new air quality standards in 2012, existing monitoring equipment is inadequate to fulfill monitoring requirements. A major challenge in constructing the national air environmental quality monitoring network will be finding ways to assure there are sufficient resources.

(IV) The competencies and awareness of civil servants related to green transformation need to be improved

The green transformation is a knowledge-intensive undertaking; policies to promote the green transformation touch on many fields, including green investment, green trade, green consumption, green fiscal policy, green taxes, green finances, green industrial policy, and policies for greening the economy, as well as other policies to guide the social and environment fields.⁶ This will require that civil servants have relevant knowledge to pursue this green transformation. In addition, the green transformation puts expectations and constraints on civil servants,⁷ including in terms of improving service quality, improving work efficiency, reducing administrative costs and eliminating office waste. Accordingly, the cognitive skills and attitudes and the education and business skills for the green transformation of civil servants needs to be improved.

3.3. The Capacity of the Market to Internalize Externalities

Although the effort of the whole society is required for the green transformation, enterprises will be crucial to the green transformation. The discussion of the governance capacity of the green transformation is actually a discussion of the capacities of enterprises, the main actors in the market, to green their businesses. The basic goal of participants in the market is to obtain economic benefits. Unless there is a benefit or a regulatory requirement, the market participant will not invest in green innovation or reduce environmental pollution. Therefore, government and industry

⁶ Yu Hai, World and China under New Trend of Green Transformation, People's Forum Academic Front, 2015(01): Page 53-63.

⁷ Hu Yuemin & Liu Jiaku, Green Development Transformation: Literature Search and Theoretical Analysis, Modern Economic Research, 2013(06): Page 33-42.

associations have to create an institutional environment that will be conducive to promoting green innovation and internalizing environmental externalities. In other words, companies' green transformation will require their own efforts as well as positive action on the part of the government in terms of providing a favorable market environment for green businesses, and through establishing various incentives and constraints on business behavior, including fiscal and taxation policies and standards. China still has many deficiencies in these areas:

(I) Price reform of important resources is still lagging behind; the government's economic incentive policies for the green transformation of enterprises through finance, taxation, standard setting, and the like are not without flaw.

The government intervenes in the setting of prices for coal, oil, natural gas and other key resources, so prices do not reflect the scarcity of resources, resulting in excessive consumption of resources and their exhaustive exploitation. Resource taxes are low and do not reflect the costs of resource destruction and environmental governance. The ecological damage caused by resource extraction and use cannot be sufficiently compensated, resulting in environmental destruction.

There is a lack of existing measures available to the government to use to provide economic incentives to enterprises, such as financial and taxation policies or standards. The government should improve its approaches to and efficiency in providing financial support to R&D and the promotion of green technology applications. The standards of some major sectors are still inadequate. The progress in developing platforms for the cooperation among government, enterprises, universities and research institutes on innovation and for the promotion of green technology and business models is slow.

Green supply chain standards and the green standard certification are imperfect and inconsistent, leading to high implementation costs for green supply chains. While multinational enterprises are leading in the development of green standards, the degree of participation in green procurement, marketing, production and other aspects of the standard setting process by government agencies, industry associations, enterprise unions and middle and SMEs is quite low. Due to insufficient cooperation, there is a lack of uniformity in the green standard certification systems established by different industries and leading companies.

(II) Enterprises have difficulty in translating reputation in environmental protection into real economic benefits. The market for environmental industry is

still not mature, so the market fails to play a decisive role in the allocation of resources or to provide positive incentives for green development by enterprises.

The existence of a green consumer market is a prerequisite for enterprises to become engaged in the production and provision of green products. The Chinese green consumer market is still lagging behind, a system is required to promote the development of green market and raise awareness of green products and their consumption needs to be increased. The tax and subsidy policies which could contribute to green consumption are imperfect, and a price system mechanism to promote green consumption has not been established. In addition, the corresponding marketing and distribution systems have not been formed, which makes it difficult to translate the reputation, trust and other social capital firms may have in the field of environmental protection into real economic benefits.

There is shortage of government capacity to create a market environment that is open, fair and conducive to new emerging industries. There is still some direct governmental interference in micro-level economic activities. In some fields, enterprises of different ownership types are treated unequally. Problems of administrative monopolies are still prominent, and there are still institutional barriers facing enterprises (especially those in the private sector) wishing to access some key fields. There are problems of local protectionism, and a unified nationwide market has yet to be formed. The current market regulatory approaches are not compatible with the demands of new economic models and new industries.

(III) The governmental capacity for supporting green innovation and green practice is inadequate.

In the past few years, a diversified network platform was established by the government, industry associations and enterprises and a green standard certification and enterprise environmental information database was established, expanding the avenues for participation in the governance for a green transformation by various market actors. For example, the first comprehensive service platform for the marketization of green supply chain management of China (Tianjin Green Supply Chain Service Center), established by American Sustainability Consortium, China Environmental United Certification Center Co., Ltd. and Tianjin Government, promoted the localized application of the American green supply chain management system.

However, the resource integration of the green platform is quite weak. The green technology platform, green supply chain centers and enterprise environmental

information platforms are dispersed; the links between the various types of network platforms, the sharing among them and their openness is inadequate, which limits the integration and sharing of green resources, technology, products and supply chain management services. There is limited enthusiasm or willingness of enterprises to proactively participate and thus, corporate environmental information is not comprehensive, but rather imprecise and opaque.

(IV) Many small- and medium-sized enterprises (SMEs) do not participate in the green supply chain system. The concept of green development is not well understood, nor is the idea of a green supply chain well appreciated. The overall sense of social responsibility for the environment is inadequate.

