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Climate Policy Adjustment and Government Leadership Enforcement in the Context of Chinese Government Institutional Reform

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1. Introduction

1.1 The challenge of global climate change is more severe than ever

From the perspective of natural threats, the IPCC's fifth assessment report and numerous research reports have pointed out that climate change is the most serious and urgent global challenge of our times. In October 2018, an IPCC special report – Global Warming of 1.5°C – has given a clearer signal. If the global temperature rises more than 2°C, the climate impact on survival and development of human being will be more significant, and yield worse consequences.

Since tackling the challenges of climate change requires to address both energy use and energy transition, solutions will require efforts and impacts in all the sectors of the economy. On one hand, in the current conditions, developing countries in general may deal with conflicting priorities between low-carbon transition and other development goals such as poverty alleviation. On the other hand, we must combine education; employment and income increase to reducing emissions. The sustainable emission reduction can hardly be achieved without economic growth, social progress and transformation of a country's development path, which adds both complexity and integration to the solutions to climate change. Therefore, it requires systematic and integrated solutions, timeline, and roadmap, priority and policy directions for the different development goals to address climate change.

In the global context, some major countries are trying to withdraw from the Paris Agreement and other international environmental agreements, this will bring new challenges to the global climate and environmental governance system. Trade wars will also directly affect the global climate change action and transition process. Unilateralism will further damage the process of international cooperation and transition, and the loss of biodiversity will also counteract poverty reduction efforts. In September 2019, the Climate Summit of the UN Secretary-General will be held at the United Nations Headquarters in New York. Heads of state will come together to discuss how to tackle climate change challenges more ambitiously and accelerate global low-carbon transition. The results of this summit are expected to take the pulse of near future climate governance.

The international community has reached a consensus on the necessity, in order to achieve the global climate targets, to transform production mode, lifestyle, and finance and to accelerate technology innovation. All countries should deepen cooperation and take action together to accelerate transition process, initiate an innovative global climate governance system, integrate climate change in economic development, poverty alleviation, living-condition improvement, environment

preservation, health protection and security, enhance mutual trust, build a community with a shared future for mankind, and lead a green, low-carbon and sustainable development globally.

1.2 China firmly implements the Paris Agreement and actively participates in global climate governance

The 19th National People's Congress of the Communist Party of China put forward a series of new concepts, new ideas and new strategies, aimed at achieving a moderately prosperous society in all respects by 2020, socialist modernization by 2035, and a modern powerful socialist country by the middle of the century. It also pointed out that China has become a participant, contributor and leader of global ecological civilization by actively guiding and taking part in international cooperation on climate change, and China will continue to closely participate in global environmental governance and meet emission reduction commitments in the future. The new strategic targets for development require urgent actions on rationalized institutional structure and functional allocation, comprehensive organizational preparation, institutional mechanism improvement, and integrated promotion of economic construction, political construction, cultural construction, social construction and establishment of an ecological civilization. Under these circumstances, China has promoted a new round of governmental institutional reform. On March 21, 2018, the full text of "Deepening the Reform of Party and Government Institutions Plan" (hereinafter referred to as the Plan) was published. Prior to that, the contents concerning the institutional reform of the State Council had been deliberated and adopted by the People's Congress, and the "Decision of the CPC Central Committee on Deepening the Reform of Party and Government Institutions" (hereinafter referred to as the Decision) had also been published. In line with the insights of the 19th National People's Congress of the CPC, this is a profound transformation aiming to promote the modernization of China's governance systems and governance capacity, aiming at "one matter or one type of matter being dealt with by one department, and enhancing collaboration between relevant institutions in an effort to prevent one policy from being formulated by multiple institutions, ensuring responsibilities of each institutions are clearly defined, and preventing institutions from shirking their duties."

The environment management system reform is one of the key elements of the Decision and the Plan. The Decision specifically mentions, "Reforming the systems for managing environment. We need to implement the strictest environmental protection system, establish an environmental governance system led by government, subjected businesses, and involving civil society organizations and the general public, so as to provide systematic guarantees for the ecological civilization." The Plan

specifies the functions of the newly established Ministry of Ecology and Environment, especially points out that “Protecting the environment is a basic national policy. We should treat the ecological environment as we treat life, implement the strictest environment protection system, form green development way and lifestyle, and focus on solving outstanding environmental issues. In order to integrate the deconcentrated responsibilities of ecological environmental protection, exercise responsibilities of supervision and administration on various pollution emissions from natural and urban/rural areas, strengthen environmental pollution control, ensure national ecological security, develop a Beautiful China. The Ministry of Ecology and Environment is composed as a part of State council, and it integrates the roles of former Ministry of Environmental Protection, and climate change and emission reduction responsibilities of the National Development and Reform Commission, the functions of the former Ministry of Land and Resources in monitoring and preventing groundwater pollution, the functions of the Ministry of Water Resources in compiling water function zoning, sewage outlet setting and management, and basin water environmental protection, the functions of the Ministry of Agriculture and Rural Affairs in monitoring and guiding the agricultural surface source pollution control, the marine environmental protection responsibilities of the State Oceanic Administration, the South-to-North Water Diversion Project areas’ environmental protection responsibilities of the South-to-North Water Diversion Project Commission Office of the State Council. The Ministry of Ecology and Environment retains the function of National Nuclear Safety Authority. The major functions of the ministry include formulating and organizing the implementation of ecological environment policies, plans and standards, monitoring the overall ecological environment and being in charge of law enforcement, supervising and controlling pollution, ensuring nuclear and radiation safety, and organizing the central supervision of environmental protection. We also set up an integrated law enforcement team for ecological environment protection, which takes law enforcement responsibilities with regards to pollution control and ecological protection related in departments of land, agriculture, water resources and ocean management, guided by the Ministry of Ecology and Environment.” In which it proclaims to integrate the reform of “the functions of the National Development and Reform Commission on climate change and emission reduction” explicitly. The Department of Climate Change of the National Development and Reform Commission, and the National Center for Climate Change Strategy and International Cooperation were transferred to the newly established Ministry of Ecology and Environment. Since then, the era of a **“comprehensive government department” of ecology and environment has begun.**

According to Li Ganjie, Minister of the Ministry of Ecology and Environment, at the press conference of the two sessions, the reform has solved two outstanding issues in China’s system of ecological environmental protection: “First, overlapping

responsibilities bring confusion in accountability; second, administrators and owners are not well distinguished, they are both athletes and referees. Some referees are independent, but the authority and effectiveness are not very convincing.” The reform integrates previous deconcentrated responsibilities of pollution control and ecological protection through “five links”. “First, we link the overground and underground, second the shore and water, third the land and ocean, fourth urban and rural, fifth CO and CO₂, that is integration of air pollution control and climate change.” The last link talks about the new tone of work after the transfer of climate change functions.

Global climate change has become the most important environment and development challenge around the world in the 21st century. It challenges human nature, social system, economic development mode, international politics and civilization. Facing current complex situation of “reversal of globalization” and rising protectionism in the world, global climate governance, as one of the few issues concerning international politics, economy and non-traditional security sectors after the cold war, is a “mirror” and “banner” of global governance reform, which will have profound impact on the existing international architecture and governance system. China has been actively promoting domestic green and low-carbon growth, innovating development paths, participating in the process of global climate governance constructively and guiding international cooperation in addressing climate change. Especially China played an important historic role in the process of the arrangement, signing, enactment and implementation of the Paris Agreement, which has been widely recognized by the international community, including the United Nations Secretary-General. China has become “an important participant, contributor and leader in the global ecological civilization”. Around the announcement of the United States’ decision to withdraw from the Paris Agreement, President Xi Jinping and other government leaders on many occasions reiterated China’s strong determination to work together with all parties, adhere to the achievements of the Paris Agreement, jointly promote the implementation of the Paris Agreement and build a clean and beautiful world. They also released positive signals to the world that China will firmly stick to the path of green and low-carbon development and shoulder 100% of its own responsibilities, and to lead the global ecological civilization. These signals have promptly consolidated the confidence and determination of the global climate change community, fully demonstrated China’s strong sense of duty to build a community with a shared future for mankind, and laid a defining feature of the joint efforts of all parties to fully implement the Paris Agreement and the commitment of Nationally Determined Contributions.

1.3 Climate governance challenges in the new era

After The 19th National People’s Congress of the CPC, on one hand, the international community has new expectations regarding China’s climate policies and

actions, hoping in particular that China could fill the “gap” of leadership in global climate governance after the withdrawal of the United States from the Paris Agreement. On the other hand, international public opinion also sits on the fence on the impact of transferring the climate change portfolio from the National Development and Reform Commission to the Ministry of Ecology and Environment. International public opinion even believes that addressing climate change in China will fall into the “end-of-pipe” pollution control without “strong” macroeconomic and energy industry management functions, and questions whether the management system for tackling climate change been “weakened” by the institutional adjustment.


How to better promote and strengthen the fight against climate change and better fulfil the role of “the leader of global ecological civilization” under the new system of ecological environment protection? How to provide strong institutional safeguard for the Chinese government to integrate the management of air pollution control and fight against climate change through the system reform, and create new opportunities for China to contribute and lead the multilateral process of global climate change? How to make the work of fighting against climate change more practical and efficient? How can China leave its mark in the establishment of a new era of global ecological civilization, follow the principle of achieving shared growth through dialogue and collaboration in engaging in global governance, and commit to build a community with a shared future for mankind? This report aims to make a preliminary discussion on the above issues and provide some suggestions.

2. International Experience and Lessons Learnt- Major Types and Characteristics of Climate Governance Structure

2.1 Diversity in climate governance structure between countries

This report studies the governmental organization of 13 countries and the EU for policies regarding climate change, energy and the environment, more specifically air quality. Based on their ministerial organization, the countries can be divided within three categories, see Table 1:

Table 1: Organization of air quality, climate change and energy portfolios

Policies	Air Quality	Climate change	Energy
	Integrated ministry for environment, energy and climate change		
France 	Ministry for the Ecological and Inclusive Transition <i>Directorate General for Energy and Climate</i>		
Sweden	Ministry of the Environment and Energy		
	<i>Natural Environment Division</i>	<i>Climate Division</i>	<i>Energy Division</i>

Australia	Department of the Environment and Energy		
	<i>Deputy Secretary for Climate Change and Energy innovation</i>		<i>Deputy Secretary for Energy</i>
	Integration of environment and climate change		
Germany	Federal Ministry of the Environment, Nature Conservation and Nuclear Safety (BMU)		Federal Ministry for Economic Affairs and Energy (BMWi)
	<i>"IG" Directorate</i>	<i>"KI" Directorate</i>	
Poland	Ministry of Environment Department of Air Protection and Climate		Ministry of Energy (current form 2015)
Canada	Environment and Climate Change Canada		Natural Resources Canada
United States	Environmental Protection Agency		Department of Energy
India	Ministry of Environment, Forest and Climate Change		Ministry of Power and Ministry of New and Renewable Energy
Brazil	Ministry of the Environment		Ministry of Mines and Energy
South Africa	Department of Environmental Affairs Air Quality and Climate Change		Department of Energy
	Integration of energy and climate change		
UK	Department for Environment, Food and Rural Affairs (DEFRA)	Department for Business, Energy and Industrial Strategy (BEIS) <i>Minister of State for Energy & Clean Growth</i>	
Netherlands	Ministry of Infrastructure and Water Management	Ministry of Economic Affairs and Climate Policy	
	<i>DG for the Environment and International Affairs</i>	<i>DG for Energy, Telecommunications and Competition</i>	
EU	Commissioner for Environment, Maritime Affairs and Fisheries	Commissioner for Climate Action and Energy	
	<i>Directorate-General for Environment</i>	<i>Directorate-General for Climate Action</i>	<i>Directorate-General for Energy</i>
Japan	Ministry of the Environment	Both Ministry of the Environment and Ministry of Economy, Trade and Industry	Ministry of Economy, Trade and Industry <i>Agency for Natural Resources and Energy</i>

(1) A single ministry is in charge of climate change, energy and environment. This is the case in France, Sweden and Australia.

(2) There is one ministry in charge of affairs related to climate change and environment, and another one for energy issues. This is the most common case encountered among the countries covered by this study: e.g. Germany, Poland, Canada, the United States, India, Brazil and South Africa.

(3) Finally, in some cases, climate change is under the responsibility of a ministry in charge of energy and climate change but environmental issues are dealt with in a separate ministry. This is the case in the United Kingdom, the Netherlands, the EU and in some extent Japan where both the METI and the MOE seem in charge of climate change.

This organizational consideration will have an impact on the decision making and on the ability for the department or agency in charge of climate change mitigation to coordinate energy and climate change policies and to make them mutually supportive.

On the contrary, when climate change and energy are managed by separate ministries, there have been cases where the Ministries in charge of climate change and energy would express diverging views regarding the GHG emission reduction targets or the means of achieving a national target, showing internal disagreements and struggles.

Eventually, regardless of the structural organization, some cross-governmental coordination is bound to take place for national positions, such as the NDC submission under the Paris Agreement.

2.2 Case study: detailed organization and climate action for France and Germany

2.2.1 National climate governance in France

In France, the Directorate General for energy and climate is in charge of all climate, energy and air quality related matters and is part of a large ministry in charge of environment and energy (Ministère de la transition écologique et solidaire), taking different names under recent governments, but constantly in charge of all energy and climate matters since 2008.

(1) Co-implementation and co-management at local level

In some countries, climate change regulations and air quality or pollution regulations at local level are co-implemented and co-managed by local offices of the

ministry of environment. For instance, they would be in charge of the validating the monitoring, reporting and verification of GHG emissions, as well as the authorizations, control and reporting of pollutants emissions.

In France, the regional offices for the environment, planning and housing are in charge of monitoring and delivering the operation permits for large industrial installations and polluting installations in accordance with the regulation on installations classified for environmental protection. Since the beginning of the EU ETS, they are also in charge of following and validating the MRV process for GHG emissions. As they are responsible for delivering operation permits, they will monitor every significant change in the physical machinery and operations of the plants. This will in turn help check the quality of GHG emissions data and its consistency with other information gathered at the local level.