The understanding of green transformation governance is lagging in many enterprises, especially heavily polluting industries. There is a certain misperception in these enterprises' understanding of green technology and green supply chain, and appreciation of corporate social responsibility for environmental protection is weak. For example, the Zijin Mining Industry Co., Ltd.'s problematic understanding of the green development concept resulted in its indifference towards environmental protection, and this resulted in many serious environmental pollution events.

The green supply chain has been strictly implemented in some fields. Under the impetus of multinational companies like IKEA, Wal-Mart, Epson, Apple Inc., and other representative enterprises in the automobile, electronics, and chemical industries, green supply chains have been strictly implemented and enforced. The supply chain governance model has matured. There is now joint participation by government departments, buyers, and consumers, and the system now functions well. For example, as required by the Ministry of Industry and Information Technology, Huawei established a three-way cycle sharing model with China Mobile and Chinapack Jingli Company. In 2011, the total delivery quantity of green packaging of Huawei reached 47,600 pieces, which reduced the demand for forest wood by about 5300 cubic meters. Carbon dioxide emission reductions amounted to 13,000 tons. The green package application ratio for major devices reached 79%, and the resource recovery rate reached 85.8%. Under the promotion of multinational companies, since 2005, representative domestic enterprises like Baosteel, Skyworth, SGM, etc., have started to promote green supply chains.

However, the ability of SMEs to participate in the green supply chain is low. Many SMEs face restrictions like financial constraints, inter-firm trust, technical knowledge, environmental standards and the tax system, and as a result, they do not

participate in green supply chains. For example, the *China Green Supply Chain Survey Report* issued jointly by GXS and the Global Supply Chain Council in 2010 indicated that 36% of the respondents thought that the biggest obstacle for the implementation of the green supply chain management was the high cost.

3.4. The Capacity of the Civil Society to Participate in Green Transformation

In 1994, the State Council issued *China's Agenda 21—White Paper for Population, Environment and Development of China in the 21st Century*, stating that “to achieve the sustainable development goal, we must rely on the support and participation of the public and social organizations, including workers, farmers, women, the youth, technology and education fields.” This was also the first time that the government of China defined a path and policies for public participation in environmental protection in a programmatic document. Since then, great progress has been made in laws, regulations and policies for social organizations, but there are still many challenges facing the public and social organizations in terms of their participation in environmental protection. Social governance capacity is still weak, which mainly is reflected in the following ways:

(I) There is still a shortage of laws and regulations facilitating the participation of the public in environmental protection; the overall political environment for the development of social organizations related to environmental protection needs to be improved. The rights and responsibilities of the public to the environment require clarification.

In order to promote public and environmental social organization participation in environmental protection, the government issued a series of policies. For example, in 1996, the State Bureau of Environmental Protection, the Propaganda Department of CCCPC, and the State Education Commission issued the *Outline of National Actions on Environmental Publicity and Education*; in 2006, to promote and legislate public participation in environmental impact assessment activities, the State Environmental Protection Agency established the *Interim Measures on Public Participation in Environmental Impact Assessment*; in 2011, the Ministry of Environmental Protection issued the *Guidelines on Cultivation and Guiding Orderly Development of Environmental NGOs*; in 2014, the Ministry of Environmental Protection issued the *Guidance on Promoting Public Participation in Environmental Protection, Opinions on Strengthening Work of Environmental Information Disclosure and Media Guidance* and the “*Breathe Together & Work Together*” *Citizen Code of Conduct*; and in 2015, to strengthen the degree of participation by the public, the Ministry of Environmental

Protection issued the *Measures for Public Participation in Environmental Protection*.

Still, although there are many laws and regulations associated with the participation of the public in environmental protection, these laws and regulations are fragmented, their legal force is low, and they are weak in terms of their ability to constrain behaviors. The existing laws and regulations lack a clear definition on rights and obligations of the public to participate in environmental protection. Environmental law enforcement, moreover, is often not practiced. The *Guidelines on Cultivation and Guiding Orderly Development of Environmental NGOs* issued by the Ministry of Environmental Protection has not been well implemented since it was issued. Its legal hierarchy is low and its constraining force is limited. Moreover, there is no special institution, personnel nor budget in local environmental protection departments to implement the policy.

In addition, environmental social organizations still face some bottlenecks in relation to registration, fund-raising qualifications, environmental information acquisition, channels for institutionalized participation in environmental protection, etc., and the cultivation and supervision policies of environmental social organizations still needs to be further improved.

(II) The public and social organizations lack necessary information for participating in environmental protection; and the environmental departments lack budget for full-time staff to perform the work involved in supporting public and social organization participation

Environmental information is the basis for public and social organization participation in environmental protection. However, information related to environmental protection is scattered because of the absence of a unified information disclosure platform. The participation of the public and the social organization is restricted. According to the provisions of the recently issued *Measures for the Disclosure of Environmental Information by Enterprises and Public Institutions*, enterprises and institutions shall conform to the principles of both mandatory disclosure and voluntary disclosure. This “voluntarily encouraged” policy-oriented legislation method does not specify the obligations of polluting enterprises to disclose environmental information, nor does it specify the legal sanctions for enterprises violating the disclosure obligation, nor does it set measures to encourage enterprises to actively provide relevant information. Under these circumstances, it is very difficult for the public to obtain environmental information about enterprises.