(2) Benefits of cross-governmental coordination in France

France provides a good example of cross-department and cross-ministry coordination. For all European negotiations, including issues concerning climate and energy, the lead ministry in charge of the file prepares all national positions. For climate and energy issues, this task falls under the DG for energy and climate in the ministry for the ecological and inclusive transition. Once this leading ministry has prepared a draft position for the French government, it is sent to the General Secretariat for European Affairs (SGAE) which conducts a cross-governmental consultation with all concerned DGs, including the DG for the Treasury, DG for businesses, the Ministry of Foreign Affairs, and Ministry of Agriculture (see Figure 4: Example of process for cross-governmental coordination). The consultation by the SGAE is the place where possible diverging views between ministries will be expressed, discussed and consolidated into the formal French national position for the negotiation. A few specificities are key to the French system that will allow a single consistent French position to be expressed and relatively good cooperation between ministries:

- The consultation toward building a consensus is done by a neutral party. The SGAE holds neither expertise nor position on the subjects. It will only requests comments to each concerned DGs and try to build a consensual position. Only if it fails to find a compromise, will the SGAE relay the problem to the Prime

Minister's cabinet (from which the SGAE depends directly) to take a final decision.

- The consultation and discussions between ministries happen at technical level. It's directly the experts on each subject that are consulted, draft comments and find compromises toward a national position built bottom-up. This way, cooperation and mutual understanding of positions start from the expert level. This will also allow for very regular consultations that limit the possibility for long-standing divergence between ministerial positions. For instance, in a normal EU negotiation process, the SGAE will be conducting consultations for each round of working parties, which typically happens every two to four weeks.
- When speaking for the French authorities in public meetings and negotiation working groups, agents regardless of their ministry of origin are required to express the official national position.

In practice, this also provides the opportunity to discuss contentious issues between ministries on a regular and systematic platform. Also, as the SGAE deals systematically with day-to-day negotiation, it's not a high level arbitrage and the experts in charge of the files are fully involved in the cross-cutting consolidation and will seek compromise. If on the contrary the arbitration process was only to happen for political issues at high stakes, then ministries could develop quite different positions before a national consolidated position is eventually arbitrated (see chapter for Germany).

2.2.2 National climate governance in Germany

In Germany, the ministry in charge of environment and climate change (Federal Ministry of the Environment, Nature Conservation and Nuclear Safety, Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit - BMU) is separated from the ministry for energy and economy (Bundesministerium für Wirtschaft und Energie, BMWi), see Figure 8: Organizational chart of climate and related policies governance in Germany.

The BMU has a Directorate General in charge of climate policies and a separate DG in charge of risk prevention, including pollution. The BMWi is in charge of energy policies and the economy. It contains a DG in charge of electricity policies: the energy transition (Energiewende), renewable energies policies, the effect of the EU ETS and carbon price on the energy system, and the grid. A second DG is in

charge of “energy efficiency” in terms of heating, industry energy efficiency, renewable heat, etc.

During the European carbon market reform negotiations, due to differentiated ministry for energy and climate matters, Germany had difficulties emerging with a unified position. Due to the lack of cooperation and arbitrage at technical level between the ministries in charge of climate and energy, there might be some circumstances where the two ministries will publicly show different positions. This duality will only be solved when the divergence is big enough for the higher political level (Chancellor level) to arbitrate,. It also means that most technical issues that are not politically relevant enough are often not arbitrated before a larger issue comes up.

Unfortunately, this would often lead to a longer needed time to find a national position, and a weaker standing point in the international negotiations. Also, this may sometimes lead to German ministries for energy and climate only being able to agree on the less political issues and on the “lowest common denominator”, which can be less ambitious from a climate point of view.

More examples of co-actions and illustrations of international experience are presented in the annex. In Table 3 in the annex, a summary of advantages and challenges of establishing the climate change portfolio under the Ministry of Environment, and ways to tackle the challenges and fulfil the opportunities, is presented based on solutions learnt.

2.3 Lessons learnt from international experience

Governance is essential to be able to tackle the challenges of climate change efficiently. The ministerial structure in charge of climate change in relation to those in charge of air quality and energy is important. Depending on the proximity between these parts of the administration, organic cooperation and deep interaction can occur naturally. In turn, this integration can help exploit the co-benefits of measures and prevent incoherencies between policies.

However, different functioning systems of ministerial governance in the world demonstrate that the range of subjects impacting climate change requires cross-cutting linkages regardless of ministerial portfolios. The challenge of climate change is so systemic and it needs such a transformation of the whole economy that no ministry can do it alone. The international experience shows multiple solutions from different countries in terms of governance to facilitate and catalyse climate action.

In light of the analysis done on multiple countries around the world, a check-list of issues and measures concerning the governance of climate change that could support ambitious and efficient action is suggested in the annex.

3. Opportunities and Challenges of Climate Governance in China after the Institutional Reform

3.1 The 2018 reform of climate change institutions

In 2018, the functions of climate change and emission reduction of NDRC were transferred to the newly established Ministry of Ecology and Environment. Since then, the Ministry of Ecology and Environment has undertaken the daily operation of the Leading Group in dealing with climate change and emission reduction.

On September 11, 2018, the Plan of setup and functions, internal institutions, and auxiliary staffing (duties, institutions, and personnel) of the Ministry of Ecology and Environment was officially released. Part Ten, Article Three of the Plan describes the main responsibilities: the Ministry of Ecology and Environment is “responsible for addressing climate change, will organize and formulate major strategies, plans and policies for tackling climate change and reducing GHG emissions. [The MEE] leads the relevant departments to organize and participate in international negotiations on climate change. [The MEE is] Responsible for the implementation of United Nations Framework Convention on Climate Change (UNFCCC).” The Plan clarifies the functions of the Ministry of Ecology and Environment in addressing climate change, and sets up a Department of Climate Change ranking 11th in the Ministry under Article Four, right after the Department of Atmospheric Environment (Atmospheric Environment Administration of the Beijing-Tianjin-Hebei Region and Surrounding Areas). The description of duties, institutions, and personnel for Department of Climate Change is very simple. The Department will “Analyze the impact of climate change on the economic and social development; carry out China’s role in the United Nations Framework Convention on Climate Change and work with relevant governmental departments to participate in international negotiations and conferences; implement clean development mechanisms; carry out the daily operations of the National Leading Group on Climate Change, Energy Conservation, and Emission Reduction”, which is inconsistent with the climate change related responsibilities of the Ministry of Ecology and Environment mentioned in the Plan. Indeed, the Department lacks functions such as “formulating major strategies, plans and policies for tackling climate change and reducing GHG emissions” and “leading the relevant departments to organize and participate in international negotiations on climate change”, etc. Except for Department of Climate Change, the Department of Ecological and Environmental Monitoring undertakes the role of “Organize monitoring of GHG emission reductions”. To some extent, this has also aroused public concerns about the “spin-off and weakening” of the Department of Climate Change.

Unlike the Plan of duties, institutions, and personnel, the implementing measures of internal structures of the Ministry of Ecology and Environment subsequently issued have greatly retained the original duties, institutions and personnel of the Department of Climate Change. The specific institutions and functions, and comparison of functions before and after the reform are as shown in Table 2. For the Department of Climate Change itself, its own functions and internal institutions setup have remained basically unchanged. Only the “GHG emission reduction monitoring” related functions have been incorporated into the Department of Ecological and Environmental Monitoring, while “taking the leading role in implementing international conventions on the protection of the ozone layer” has been added to its responsibilities. In addition, the Department of Climate Change is responsible for “Developing and administering the national greenhouse gases emission trading scheme”.