To promote public participation and improve social governance capacity, the

Propaganda and Education Department of the Ministry of Environmental Protection strengthened the basic responsibility to “centralize the environmental protection business training for social public participation, and promote public and social organization participation in environmental protection.”⁸ This means that the government will have a special functional department that is responsible for governing social work for environmental protection. In addition, the Ministry of Environmental Protection has set up the Publicity and Education Centre which is a “technical support unit that conducts publicity and education as well as capacity training for various industries,” engages in environmental publicity and training projects, drives the local environmental protection propaganda and education centre network to jointly improve environmental awareness of various social industries, and promotes public participation in environmental protection. The environmental protection departments of various regions also established corresponding institutions. Though the Ministry of Environmental Protection has specified the Propaganda and Education Department to be responsible for public participation, there is no special office responsible for relevant work. The Propaganda and Education Department is still mainly involved in traditional environmental protection publicity and education work. The effort put into promoting public and social organization participation in environmental protection is relatively limited. In addition, local environmental departments lack special personnel and budget for supporting public and the social organization participation.

(III) The public still lacks the knowledge and skills required for participating in environmental protection. Environmental protection social organizations still face such problems as small size, inadequate funds, and lack of skilled individuals.

Environmental protection departments, the media and relevant departments at all levels have been engaged to a certain extent in publicity and education for environmental protection and green culture in schools, communities and enterprises to advocate green civilization, and in this way were heightening environmental awareness among the public. Currently, the Chinese public is environmentally aware but often does not take relevant actions. Research shows that whereas only 36% of the respondents in China agreed to develop a green GDP in 1998, that rate increased to 80% in 2008. In 1998, 56.7% of the public felt that environmental pollution was "quite severe" or "very severe". In 2008, that rate increased to 76.4%. However,

⁸ See the website of Ministry of Environmental Protection: <http://xjs.mep.gov.cn/>.

although the public's environmental awareness has strengthened, some research shows that the public still rarely takes environmental protection actions, and does not adopt environmental protection behaviors. Only 26% of the public claim that they "often take environmental protection and energy saving behaviors." While 62.6% of the public occasionally attend environmental protection related activities, up to 30% of the public say they have never attended any such activities.

Although the nation has invested enormous manpower and materials in promotion and education for environmental protection, and citizens are increasingly more environmentally aware, the public still has insufficient knowledge about environmental science and lacks environmental protection skills. According to the research of Shanghai Jiaotong University in 2015, only 43.2% of respondents claim that they understand PM2.5, more or less the same rate as two years earlier.⁹ In another study, 66.3%, 56.9%, 45.5%, 41.4%, and 27.8% of the interviewees heard of "trash classification", "white pollution", "the three wastes (waste air, waste water, and waste solid) in environmental pollution", "greenhouse gases", and "biodiversity", respectively. This reflects that the level of environmental knowledge is quite low, as is the public's skills and abilities in engaging in environmental protection.

China started late and has a poor basis for social environmental organizations. The first environmental social organization, China Society of Environmental Sciences, was established in 1978. To date, the number of environmental social organizations in China is less than 8,000 in total, and the number of persons joining in social environmental organizations was less than 0.06 in 10,000. In addition, most social environmental organizations are small with poor expertise and capacity. According to research conducted in 2013, 22% of the social environmental organizations in China have no full-time staff, 59% have 1 to 9 full-time staff, and only 2.6% have more than 35 full-time staff.¹⁰ Besides the small scale of personnel, environmental social organizations in China suffer from inadequate funding. According to a survey, 14.5% of the organizations do not have any revenue, 50% of the organizations have an annual revenue of 500,000 Chinese Yuan and above, and only 8.6% of the organizations have a revenue of 10 million Chinese Yuan and above. According to a survey conducted by the All-China Environment Federation, only

⁹ SJTU Center for Public Opinion Research, Research on Environmental Awareness of Chinese Urban Residents in 2015
<http://www.aiweibang.com/yuedu/40875259.html>.

¹⁰ Deng Guosheng, Zhao Rui, and Zhao Ying, Research Report on Status of Social Environmental Organizations in China, NGO Research Institute, School of Public Policy and Management, Tsinghua University, 2013.

55.2% of the environmental social organizations have their own offices, 55.2% of the environmental social organizations have a website, and 76.8% of the environmental social organizations have designated email addresses. In terms of international experiences and trends, social enterprises and energy-related cooperatives as distinct from social environmental organizations are also playing an increasingly significant role and making continuous innovations in green transformation. However, social enterprises, energy and organic agriculture cooperatives in China are in an early stage of development. Their social vitality has yet to be awakened.

CHAPTER 4 POLICY RECOMMENDATIONS

To achieve the goals of green transformation, China needs to reengineer its national governance system and improve its national governance capacity. In *the Integrated Reform Plan for Promoting Ecological Progress*, China lays out the institutional reforms needed to realize green transformation. Green transformation requires the involvement of the whole society and there is a high degree of consensus of the whole society on the necessity of green transformation, which makes national governance capacity building for green transformation an ideal experimental field for a comprehensive reform on improving overall national governance capacity. National governance capacity is critical in building institutions and making the institutions work. Significant capacity enhancement is required by government, the market, and the civil society in green transformation as follows:

4.1. Enhance State Capacity to Make Policies

Overall objective: Enhance state capacity for making policies in a scientific and democratic way by using scientific analysis to inform policy making and enabling stakeholders to participate in the policy making process and in forging consensus.

(I) The government should establish a guaranteed legal rights to, and ways for pluralistic participation in the formulation of laws, regulations and policies.

Change is required to current arrangements where policies and planning are mainly proposed and even made by administrative agencies. Key decisions which may incur a significant potential impact on the environment should be jointly made by the higher level comprehensive organization, including inputs from the department of environmental protection, expert advisory and social groups. This is to be done to eliminate department interest-based policy-making and to avoid new conflicts erupting with other policies where departments design and decide their main policy areas and plans by themselves. The rights to, and ways for participation should be institutionalized.

In making laws, regulations and policies for a green transformation, the responsibilities of various committees and the mechanisms governing their establishment and abolition need to be clarified. The Federal Advisory Committee Act of the United States highlights good practice. Opportunities to enable public participation need to be embedded into key legislative instruments and policy development relating to the green transformation and need to be mandatory. Information disclosure is a basic premise for broad participation in the green

transformation and should be guaranteed. Opportunities for stakeholder and broader public input need to be broadened by the state and include mechanisms to provide feedback.

(II) The State Council should set regulations to promote evidence-based policy making, and enhance the transparency of policy making to improve decision quality.

Green transformation is an enormous undertaking. Institution building and policy making for green transformation needs to be evidence-based. The Task Force recommends that the transparency of policy making be enhanced and the procedures for justifying policies be improved. To promote public participation in policy making, there are multiple approaches which can be adopted, including but not limited to: (1) openly soliciting policy issues from the public, (2) selecting public representatives via internet, (3) communicating with the public through emails, (4) making public the policy making process through live broadcast, and (5) conducting on-the-spot dialogue.

Making transparent how the government makes policies on green transformation and allowing for extensive democratic participation can build a pattern of “open policy making”. The principle of sustainable development should underpin key economic, social and departmental policies as well as policies on technical innovation, and evaluation and adjustment processes. Strengthening cost-effectiveness analyses tied to policy making can prevent excessive gaps between policy goals and outcomes.

(III) Train policy makers on how to make evidence-based policies, innovate ways to train and educate individuals to be qualified to support the legislature on green transformation issues

First, a mechanism should be set up to improve training relevant to the green transformation. Consideration could be given to establishing legislative training agencies jointly run by the National People’s Congress (NPC) and academic institutions specialized in legal sciences and which can offer courses on the state of knowledge, potential and methods of green transformation and develop systematic and thorough conventional training programs.

Second, means for recruiting skilled individuals should be improved. It is proposed this include an increase to the number of staff supporting NPC legislative efforts as this is urgently needed for the green transformation of society.

Third, a means for enhancing the sharing of information and exchange among relevant actors should be developed which can stimulate communication between the legislators of the NPC, administrative organs, judicial agencies, law firms, institutions of higher learning and scientific research institutions on experiences related to the country's governance capacity for the green transformation.

Fourth, a high quality talent cultivation system should be established. It is recommended that this include programs for training of legislative talent in institutions of higher learning, the accelerated establishment of high-caliber policy and law and other related disciplines in universities and colleges and permitting qualified institutions of higher learning to award master's and doctoral degrees in policy and legal science.

Fifth, corresponding supporting mechanisms should be established. A series of measures should be provided to help guarantee that NPC representatives and legislators can perform their duties, for instance, by increasing their basic material benefits and improving their working conditions.

4.2. Enhance Governmental Capacity to Enforce Policies

Overall objective: Enhance the capacity of the executive branch of government to implement policies and the judiciary to adjudicate.

(I) Establish the legal foundations for green transformation.

First, it is advised that the CPC Central Committee and the State Council formulate a "Guidance for Expediting Green Development" at the state level; make comprehensive plans for low-carbon and circular-economy development; implement a uniform and comprehensive system and policy incentives for green development under the framework of ecological civilization construction; pinpoint the obligations and responsibilities of the government, the enterprises and other parties concerned, underscore the leading role of the government in green transformation and development; and establish comprehensive coordination mechanisms at the state level for green development.

Second, the *Circular Economy Promotion Law* should be amended in accordance with new domestic and international trends in circular-economy development and taking into account the implementation challenges of the present law. Conservation, recycling and the comprehensive utilization of resources should be effectively promoted. It is also recommended to set efficiency and total resource consumption

targets, steadily boost the efficiency of resource utilization, build a circular society, explore institutional arrangements to control total resource consumption, step up the formulation of supportive regulations and standards for the circular economy, and develop a comprehensive set of legal and regulatory policies and standards.

Third, a *Law to Tackle Climate Change for Low-Carbon Development* should be drawn up. To achieve the overall objective of peaking carbon emissions by 2030 or earlier if possible, it is strongly advised to formulate an institutional system focusing on total carbon emission control and emission permits, establish and improve systems for climate change mitigation and adaptation; define the responsibilities of all parties for carbon emission reductions and make explicit laws and regulations for the calculation and monitoring of carbon emissions, allocation of carbon emission reduction targets, carbon assets management and carbon emissions trading, the incentive mechanisms for low-carbon development and consumption, as well as public participation and international cooperation.

Fourth, a carbon tax should be considered during the drafting of the *Environmental Protection Tax Law*. It is strongly advised to deepen tax reform, promote a fiscally neutral green taxation structure and expedite the consultation process tied to the drafting of the *Environmental Protection Tax Law*. The principle of “taxation by law” as stipulated by law should be followed and the NPC should legislate on the collection of environmental taxes. This is a good use of legislative resources. Considering the complexity of establishing the carbon market and the shortage of effective market measures for carbon emission reductions, it is recommended that consideration be given to adding a carbon tax under the *Tax Law for Environmental Protection*. The carbon tax could at first apply a low tax rate during its initial startup stage, adopting differential tax rates for different industries and then with time make gradual adjustment according to developments.

Fifth, reinforce implementation and inspection systems, increase the costs of violating the law and practically safeguard the fairness and dignity of the law. It is appropriate to make reasonable use of judicial resources to promote green transformation and green development, and to enhance the position of regulatory authorities and their capacity to enforce laws. This should include making information accessible to the public and making transparent the implementation of laws while enhancing public participation mechanisms to encourage people to abide by the law rather than relying solely on enforcement efforts. Laws should however be strictly enforced and violators should be brought to justice.

(II) Strengthen the coordination between departments responsible for different national policies.

First, conduct a systematic evaluation of departmental policies, macroeconomic policies, and environmental protection policies from the perspective of the sustainable development of the state. This should be done to minimize policy inconsistency, enhance policy conformity and give full scope to the functions of policy tools.