Table 2 Comparison of climate change functions before and after the reform

Pre-reform (National Development and Reform Commission)	After the Reform (Ministry of Ecology and Environment)
1. Study the international situation and major national trends of climate change comprehensively; Analyze the impact of climate change on China's economic and social development, and put forward general measures and suggestions.	Comprehensively analyze the impact of climate change on the economic and social development.
2. To organize the formulation of key strategies, plans and policies for addressing climate change; Implement specific measures and actions on climate change mitigation and adaptation; Carry out communication campaigns on climate change, and study and put forward legislative proposals for relevant laws and regulations.	Implement proactive national strategies on climate change; Initiate the formulation and the implementation of China's major objectives, policies, programs and plans, and institutions on the control of greenhouse gas emissions, on the promotion of green and low-carbon development, and on the adaptation to climate change; Provide guidance to other governmental departments, industries, and local governments in such implementation.
3. Initiate the formulation and the implementation of national scheme on climate change; Provide guidance to other governmental departments, industries, and local governments in formulation and implementation of local plans.	
4. Carry out China's role in the United Nations Framework Convention on Climate Change and work with relevant governmental departments to participate in international negotiations and conferences; Organize and formulate a national report on climate change implementation; Compile national GHG emission inventories.	Carry out China's role in the United Nations Framework Convention on Climate Change and work with relevant governmental departments to participate in international negotiations and conferences; Take the leading role in implementing international conventions on the protection of the ozone layer.

<p>5. Study and put forward proposals of general policies and measures for China's participation in international negotiations on climate change; Take the leading role in formulating and organizing specific negotiation proposals; Work with relevant governmental departments to take the lead and participate in international negotiations and conferences.</p>	<p>Work with relevant governmental departments to take the lead and participate in international negotiations and conferences.</p>
<p>6. Formulate plans for capacity-building to face the challenge of climate change; Carry out scientific research and systematic observation on climate change.</p>	<p>Build the capability to face the challenge of climate change, and conduct research and publicity campaigns on climate change.</p>
<p>7. Formulate guidelines on international cooperation on climate change; Coordinate major international cooperation activities on climate change; Undertake bilateral, multilateral cooperation activities on climate change; Review sensitive data and information involved in international cooperation activities.</p>	<p>Promote the bilateral, multilateral, and South-South cooperation and exchanges on climate change.</p>
<p>8. Carry out the clean development mechanisms; Take the lead in project audits of clean development mechanisms; Work with relevant governmental departments to supervise the activities of the clean development mechanisms fund; Study the mechanism of GHG emission trading markets.</p>	<p>Implement clean development mechanisms; Develop and administer the national emission trading scheme.</p>

9. Carry out the daily operations of the National Leading Group on Climate Change, Energy Conservation, and Emission Reduction; Responsible for centralized management of climate change affairs; Guide and coordinate local governments in addressing climate change.	Carry out the daily operations of the National Leading Group on Climate Change, Energy Conservation, and Emission Reduction.
10. To undertake other tasks assigned by the NDRC leadership.	/

At the same time, along with the new leadership elected, the advancement of the institutional reform and the transfer of climate change-related affairs during 18th National Congress, the members of the National Leading Group on Climate Change, Energy Conservation and Emission Reduction have also changed, as shown in Table 3. Except changes of related department heads, the major changes include: (1) The changes caused by merger, cancellation and reorganization of departments, such as the Ministry of Land and Resources and the State Oceanic Administration transferred to the Ministry of Natural Resources, the Ministry of Environmental Protection transferred to the Ministry of Ecology and Environment, the Ministry of Agriculture transferred to the Ministry of Agriculture and Rural Affairs, the National Health and Family Planning Commission transferred to the National Health Commission, the General Administration of Quality Supervision, Inspection and Quarantine transferred to the State Administration of Market Regulation, the State Forestry Administration transferred to National Forestry and Grassland Administration, and Legislative Affairs Office of the State Council transferred to the Ministry of Justice, etc. (2) The Minister of Foreign Affairs and the Head of the National Development and Reform Commission are no longer members of the Leading Group, left only the Vice Minister of Foreign Affairs and the Deputy Director of the National Development and Reform Commission; (3) The Minister of Culture and Tourism, the Governor of the People's Bank of China and the Chairman of China International Development Cooperation Agency are added as members of the Leading Group; (4) The Vice Minister in charge of climate change, energy conservation and emission reduction affairs (formerly is Deputy Director Xie Zhenhua) is no longer a member of the Leading Group. Generally speaking, the departments covered by the National Leading Group on Climate Change, Energy Conservation and Emission Reduction have increased, especially those related to culture, tourism, finance and international development and cooperation, which provides an institutional foundation for collaboration on climate change issues such as investment and financing, carbon finance, South-South cooperation and other related issues. But at the same time, the Minister of Ecology and Environment ranking 11th among the group members only (NDRC ranks 3rd

before), with the fact that the Vice Minister in charge of climate change, energy conservation and emission reduction is no longer retained as a member in the leading group may affect the coordination ability of the climate change departments and further increase the difficulty of reaching an agreement on climate change issues within the Leading Group.

Table 3 Comparisons of group members of National Leading Group on Climate Change, Energy Conservation and Emission Reduction before and after the institutional reform

	On July 9th, 2013	On July 19th, 2018
Group Head	Li Keqiang, Premier	Li Keqiang, Premier
Deputy Director	Zhang Gaoli, Vice Premier Yang Jiechi, State Councilor	Han Zheng, Vice Premier Wang Yi, State Councilor
Members	Xiao Jie, Deputy Secretary-General Wang Yi, Minister of Foreign Affairs Xu Shaoshi, Director of NDRC Yuan Guiren, Minister of Education Wan Gang, Minister of Science and Technology Miao Wei, Minister of Industry and Information Technology Li Liguang, Minister of Civil Affairs Lou Jiwei, Minister of Finance Jiang Daming, Minister of Land and Resources Zhou Shengxian, Minister of Environmental Protection Jiang Weixin, Minister of Housing and Urban-Rural Development Yang Chuantang, Minister of Transport	Ding Xuedong, Deputy Secretary-General Kong Xuanyou, Vice Minister of Foreign Affairs Zhang Yong, Deputy Director of NDRC Chen Baosheng, Minister of Education Wang Zhigang, Minister of Science and Technology Miao Wei, Minister of Industry and Information Technology Huang Shuxian, Minister of Civil Affairs Fu Zhenghua, Minister of Justice Liu Kun, Minister of Finance Lu Hao, Minister of Natural Resources Li Ganjie, Minister of Ecology and Environment Wang Menghui, Minister of Housing and Urban-Rural Development Li Xiaopeng, Minister of Transport E Jingping, Minister of Water Resources Han Changfu, Minister of Agriculture and Rural Affairs Zhong Shan, Minister of Commerce Luo Shugang, Minister of Culture and Tourism Ma Xiaowei, Director of National Health Commission