Second, create, optimize and develop the current environmental policy system, modify and remedy the shortcomings of present policies, devote positive efforts to researching, developing, formulating and supplementing new policy means for environmental protection, especially the making and issuing of relevant environmental policies focused on consumption and encouraging and guiding green and sustainable consumption by eliminating or lessening the conflicts of current policy measures.

Third, present laws and regulations shall be systematically rationalized and evaluated, the conflicts between different laws and between laws and regulations should be addressed to enhance complementarities. Coordination between laws and regulations should be improved to lower the costs, boost the efficiency, and improve the quality of the legal system. The adaptability of laws should be encouraged.

Fourth, inappropriate articles of law should be amended and the articles of law concerning guiding principles should be further elaborated and supplemented for the purpose of reinforcing the operability and enforceability of laws. Laws or articles of laws relating to sustainable development shall be added or supplemented in an effort to clear the gaps between laws or between laws and regulations and boost the completeness and interconnectivity of the legal system.

(III) Implement legislative and administrative reforms to realize a sound horizontal and vertical division between rights and obligations and bring into alignment the rights, responsibilities and abilities of departments.

First, establish a comprehensive coordination mechanism for green development and an Interdepartmental Leading Group for Green Transformation and Green Development. Transform the currently fragmented, independent, and closed decision-making system. Attach priorities to constructing and improving the division of labor among departments, trans-departmental coordination, and comprehensive decision making on environment and development.

Second, switch from top-down management to a combined top-down and bottom-up management approach or alternatively integrate an interactive top-down and bottom-up management approach. There are various constraints to the promotion of green transformation resulting from local development and socio-economic and environmental conditions. Local exploratory approaches are of vital significance and need to be popularized through experiences accumulated in local pilot units. It is advised to change the dominant management patterns employed by governmental departments, encourage exchange platforms and cooperation mechanisms for mutual learning, and allow for monitoring by the government, enterprises and the public.

Third, it is strongly recommended that the functions of the government for green transformation be adjusted when the government opens the opportunity window. One department should be assigned the responsibility to make overall plans and policies and having supervisory functions tied to the green transformation. It should focus on linking the energy structure transition, energy conservation and carbon emission reductions, circular-economy development, and other related issues in all social and economic development processes. Meanwhile, an International Development Agency needs to be founded. It is quite important to establish an independent International Development Agency to share the experiences from development and to take on the responsibility of a great power. The agency can unify the aid functions of different governmental departments and develop a plan for foreign aid for development, and improve the implementation of the “Going-out” strategy and the “One Belt and One Road” initiative for green development.

Fourth, reform the present environmental protection management system, rationalize the relationship between the central government and the local authorities and solve inter-district environmental problems. The dispersed functions of water conservation, environmental protection, housing and construction as well as land and resources relating to pollution control should be consolidated in one ministry, which should be in charge of pollution control and environmental regulation. It should have branch offices in local areas and basin regions which will be authorized to supervise and handle regional and basin wide environmental problems which cut across administrative regions. This Leading Ministry with its branch offices would then vertically control the environmental departments that are below the level of provinces, municipalities directly under the central government and autonomous regions. Environmental protection agencies below the county level would be dissolved.

(IV) The government should add the fulfillment of duties for green transformation to the various appraisal systems for officials.

It is strongly recommended to speed up the implementation of the *Methods of Investigating of Responsibility and Accountability of Leaders of CPC and Governments for Eco-environment Damages* to take into account the lifelong responsibilities of party leaders and government executives for eco-environmental damages and to establish a green governance system based on “dual responsibility”, namely the responsibilities of both the party leaders and government executives concerned.

First, it is advised that the State Council department in charge of eco-environmental protection and resource management formulate detailed work rules regarding responsibilities for eco-environmental damages in line with the *Methods of Investigating of Responsibility and Accountability of Leaders of CPC and Governments for Eco-environment Damages* and practical experiences of local areas. It is also highly recommended to implement procedures for investigating the responsibilities of related departments, and establish systems to investigate responsibilities for eco-environmental damages in a scientific, fair and transparent way.

Second, based on the principle of equal responsibility of both party leaders and government executives, it is generally advised to connect the implementation of the *Methods of Investigating of Responsibility and Accountability of Leaders of CPC and Governments for Eco-environment Damages*, the newly released *Regulations on Inspection Teams of the Communist Party of China*, the plans for auditing of outgoing leading officials’ natural resources/assets accountability, the *Scheme for Environmental Protection and Supervision* and the communication and accountability systems for environmental protection in order to support institutional innovation.

Third, it is advised to select some prominent problems and serious cases arising in eco-civilization construction and environmental protection to pilot investigations for responsibility for eco-environmental damages at different levels, for different targets and of different types, and based on accumulated experiences to further improve the *Methods of Investigating of Responsibility and Accountability of Leaders of CPC and Governments for Eco-environment Damages*.

Fourth, it is advised to establish an eco-environmental damage liability investigation system, which gives full scope to the functions of the judiciary, provides a role for social organizations, and takes into the scope of investigation prominent problems discovered in investigations of related cases, as well as those identified by the public or stipulated in the *Methods of Investigating of Responsibility and*

Accountability of Leaders of CPC and Governments for Eco-environment Damages.

Fifth, it is advised to integrate the essence and regulations of the *Methods of Investigating of Responsibility and Accountability of Leaders of CPC and Governments for Eco-environment Damages* into the amendments of the *Atmospheric Pollution Prevention Law* and of the *Water Pollution Prevention Law*. Provisions shall be incorporated into specific laws and regulations first, then the amendment of the *Environmental Protection Law* and other laws can be implemented to upgrade the party's policies.