<p>Chen Lei, Minister of Water Resources</p> <p>Han Changfu, Minister of Agriculture</p> <p>Gao Hucheng, Minister of Commerce</p> <p>Li Bin, Director of National Health and Family Planning Commission</p> <p>Jiang Jiemin, Director of State-owned Assets Supervision and Administration Commission</p> <p>Wang Jun, Director of State Taxation Administration</p> <p>Zhi Shuping, Director of General Administration of Quality Supervision, Inspection and Quarantine</p> <p>Ma Jiantang, Director of National Bureau of Statistics</p> <p>Zhao Shucong, State Forestry Administration</p> <p>Jiao Huancheng, Deputy Secretary-General, Director of National Government Offices Administration</p> <p>Xiao Yong, Deputy Director of Legislative Affairs Office</p> <p>Bai Chunli, President of Chinese Academy of Sciences</p> <p>Zheng Guoguang, Director of China Meteorological Administration</p> <p>Wu Xinxiong, Deputy Director of NDRC, Director of National Energy Administration</p> <p>Liu Cigui, Director of State</p>	<p>Yi Gang, Governor of the People's Bank of China</p> <p>Xiao Yaqing, Director of State-owned Assets Supervision and Administration Commission</p> <p>Wang Jun, Director of State Taxation Administration</p> <p>Zhang Mao, Director of State Administration of Market Regulation</p> <p>Ning Jizhe, Deputy Director of NDRC, Director of National Bureau of Statistics</p> <p>Wang Xiaotao, Chairman of China International Development Cooperation Agency</p> <p>李宝荣 国务院副秘书长、国管局局长</p> <p>Li Baorong, Deputy Secretary-General, Director of National Government Offices Administration</p> <p>白春礼 中科院院长</p> <p>Bai Chunli, President of Chinese Academy of Sciences</p> <p>刘雅鸣 气象局局长</p> <p>Liu Yaming, Director of China Meteorological Administration</p> <p>努尔·白克力 发展改革委副主任、能源局局长</p> <p>Nuer Baikeli, Deputy Director of NDRC, Director of National Energy Administration</p> <p>张建龙 林草局局长</p> <p>Zhang Jianlong, Director of National Forestry and Grassland Administration</p> <p>杨宇栋 交通运输部副部长、铁路局局长</p> <p>Yang Yudong, Vice Minister of Transport, Director of National Railway Administration</p> <p>冯正霖 交通运输部副部长、民航局局长</p> <p>Feng Zhenglin, Vice Minister of</p>
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	<p>Oceanic Administration Lu Dongfu, Vice Minister of Transport, Director of National Railway Administration</p> <p>Li Jiayang, Vice Minister of Transport, Director of Civil Aviation Administration of China</p> <p>Xie Zhenhua, Deputy Director of NDRC</p>	<p>Transport, Director of Civil Aviation Administration of China</p>
<p>说明 Notes</p>	<p>The daily operations of the National Leading Group on Climate Change, Energy Conservation, and Emission Reduction is undertaken by the NDRC.</p>	<p>The daily operations of the National Leading Group on Climate Change, Energy Conservation, and Emission Reduction is undertaken by the Ministry of Ecology and Environment and the NDRC in line with their own responsibilities.</p>

3.2 The impact of institutional reform on climate change administration capability

In addition to the adjustment of the dominant institutional functions and the composition of the leadership group, the recessive factors such as different function definitions, ways of working, and resource allocation capacity of the National Development and Reform Commission and the Ministry of Ecology and Environment will also impact on the practices of addressing climate change. Table 4 summarizes the respective characteristics of NDRC and the Ministry of Ecology and Environment, as well as the advantages and disadvantages they may bring to the implementation of their climate change responsibilities. As a macro-control department, the National Development and Reform Commission is in charge of studying, formulating and implementing strategies of national economic and social development, annual plans, medium and long-term development plans, coordinating economic and social development, directing and promoting the restructuring of economic system and strategic adjustment of economic structures, which make it having more advantages in promoting the leading position of climate change in overall national strategies and strengthening the top-level planning of climate change policies, and can coordinate the relationship between climate change and economic and social development, energy, environment and other aspects at a higher level. It also has stronger capability to allocate and mobilize resources to promote agreement between all departments. At the same time, since the NDRC is also responsible for the coordination of energy,

sustainable development, energy conservation and emission reduction, it is also helpful for the integrated consideration and coordinated implementation of goals and policies on climate change, society-wise energy resources conservation, and low-carbon energy development. In addition, through the past 20 years of capacity building in leading and coordinating climate change affairs, the NDRC has gradually established a local team with knowledge, experience and capability to deal with climate change, especially in the policy sectors of GHG reporting, monitoring, and verification, carbon intensity target assessment and carbon market which require stronger industry background knowledge. The change of local teams caused by the portfolio transfer may result in greater costs of retraining and grinding-in. Nevertheless, it is undeniable that the Department of Climate Change, being a relatively weak department in an all-encompassing and macro-level National Development and Reform Commission, has been detrimental to the Department's work to some extent. For one thing, NDRC has always paid more attention to the economy and development aspects, resulting in some NDRC leaders considering climate change in opposition to development without a thorough understanding of it, paying more attention to the costs of the fight against climate change, which hinders more ambitious climate change targets and policies. For another, the influence of the NDRC over most ministries limits the openness on the climate issue, resulting in more reliance on internal policies and department regulations for climate change, and climate change legislation is relatively lagging behind. The planning and formulation of related policies on carbon market, South-South Cooperation Fund did not fully take the roles of other departments into account, such as "The People's Bank of China, China Banking Regulatory Commission, China Securities Regulatory Commission, China Insurance Regulatory Commission" and the Ministry of Finance, which ultimately affects the policy performance.

Unlike NDRC, the Ministry of Ecology and Environment, which was upgraded to the former Ministry of Environmental Protection in 2008, still has a lower ranking among the relevant ministries, although its organization has changed several times with higher level and stronger functions. With ecology and the environment getting worse, the Ministry of Environmental Protection enters public view more than ever before. And it has made some achievements in improving ecological civilization and environmental protection. It has also become a key task for building a moderately prosperous society in all respects to win the battle against pollution and make "our skies blue" again. On the whole, the above-mentioned progress of environmental protection mainly depends on strict environmental law enforcement and administrative management measures, and a lot of forces have been put on environmental protection supervision. On the one hand, we pay attention to the establishment and improvement of the legal system, promulgates and amends the *Environmental Protection Law*, the *Law on the Prevention and Control of Air*

Pollution, the *Law on the Prevention and Control of Water Pollution*, the *Law on the Prevention and Control of Soil Pollution (Draft)* and the *Environmental Protection Tax Law*, etc, which play a good legal guarantee for the effective implementation of environmental protection. On the other hand, it has a strong administrative law enforcement team relying more on administrative measures and end-of-pipe regulation. For example, the central government inspections on environmental protection has achieved remarkable results, being implemented from the central level with Chinese characteristics, and is an important initiative closely related to China's political structures. However, it lacks long-term or market-based mechanisms, as well as basic measures to fight against climate change and pollution such as the link to the economic development model, industrial structure and energy structure. Its capability to formulate relevant policies is weak. After the establishment of a "large government department" of ecology and environment, the coordination of various elements within the department, such as climate change and regional environmental protection, is expected to be better addressed. Just as the "five links" mentioned by Minister Li Ganjie, the implementation of the *Environmental Protection Tax Law* and the establishment of the public supervision system will also help to improve the implementation of market principles and public participation. Yet at the same time, the relationship between ecology and environment and administration of natural resources and economic development is still not being effectively addressed. Establish a cross-department coordination mechanism, to make overall plans on major strategic issues such as building an ecological civilization, implementing the concept of green development, and building a community with a shared future for mankind, are important challenges that the Ministry of Ecology and Environment will be facing. In addition, other key factors of the effectiveness of climate policies will depend on the ability of the existing local environmental protection team to quickly implement the transfer, re-structure and capacity-building of local institutions, and to take existing advantages of the Ministry of Environmental Protection to do legislate climate change law and carbon market regulations. It will also depend on their ability and willingness to make better use of market principles to promote environmental protection and address climate change based on emission trading.