(V) Training should be provided to public servants on knowledge relevant to green transformation.

Set up courses on green transformation, eco-civilization construction, environmental protection and sustainable development and in the policies of the central government in the party schools and administrative colleges; enhance the interpretative and cognitive abilities and related training of policy implementers at all levels; strengthen professional knowledge training for employees of the environmental courts and cultivate a group of professionally skilled and competent employees to work in legal services; invite environmentalists to participate in judicial adjudication on environmental problems as jurors or expert witnesses; and take the views of experts as evidence to confirm the facts of cases.

4.3. Enhance Market's Capacity to Internalize Environmental Externalities

Overall objective: Enterprises are the key players in green transformation. It is imperative to have incentive-compatible institutions and policies to provide signals to incentivize enterprises to engage in green businesses while gaining profits.

(I) Improve the property rights system on natural resources.

First, establish a property rights system for environmental assets. Environmental standards shall be established and an ecological red line must be set. The environmental carrying capacity for economic development should be determined and corresponding property rights specified. The purpose of this is to maximize the economic benefits of economic development.

Second, establish nationally an economic system for exercising this environmental carrying capacity ownership on behalf of the whole people; a "National Environmental Asset Operation Corporation" can be considered to contract

the environmental carrying capacity as an economic asset. This Corporation could allocate limited environmental carrying capacity for economic activities in such a way as to maximize economic benefits.

Third, establish an environmental asset property rights exchange market in order to enable the market mechanism to play a decisive role in allocating economic resources and enable the limited resource of environmental carrying capacity to be transferred to the production field where higher benefits can be obtained through the market. These ideas can be tested in local regions or basins.

(II) Promote economic utilization of resources through reform of the price mechanism for important resources; use fiscal taxation policies to make explicit the environmental costs of production and consumption; and create a healthy competitive market for environmental protection industries.

Price reform of important resources such as coal, oil and gas should be accelerated. Correct price signals are required for the market to effectively allocate resources. Only under the guidance of correct price signals and taking externalities into account will enterprises be motivated to utilize resources more efficiently and energy efficiency management services and other energy-saving environmental protection industries have more chance to develop. This will require first deregulating the prices of important resources and then establishing a pricing system, which is mainly determined by the relation between market supply and demand. Second it will be necessary to regulate and improve the taxing of resources so that they fully reflect resource scarcities. This can be done through determination of tax rates, which internalize environmental externalities, and in this way set a more reasonable price relationship between resources. Third it will be important to establish progressive water prices, electricity prices and gas prices and to promote resource savings.

Implement measures to encourage an increase in resource utilization efficiency. Tax reductions, allowances and other preferential treatments could be made available to any economic activity that recycles resources. The government could enact laws and regulations and relevant policies to define incentives or provide credits to those purchasing and using energy-saving and water saving materials, products, and equipment and facilities which are friendly to the environment. The government may enact laws, regulations and policies to support the development of clean energy, and energy-saving industries, including setting up funds to support R&E of clean technologies, risk investment funds, a platform for the promotion of new energy-saving and environmental protection technologies. The government could establish

and improve the eco-environmental damage compensation system, the eco-compensation system and other important systems.

To realize the green transformation, enterprises must be encouraged to improve their productivity and move towards a system of orderly competition. For this, intellectual property protection, protection of the legal rights of various ownership models from infringement, and the fair treatment of various market participants are needed. Second, anti-monopoly and anti-unfair competition laws and regulations, increased monitoring, investigation and prosecution, the breaking up of various monopolies and strengthening of government regulations on natural monopolies are needed. Third various regulations and practices hindering national market unification must be removed and local protectionism must be broken and national market unification must be accelerated. Fourth the administration must be streamlined at the same time that there is more decentralization. Reform of government functions should be accelerated, and various administrative approval behaviors strictly regulated in order to establish the rights of government while substantially reducing the government's intervention in micro-economic activities. Furthermore, attention should be paid to improving routine supervisory capabilities; strengthening monitoring through strengthening supervisory teams in the fields of environmental protection, consumer protection, and intellectual property right protections; and utilizing information channels to improve supervisory capabilities.

(III) An environmental credit system for enterprises should be established which accounts for capital costs and environmental costs in the same system, and at the same time basic information for implementing green financing needs to be provided.

Develop a differentiated pricing system for basic resources that would provide environmental credit to market actors who eliminate environmental externalities. For instance, Nantong city has raised the wastewater treatment rate for “Red” and “Black” enterprises. Recently, the *Notice on Improving Differentiated Water Price Policy* was jointly issued by the Pricing Bureau, the Environmental Protection Bureau and Finance Bureau of Nantong. Since 2009, Nantong has implemented a differentiated water price system, i.e. an additional 0.3 yuan/m³ and 0.5 yuan/m³ for wastewater treatment fee for “Red” and “Black” enterprises. In July 2014, Nantong government decided to further increase the wastewater water treatment fee for “Red” and “Black” enterprises, that is, the fee for 82 “Red” enterprises was increased from 0.3 yuan/m³ to 0.6 yuan/m³, and from 0.5 yuan/m³ to 1.00 yuan/m³ for 28 “Black” enterprises. The new standard was put into effect on August 1, 2014. Tariffs collected through this type

of water pricing system are collected through water supply entities and submitted to a governmental fiscal account which is to be for designated use. The differentiated price for “red” and “black” enterprises can be lowered to a normal price only if firms can improve their environmental credit up to the standard of “yellow” or better in a following year’s evaluation.

(IV) Incentivize leading companies to transform and green their supply chains.

Incentivize leading companies to transform and green their supply chains. Financial institutions may be encouraged to provide green financial services, giving financing support to the implementation of green supply chains. The government, enterprises and public institutions may jointly make contributions to set up a “Green Supply Chain Development Fund”, help create voluntary projects for green supply chains and accelerate the promotion of green supply chains in key sectors. The government may cooperate with WWF and other non-governmental organizations (NGOs), research institutes, and internationally known enterprises in key sectors and industries to conduct training related to laws, knowledge and skills tied to the green transformation and enterprises’ governance capacity and develop projects for best practices in green supply chains. The government could consider to support and promote the setting up a “green supply chain promotion center” and provide general services including certification, green supply chain planning and design, operation and management as well as energy performance contracting and platform operations.

(V) Incentivize enterprises to carry out green technology application and innovation

The government shall actively utilize multiple means to provide economic incentives for enterprise R&D and green technology applications. For this, a first step is to study approaches to governmental management which may be more adaptable to the innovation requirements of the green-oriented business model to really inspire enterprises drive to innovate. Second is to make full use of government purchasing power. The range and proportion of green products purchased should be steadily enlarged. Ways to standardize government green purchasing should be actively explored and energy management contracting and other energy-saving services should be employed. Third is to regulate financial funds so that they will embody green considerations. Various funds, including a financial incentive fund for energy savings and technical retrofitting and a special fund for closing down outdated production facilities, should be explored and established in order to improve the service

efficiency of financial funds. The multi-level financial subsidy system, including investment subsidies, output subsidies, and consumer subsidies, should be perfected. Fourth, standards should be strengthened, popularized and implemented.

(VI) Government, enterprises, and research institutes should jointly establish a network for sharing green information and technologies

The government, enterprises, research institutes and universities could work together to build a network for sharing green resources and technology. Relevant governmental authorities could take the lead to work with relevant institutes both at home and abroad and industry leaders to set up a public network platform for sharing green resources and technologies. The platform can create a catalogue of green technologies, green products, green services and green supply chains and push forward the work of improving green standard certification and environmental information data thereby reducing the cost for obtaining appropriate green information, resources and technology. Using the experiences of Australia and Germany in green development as reference, local governments, research institutes and enterprises can be supported to work together to create a green industry alliance and SME network to speed up the sharing and cooperation of appropriate green resources and technology.

4.4. Enhance Civil Society's Capacity to Participate in Green Transformation

Overall objective: Build public trust in the green transformation process by ensuring and enabling societal participation as a key driver of green transformation. Improve capacity of public and social organizations to participate in environmental protection.

(I) Change the name of the Department of Education and Communications under the Ministry of Environmental Protection to the Department of Education, Communications, and Public Participation

The Task Force suggests changing the name of the Department of Education and Communications under the Ministry of Environmental Protection to the Department of Education, Communications and Public Participation, highlighting its functional responsibility in general planning and encouraging the participation of the public and social organizations. The Department of Education, Communications and Public Participation is advised to set up a Public Participation Office, which may designate special personnel and allocate budget to carry out work related to public and social organizations' participation. Meanwhile, the Education and Communications Center

under the Ministry of Environmental Protection may change its name to the Education, Communications and Public Participation Center, highlighting its responsibility to organize the public's and social organizations' participation, so as to improve the execution of policies related to public participation.

(II) The coordination between governmental departments and social organizations should be strengthened

Mechanisms for communication and coordination, information sharing and project cooperation between the departments of environmental protection at all levels and social organizations, mass organizations, social undertakings and co-operatives engaging in environmental protection should be established. The level of public and social organization participation can be improved by enhancing such mechanisms and integrating social resources.

(III) Governmental support for environmental social organizations should be enhanced, especially in terms of funding, skilled individuals, and information.

Enhance governmental support for social organizations engaging in environmental protection. The main problems faced by Chinese social organizations engaging in environmental protection at present include shortages of funds and qualified personnel, insufficient information and data, difficulties in registration, and insufficient innovation. Therefore, the government may strengthen financial support to social organizations engaging in environmental protection by means of purchasing their services, funding their projects and providing preferential tax policies. The shortage of qualified individuals specialized in environmental protection can be solved by training and encouraging college graduates to be innovative or to start businesses in the field. The ability of social organizations to take part in environmental monitoring can be improved through environmental protection information disclosure. Local environmental protection departments shall be encouraged to serve as the responsible authority for social organizations engaged in environmental protection or such social organizations should be allowed to register directly, with a reduced threshold for registration. Improve the transparency and social trustworthiness of social organizations through government regulation, third-party assessment, self-discipline and media supervision. All in all, greater development space shall be given to the social organizations engaged in environmental protection while making improvements in their supervision and administration.

Actively guide other social organizations and mass organizations to take part in environmental protection. As of 2014, there are more than 600,000 social

organizations registered in civil affairs departments in China. The Women's Federation, the Communist Youth League and other networks can be found throughout the country. The government could actively guide such other social organizations and mass organizations which do not have an explicit environmental protection focus to carry out environmental protection activities, and enhance the efforts to train or praise those proactively taking part in the green transformation. Moreover, the government may take foreign experience as a reference and vigorously develop social enterprises and co-operatives in the sector of environmental protection, giving full play to social forces.

(IV) Encourage the public to take part in monitoring and reporting environmental protection data via modern communication technology.

Encourage the public to use modern information technology and reduce the restrictions for the public to participate in the green transformation. One reason not so many Chinese take part in environmental protection is that there are few channels to do so, making it difficult for them to be engaged. The experiences learnt from public participation in Bottrop, Germany and that learnt from the application of the IPE's pollution map APP in China show that building a platform for public participation and encouraging the public to use mobile internet technology can greatly reduce the restriction for public participation and inspire public engagement in environmental supervision. Such participation can enhance the public's understanding of environmental information, urge them to take proper measures, and help monitor whether the government and enterprises are fulfilling their responsibilities.