Table 4 Advantages and disadvantages of implementing climate change functions before and after institutional reform

	Before National Development and Reform Commission	After Ministry of Ecology and Environment
Advantages	<ul style="list-style-type: none"> ● Climate change plays a leading role in the overall national strategies; ● Top-level planning of climate change policies; ● Coordinate the relationship between climate change and economic and social development, energy and environment; ● Stronger capability to allocate and mobilize resources to promote agreement between all departments; ● Integrated consideration and coordinated implementation of goals and policies on climate change, conservation and utilization of social energy resources, and low-carbon energy development; ● Foster a good local team with knowledge, experience and capability to deal with climate change, especially in the policy sectors of GHG statistics/monitoring/verification, carbon intensity target assessment and carbon market which require stronger industry background knowledge. 	<ul style="list-style-type: none"> ● Attention to the establishment and improvement of the legal system, which provides legal protection for related operations; ● Strong administrative law enforcement team, such as the central government inspections on environmental protection which has achieved remarkable results; ● The coordination of various elements within the department, such as the climate change and regional environmental protection, is expected to be better resolved; ● Department of Climate Change has higher hierarchy in Ministry of Ecology and Environment than in NDRC; ● Coordination of <i>Environmental Protection Tax Law</i> and national emission trading scheme; ● The political background and strategic orientation of building ecological civilization, implementing the concept of green

		development, and building a community with a shared future for mankind
Disadvantages	<ul style="list-style-type: none"> ● Always paid more attention to economy and development and the costs of climate change mitigation; The lack of openness. For example the planning and formulation on carbon market, South-South Cooperation Fund did not fully take the roles of other departments into account, such as “The People’s Bank of China, China Banking Regulatory Commission, China Securities Regulatory Commission, China Insurance Regulatory Commission” and Ministry of Finance, which ultimately affects policy performance; ● Relies on internal policies and department regulations on climate change, and climate change legislation is relatively lagging behind; ● Department of Climate Change is a relatively vulnerable sector and lacks fund and implementing mechanism. 	<ul style="list-style-type: none"> ● Lack of capability in coordinating the relationship between climate change and natural resources and economic development; ● Relies too much on administrative measures and lack the application of long-term mechanisms and market principles, as well as fundamental measures for climate change and pollution control such as the adjustment of economic development models, industrial structure and energy structure. ● Lack of capability to allocate resources and formulate comprehensive policies with other departments; ● The extra cost of re-training and grinding-in for local teams.

With the gradual completion of government institutional reform, climate change policies enter a new starting point and faces new opportunities and challenges. **On the one hand**, the national planning of the central Party leadership shows strategic, long-term and in-depth considerations, which establishes a more unified and powerful institutional framework for the ecological civilization, forms a supervision and

administration mechanism for the ecological and environmental protection adapted to the new era, integrates climate change to fore short and long term, national and international synergies, and is capable of timely adjustment from lesson learnt. At the same time, despite the backlash against global climate governance and international cooperation, the overall landscape is still in a cycle of progress and reshaping. Climate change is still on the diplomatic agenda of major countries. Events with international influence are keeping the momentum up, and the attention of markets, society and public is growing. Innovations in policies, business and technologies emerge endlessly. The moral stand of global climate governance and international cooperation cannot be erased, and its efficiency is evidenced by recent successes. **On the other hand**, it is generally believed that the initial system of climate governance was built on the ways of working and characteristics of the NDRC, and is more closely integrated with macroeconomic management, energy conservation, renewable energy planning, special major projects, financial resources and local support. In the initial system, climate change issues were often regarded as “a development issue”. Now, as part of the Ministry of Ecology and Environment role, the work methods, allocation of resources and local teams may face new changes. At the same time, the current international climate equilibrium has changed, the isolationism trend is undermining multilateral rules and existing international order, and the initial close climate cooperation between China and the United States has ceased. Trade disputes, technological blockade, and focus on costs conversely affect the decision-making of domestic governments and enterprises. It is also argued that the task of tackling climate change is important but long-term and world-wide, while the task of preventing and controlling air pollution is urgent and domestic. Therefore, the Ministry of Ecology and Environment would prioritize on winning the battle against pollution, rather than addressing climate change. These concepts, external environment, team grinding-in and other issues are also challenges to be tackled after this institutional reform.

4. New expectations for the governance of climate change in China and its requirement on strengthening government leadership

The report to the 19th National Congress of CPC sets ambitious goals for China’s development till 2050, and divides the goals into two stages. Promoting ecological civilization and green and low-carbon development is an indispensable part of these goals. This requires China to uphold the principles of innovative, coordinated, green, open, and shared development, put in place the most stringent environmental protection regime, firmly pursue a model of sustainable development featuring increased production, higher living standards, and healthy ecosystems, establish and

move the economic system towards green, low carbon, and sustainable growth, revolutionize the way that energy is produced and consumed, build an energy system that is clean, low-carbon, efficient and secure, promote a simple, moderate, green and low-carbon way of life, develop a Beautiful China and create sound working and living environments for the people. At the same time, China should contribute to building a community with a shared future for all mankind. China will play an active part in global environmental governance, honor the commitment on emission reduction, and cooperate to tackle climate change. Close coordination is significant to address climate change and develop the economy, eradicate poverty, improve people's lives, protect the environment and ensure health. China will continue to play the role of global participant, contributor and leader in addressing climate change, and achieve green, low-carbon, climate-resilient and sustainable development globally.

The new era, new vision and new goals have put forward new requirements for accelerating ecological civilization and strengthening climate governance in China.

4.1 Climate change actions in china should be adapted to economic and social high-quality growth

The 19th National Congress of CPC puts forward two stages arrangement of “work hard for a further 15 years”, establishing a modern economic system towards green and low carbon, and sums up “Xi Jinping’s thinking on promoting ecological progress” with primary principle of “harmony between human and nature”. At the same time China will deepen its involvement in global environmental governance, formulate solutions for world environmental protection and sustainable development, and guide international cooperation on climate change. Therefore, as a new development vision, on the one hand, China regards green, low-carbon and circular development as the basic characteristic of modern economic system, and environmental and sustainable development goals are referenced under the connotation of “high-quality growth”. On the other hand, the strategies of the “14th Five-Year” Plan (2021-2025) should be integrated with developing a Beautiful China in 2035 and the 2050 emission reduction target, unifying the short, medium and long-term plans and identifying a consistent road map.

4.2 Climate change actions in china should be in line with the goal of developing a Beautiful China

The 19th National Congress of CPC regards “To attain a fundamental improvement in the environment and the goal of building a Beautiful China” as important aspects. Addressing climate change should give full play to forging synergy and become the main path to coordinate and lead green development, resolve outstanding environmental issues and strengthen ecosystem protection. 2035 and 2050

are the pivotal points for climate change and green and low-carbon development. The new direction of development towards low-carbon and climate adaptation is an important strategic measure to propel economic and social transition and properly resolve the problems of unbalanced and inadequate development.