So long as the information is made public and the restriction for participation is reduced, Chinese will be enthusiastic about taking part in environmental protection activities. Since the IPE's APP is simple to use and environmental protection is closely bound up with everyone's daily life, the public has become fully mobilized behind environmental supervision. Since its release in 2014, there has been a sharp increase from 50,000 to 3,000,000 users of the pollution map. This shows that once the public is given the power to participate, their initiatives for environmental protection will be enhanced remarkably.

(V) Innovative education and communication strategies should be developed to promote green consumption and environmental protection.

The government can actively instruct the public to change their behavior patterns, by advocating green living and unleashing the potential of green demand as a stimulus for green industry. There should be innovative improvements made to how

environmental protection is publicized. Great efforts have been made in publicity and education for environmental protection in China, and initial results have been achieved. Still, although the public now pays more attention to environmental issues and environmental value, they still lack sufficient knowledge and skills about environmental protection. The government needs to continuously update its approach to publicity and education. In this regard, foreign experiences can be used as reference. Public private partnerships (PPPs) and social impact bonds (also known as “pay-for-success”), can improve the results of publicity and education and practically enhance the public’s knowledge and skills about environmental protection.

Motivate environmental protection behaviors of the public. A challenge with public participation for the green transformation is when there is environmental awareness but this does not carry over into environmental protection behaviors. Here too, domestic and foreign experiences can be taken as a reference. Great efforts should be made to support the development of community-based environmental protection volunteer organizations, green consumption co-operatives and green associations. The power of organizations can be used to cultivate the public to develop voluntary and sustainable environmental protection behavior and make green living and green consumption a habit, culture and societal fashion.

4.5. Policies Critical to the Capacity of Government, Market and Society

Recommendations on policies which are conducive to the enhancement of the governance capacity of the government, market and civil society

(I) Promote Information Collection, Integration, Usage, and Disclosure

Integrate, optimize, and strengthen existing information collection and monitoring systems related to the economy, environment and energy, and give a rational definition to the rights and mechanisms of information management and usage through legislation. Make information serve scientific research and evidence-based decision-making. Environmental information disclosure should be greatly promoted, including the status of pollution and its impact on human health. To disclose such information may incur mass outcry in the short-term, but in the long run, it helps to eliminate information asymmetry, increase environmental awareness, and reduce the obstacles for green transformation.

The existing environmental monitoring polices and standards are formulated based on geological locations and environmental mediums. However, it is essential to understand the relationships between environment, health risks and environmental

standards. The Ministry of Environmental Protection may consider interpreting environmental quality in relation to its health effects, developing activity guides and other approaches that are easy for the public to comprehend.

The disclosure of environmental information can have potentially negative effects on polluters, which makes it difficult for the public to obtain environmental information, or even harder especially when the polluter is very powerful in lobbying at the local level and local governments turn a blind eye to pollution. In accordance with the requirements of Chinese laws concerning disclosure of environmental information, the Ministry of Environmental Protection may consider setting up a Pollutant Release and Transfer Register (PRTR) system to reinforce its capacity to rate the environmental behavior of industries that cause pollution, to use it to enhance enforcement based on the rating results determined via interactive communication technology, and improve the effectiveness of environmental protection enforcement.

Environmental performance has been included in the assessment system of local government officials. The Ministry of Environmental Protection may consider providing the local government with the capacity to diagnose environmental problems and evaluate local environmental behavior. The Ministry may use such information to develop interactive tools, through which the citizens can supervise the environmental behavior of local governments. This would enhance the accountability system of the government.

(II) Enable Green Innovation in Green Technology, Management, and Culture

First, the national innovation system needs to be reoriented and redefined, so as to green the existing dominant technology system, in particular using technology clusters that have extensive driving and penetrating effect and can play a key role in green development once technology breakthroughs are made. Second, financial inputs and policy support for the R&D of green technology should be steadily enhanced. Credit loans, tax policies and allowances can be used to encourage and attract enterprises to invest in R&D and promote green technologies and products, and to strengthen their effort to introduce innovations on green technologies and equipment, and to make technical transformations for energy saving, water saving and material saving. Third, a government procurement system promoting independent innovation in green technology shall be implemented, giving priority to purchasing domestic hi-tech equipment and products with proprietary intellectual property rights. Fourth, social forces shall be mobilized to join government and industry in investing in green

technology R&D. Fifth, the reform of scientific and technological systems should be promoted to enhance cooperation between the governments, enterprises, R&D institutes, intermediaries and society. Publicity, education and training shall be enhanced to improve the awareness of governmental departments, enterprises and the public about the green transformation and to lay a good social foundation for the development of green technology. Sixth, the coordination between green policy and innovation policy should be strengthened in order to create a policy environment in favor of green technology innovation and give full play to the incentive effects of green policy on green technology innovation.

Cultural innovation involves developing useful and discarding useless traditional values. An important principle in coordinating the relation between human and nature is changing human's attitudes and behaviors about nature, so as to form an environmentally-friendly production mode and consumption pattern guided by scientific outlooks on development. *Our Common Future* points out that human survival and well-being could depend on whether there is success in elevating sustainable development to a global ethic. The ethic of sustainable development requires high cultural and moral standards from the people. People must come to understand the long-term impact of their behavior on nature and the survival and development of human society. They must be made aware of their solemn responsibility to society and future generations and be willing to sacrifice some short-term interests for the long-term interests of society. We should eliminate excessive consumption, the showing-off of wealth, the paying of too much attention to material interests and the sacrificing of the environment for profit, and adopt instead a pattern of moderate, green and sustainable consumption, so as to build up an ecological and green civilization.

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