4.3 Climate change actions in China should come down to social and economic structural changes

When the Central Finance and Economics Commission held a meeting last year to lay out strategies for winning the battle against pollution, it was clearly proposed to persist in preventing and governing from sources, adjust the “four structures” and achieve “four reductions and four increases”. First is to adjust the industrial structure, reduce excessive and outdated industries and increase new engines of growth. Second is to adjust the energy structure, reduce coal consumption and increase the use of clean energy. Third is to adjust the transport structure, reduce road transport and increase railway transport and the development of electric vehicles. Fourth is to adjust the structure of agricultural input (land use), reduce the use of chemical fertilizers and pesticides and increase the use of organic fertilizers. As a result, in 2018, the proportion of China coal consumption in primary energy dropped below 60% for the first time, with 59%.

4.4 Climate change actions in China should be in line with its role of key participant, contributor and leader of the global ecological civilization

Compared with the late 20th century, the main difficulties and characteristics of global climate governance in the new era have undergone profound changes. China is confronted with a series of more complex challenges of recognizing scientific facts and historic responsibilities, assuming corresponding responsibilities and obligations, expanding the amount of funds, accelerating transition and technology innovation, and carrying out international cooperation, etc. The international and domestic environment and conditions for China’s participation in global climate governance have changed. The idea of “zero-sum games” in tackling climate change needs to be abandoned, all parties should work together, do their best, learn from each other and establish a fair, reasonable and win-win global climate governance system. Dialogue should be promoted, contributing to a community with a shared future for low-carbon development, sharing the benefits of the low-carbon transition. A positive narrative for China’s role in fighting climate change should be put in place, promoting good practices illustrated in China’s low carbon development, providing transition experience for developing countries, and contributing its wisdom and plans to tackle climate change worldwide. Climate change mitigation and adaptation should also proactively be added to the main agenda of the Belt and Road Initiative and

South-South cooperation, further developing international low carbon production capacity and capital cooperation, striving to build a new platform for global climate governance and injecting fresh impetus into common sustainable development.

As General Secretary Xi Jinping especially mentioned in his speech at the National Conference on Ecological and Environmental Protection held after institutional transfer: “China should implement the national program to actively tackle climate change, foster a global climate governance system that is fair, reasonable and focus on win-win cooperation, demonstrate China’s strong sense of duty, and build a community with a shared future for mankind. China should work together to build a sound global eco-environment, deepen its involvement in global governance, formulate solutions for world environmental protection and sustainable development, and guide international cooperation on climate change.” These are new expectations for tackling climate change in the new era, giving the strategic direction for a well-functioning climate change department in the Ministry of Ecology and Environment after the structural transfer.

4.5 Climate change actions should seize the benefits of institutional reform and strengthen co-management and co-control in China

The main goal of transferring climate change functions to the Ministry of Ecology and Environment is to provide institutional guarantee for achieving high-quality growth, developing ecological civilization and a Beautiful China, and building a community with a shared future for mankind. The core is to maximize the synergies of controlling conventional pollutants and greenhouse gas emissions and promoting green and low-carbon development, that is, to help change models, adjust structures, improve the quality of growth, create new engines of growth, and promote green employment. Whether to reap the core benefits is the most important criterion to judge the performance of this institutional reform. To implement the reform plans is to integrate climate change management with the improvement of local environmental quality organically, and to achieve co-management and co-control. The allocation of existing political, legal, administrative, economic and technological resources for environmental management shall be optimized. The integrated application of different policy measures, such as administrative regulation, economic methods and communication and education, is needed. Climate change management should be integrated into existing policy infrastructure, such as statistics, monitoring, verification and law enforcement systems.

5. Suggestions on climate policy adjustment under China’s institutional reform

To accurately identify the role of Ministry of Ecology and Environment in climate change, to give full play to the political advantages of the Party's leadership and the socialist system in China, to make full use of the solid material foundations accumulated over the four decades since the launch of reform and opening-up, and to take climate change in China to a new high under the national institutional reform, we need to readjust from the concept, responsibility, operation and cooperation, and to reconstruct a new system of climate governance in China according to the new characteristics of the Ministry of Ecology and Environment.

5.1 Strategic positioning and change of the fight against climate change

5.1.1 The primary is political position

Climate change is an environmental issue as well as a development issue, but it comes down to a political issue, which need to be considered from both the international and domestic perspectives and achieve win-win on the national interests and international image. From the political view, the Ministry of Ecology and Environment can only do a better job in tackling climate change after the institutional reform. The “story” of China fighting climate change should be told abroad and at home, while serving the overall diplomatic work and demonstrating China's strong sense of duty abroad, and form a unified understanding and joint efforts at home. The “large environmental protection” concept of the Ministry of Ecology and Environment expresses that ecological and environmental protection is not a single department's role, but a major reform measure of the whole Party and country. The same is true for climate issues. The climate issues are not staying in a single department or ministry, but having a higher position and a broader working architecture. National Leading Group on Climate Change, Energy Conservation and Emission Reduction shall fully coordinate and promote joint actions in all sectors, departments, industries and regions. For example, the launch of national carbon trading market can only perform well when the responsibilities are divided reasonably to financial, industrial, local and market departments, and to truly fulfill the solemn commitment of the General Secretary. Similar with the South-South Cooperation Fund for climate change, which should be regarded as a national platform to promote global ecological civilization, and broader support from the external sectors are needed to make it better.

5.1.2 The core is strategic leadership

Addressing climate change is a long-term and important task, therefore more attention should be paid to long-term planning. The 19th National Congress of CPC has put forward the long-term strategies of “two centenary goals” and “work hard for

another two 15 years”, of which the pivotal points are 2020, 2035 and the middle of this century. These are in line with the strategic milestones of the update of the Nationally Determined Contribution under the Paris Agreement and the submission of a long-term strategy for low GHG emission, with both submission time in 2020. These targets and strategies are the core tasks in the next two years of climate change, which require continued attention and discussion outside the climate sector. Climate change should be integrated to economic and social development to put forward new ideas, visions, policies and strengths to the Millennium Plan for the sustainable development of the Chinese nation, the development of ecological civilization and Beautiful China, and building a community with a shared future for mankind. One should make best use of the advantages and bypass the disadvantages, focus on the long-term and global characteristics of climate change, mobilize all aspects of resources, emancipate the mind and seek truth from the facts, prioritize major issue and situation while thinking ahead to lead high-quality growth and global governance. Among them, the investigation of major developments and issues still need higher political level decision, including but not limited to whether to improve Nationally Determined Contribution in 2030 (such as implementation of total GHG cap control, early peaking), whether to gradually assume funding obligations (such as contributing to the Green Climate Fund), how to propose an updated Nationally Determined Contribution for 2025, and how to identify strategic objectives by the middle of the century, etc. For these long-term and global issues, we should introduce “climate milestones” and “Historical views” and strategic thinking in global climate governance.

5.1.3 The breakthrough lies in Synergy

Integration of climate change and air pollution control is an old topic, and arguing who is in a dominating position, of climate change or pollution control, would be vain. Now the focus should be put on optimizing existing resources to cooperate and achieve “1 + 1 > 2”. The prevention and control of air pollution has a good foundation in emission monitoring, supervision and law enforcement, and has a strong enforcement force in key areas such as Beijing-Tianjin-Hebei, for example the compulsory reduction of coal consumption. While climate change has more experience coordinating domestic and international efforts (such as “external drives internal”, policies and actions are generally announced on international occasions), formulating comprehensive objectives (such as integration of energy conservation/energy intensity, renewable energies and carbon sink targets) and applying market mechanism. Although emissions of GHG and air pollutants share the same root causes, their targets did not been completely match in the past. Based on the institutional reform, initiative should be taken to integrate efforts to tackle climate change, make full use of existing infrastructure and teams, form a coordinated

monitoring, statistics, reporting and verification system, formulate policies and measures of source emission reduction and end-of-pipe governance, establish a unified platform and market mechanism for cost reduction of transaction and regulatory, develop an assessment method based on integrated ecological performance, and serve green Belt and Road through international public products. In addition, in the areas of environmental legislation and environmental law, climate change should be integrated gradually and through revisions of the laws. And the integration of the two in the sectors of green planning, supervision, finance, technology, production and consumption is easier to achieve when the barriers and boundaries from the past are gradually broken.

5.1.4 The concretization lies in team building

The talent pool is essential for the aforementioned goals. An ecological and environmental protection team, politically strong, highly competent, rigorous, and brave enough to assume the responsibilities is needed to tackle climate change. After the institutional reform, the building of local institutions, teams and capacities is the major challenges. It may take three to five years to form a solid and effective union between the higher and lower levels. Generally speaking, the teams of existing environmental protection system can tackle climate change more pragmatically and professionally. In terms of intellectual support, compared to the NCSC's focus on domestic emission reduction policies and international negotiation, other research institutes under the Ministry of Ecology and Environment will be more likely to play a greater role in climate change science, impact and adaptation than before, including wider and more diverse support in the sectors of bilateral and multilateral cooperation.

5.2 Policy adjustment to address climate change in the near and medium terms

5.2.1 Improving ambition in early decarbonization of China economy

The 14th "Five-Year Plan period" is when the theory of "high-quality growth" to be tested in practice, is also a key period to answer to General Secretary Xi's call for ecological civilization. Early peaking and accelerating the speed of carbon emission reduction are crucial for China to fulfil its climate and emission reduction commitment to the world and its low-carbon economic transition. China should promote the establishment and operation of its national carbon market and realize carbon reduction target through the control of both total carbon cap and carbon intensity, of which the targets and systems to be determined during the 14th Five-Year Plan period as a replacement of the existing total energy consumption control. In addition, to achieve sustainable economic and social development, carbon emissions must be decoupled from economic development as soon as possible. The 14th

Five-Year Plan should integrate medium and long-term strategies, focus on three topics: to avoid investment in fossil fuel powered infrastructure, to accelerate the development and application of low-carbon technologies, and to forge a national policy reform on low-carbon future.

5.2.2 Comprehensively deepen the co-management of economic development, energy reform, environmental quality and climate protection

The National Leading Group on Climate Change, Energy Conservation and Emission Reduction shall function well in the battle against pollution, then promptly promote the structural transition in industrial, energy, transport and land use sectors, and comprehensively coordinate the policies and measures on objectives, planning, technology, investment and financing of development, energy, environment and climate change. **Binding indicators for climate change needs to be incorporated into the system of central government inspections on ecological and environmental protection** and be used as legal indicators resulting in punishment if not respected. The establishment of local climate change institutions should be regarded as a key inspection task in 2019 and 2020, and the existing system of inspections on ecological and environmental protection should be put to use to effectively promote the implementation of climate change policies. To improve greenhouse gas monitoring, reporting and verification systems, greenhouse gas should be integrated into existing environmental monitoring, statistics and control systems for building a common inventory list of greenhouse gas and other pollutants.

5.2.3 Emphasizing the structural change of energy consumption

Incorporate energy consumption related indicators into the 14th Five-Year Plan will help achieve the goal of total carbon cap control and economic green transition. By the end of the 14th Five-Year Plan (2025), coal shall account for less than 50% of primary energy consumption, non-fossil energy consumption reach 20% of primary energy consumption, and non-fossil power generation account for more than 40%. **Further control of coal consumption.** To continuously improve the quality of environment and air, the use of coal should be further controlled, energy efficiency increased, and China should strive to earlier achieve its emission reduction targets. Transition from coal in key areas such as the Beijing-Tianjin-Hebei Plain should be accelerated and set as examples. The use of alternative energies, including natural gas as a possible transitional energy and renewables as the long-term solution should be facilitated. Non-fossil power generation should be prioritized, coal-fired power should be restricted and its share in the energy supply limited. New investments in coal power plant will create lock-in effect, increase the risk of stranded assets and should be eliminated. Achieving a large share of renewables require a more comprehensive and integrated policy support. The up-scaling of renewables can be

facilitated by easier access to financial markets, financing schemes, priority granting of land, grid connectivity. Support should be increased for the economic transition of coal-dependent provinces and municipalities. **Actively promote the use of renewable energy.** China must update the Renewable Energy Law as well as Energy Conservation Law and develop new renewable energy policies to facilitate the deployment of renewables. Favorable market conditions should be put in place, including support policies for smart grids, energy storage, and the acceleration of the reform of the energy market. Cross-department coordination is needed to improve renewable competitiveness via facilitating market financing, land use, and financial market access for renewable technologies.

5.2.4 Strengthen system, infrastructure and capacity building for carbon market

A binding absolute cap for the sectors covered by the carbon market via top-level design should be implemented. Full allocation via auctioning for the power sector should be the rule, allowing for the use of revenues in further climate action, and other industrial sectors should be included as soon as possible in order to complete the carbon pricing mechanism. A stronger carbon pricing mechanism enabled by a permit-buying power sector and a stringent cap will support low carbon power production technologies and help avoid investments in foreseeably climate-incompatible energy infrastructure, preventing associated sunk costs.

5.2.5 Strengthen research and capacity-building of climate change adaptation and nature based solutions

An integrated comprehensive masterplan should be developed to link mitigation based on carbon sinks and adaptation to negative climate impacts of climate change on water resources, biodiversity, ocean management, human health and infrastructure. China needs to build up the database and information to support the linkage about the above-mentioned areas. China should develop thematic and strategic plans targeting at land use, including agriculture, forestry, wetland, grassland and land use change; agriculture use: tangible reduction of chemical fertilizers and pesticide use, and limiting methane emission; protection of ecological land.

5.2.6 Clearly identify “green and low-carbon development” as a fundamental principle to promote “Belt and Road” and South-South cooperation

“Greening and low carbon” is key to deal with the negative controversies of China’s Belt-Road Initiative (such as coal-fired power investment, transfer of high carbon & pollution overcapacity). By applying the “green and low carbon development” principle to all “Belt and Road Initiative” practices, China would help

Belt and Road Initiative partner countries to deliver their pledges under the Paris Agreement and the United Nations' Sustainable Development Goals (SDGs).

Various investment and financing tools should be used to expand climate financing channels and provide funding for the construction of the Belt and Road Initiative. Criteria such as ecological and environmental impact, carbon intensity and climate-related risk should be incorporated to the negative list system of overseas investment of the National Development and Reform Commission to guide green and low-carbon investments.

The role of non-state actors represented by cities in global climate governance should be enhanced and a “One Belt, One Road” low-carbon city alliance should be set.

Policy dialogues needs to be strengthened between the “Belt and Road” countries on environmental protection legislation and climate change targets, and the docking of green and low carbon standards should be promoted.