China's Policies and Actions for Addressing Climate Change （2017）

National Development and Reform Commission

P.R. China

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Contents

Foreword

Climate change is one of biggest challenges facing mankind in the 21st century. The Chinese Government has always attached great importance to tackling climate change and strengthened the work on low-carbon development and climate change adaptation since the beginning of 13th Five-Year Plan (FYP) period (2016-2020). As an important part of the five-year plan for national economic and social development, the *Work Plan for Controlling Greenhouse Gas Emissions During the 13th Five-Year Plan Period* has been formulated and implemented. Regional governments formulated and decomposed greenhouse gases (GHG) controlling targets, ministries and departments implemented policies and measures, sectors and enterprises took innovative actions, and the public participated actively.

Thanks to hard work, in 2016, the carbon intensity decreased by 6.6% from the 2015 level and the proportion of non-fossil energy sources increased to 13.3%. The tasks for afforestation and forestry protection were overfulfilled, the capacity for climate change adaptation and disaster prevention and alleviation were further strengthened and the systems and mechanisms for addressing climate

change were improved. The carbon market construction is underway in an orderly manner and will be officially launched in 2017.

Since 2016, China has continued the firm support of global climate governance process and been highly praised by the international community for the significant contribution to the conclusion and rapid entry into force of the Paris Agreement and the promotion of international cooperation in addressing climate change.

This annual report has been hereby issued to enable all parties to fully understand China's actions, policies and accomplishments in addressing climate change from 2016 onwards.

It is worth noting that the just-concluded 19th National Congress of Communist Party of China (CPC) raised higher requirements for addressing global climate change and promoting low-carbon development from the perspective of China and the world. In the future, we will develop a green, low-carbon and circular economy, build a clean, safe, efficient and low-carbon energy system, advocate a simple, moderate, green and low-carbon lifestyle, accelerate the formation of green low-carbon new growth drivers, promote the improvement of development quality, actively fulfill the mitigation commitment, and achieve the nationally determined contributions as scheduled. We will work with all countries around the world to tackle climate change and protect the Earth!

I. Climate Change Mitigation

From 2016 onwards, the Chinese Government has achieved positive results in mitigating climate change through a series of proactive measures, including adjusting the industrial structure, conserving energy and improving energy efficiency, optimizing the energy structure, controlling greenhouse gas (GHG) emissions from non-energy activities, and increasing carbon sinks.

(I) Adjusting the Industrial Structure

Boosting strategic emerging industries. The State Council issued the *13th Five-Year Plan for Strategic Emerging Industries*, which laid down comprehensive arrangements for strategic emerging industries in the five years, including development objectives, key tasks and policy measures, as well as put forward to promoting green low-carbon industries as pillar industries such as new-energy vehicle, new energy as well asenergy conservation and environmental protection industries. The State Council unveiled the *Guiding Opinions on Deepening the Integration of Manufacturing and the Internet*, calling for aligning the "Made in China 2025" and "Internet Plus" plans. The General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ), Standardization

Administration of China (SAC), and Ministry of Industry and Information Technology (MIIT) unveiled the *Standardization and Quality Improvement Plan for Equipment Manufacturing Industry*. MIIT released, together with the National Development and Reform Commission (NDRC), the *Guidelines for Information Industry Development* to promote the formation of an internationally competitive and safe information industry system. MIIT issued the *Development Plan forSoftware and Information Technology Service Industry (2016-2020)*. NDRC and MIIT released and implemented the *Opinionson Improving Management of Automotive Investment Projects* to boost the new-energy vehicleindustry while strictly controlling the increase of production capacity of traditional fuel vehicles.

Proceeding withcapacity reduction of energy-intensive industries. The State Council has introduced multiple policies and achieved significant results in cutting the capacity of energy-intensive industries since 2016. The State Council unveiled the *Opinions on Reducing Overcapacity in the Steel Industry to Achieve Development by Solving the Difficulties,* which required, in principle, to stop approving new coal projects, technological upgrading projects with added capacity, and capacity-expansion projects in three years from 2016 onwards, and where new mines are indeed needed, implement replacement at a reduced

amount. The State Council issued the *Circular on the Catalog of Investment Projects Approved by the Government (2016),* tightening the control of added capacity of such overcapacity industries as iron and steel, electrolytic aluminum, cement, plate glass, and shipbuilding. Efforts were continued to eliminate backward production capacity in steel and coal industries, which reduced the over production capacity of crude steel by more than 65 million tons and coal 290 million tons in 2016.

Bolstering the service industry. In 2016, the service industry witnessed vigorous development and made greater contribution to the national economic growth. The Ministry of Commerce (MOCOM) unveiled the *13th Five-Year Plan for Residential Services*, planning to initially build a quality, safe, convenient, coordinated, green and eco-friendly service system for urban and rural residents in 2020. China's sharing economy has prospered in all aspects and penetrated into various fields related to production and life, including transportation, housekeeping and logistics. The transaction volume of sharing economy attained 3452 billion yuan in 2016, according to the *Report on China's Sharing Economy 2017* published by the State Information Center (SIC) in February 2017. The Ministry of Environmental Protection (MEP) issued a notice to carry out the fifth pilot projects of environmental services. The People's Bank of China (PBC),

Ministry of Civil Affairs (MCA), China Banking Regulatory Commission (CBRC), China Securities Regulatory Commission (CSRC), and China Insurance Regulatory Commission (CIRC) jointly issued the *Guiding Opinions on Financial Support to Accelerate the Development of Old-age Services* to encourage innovative financial products and services that accelerate the development of pension service industry. In 2016, the value added of service industry amounted to 38422.1 billion yuan, a year-on-year increase of 7.8%, and continued to lead in the three industries. The service industry contributed to 58.2% of the growth of gross domestic product (GDP), 5.3 percentage points (pps) higher than the 2015 level.

In 2016, China's economic structure was further optimized. The shares of primary and secondary industryin total GDP were8.6% and 39.8% respectively, down by 0.2 and 1.1 pps over last year, while that of tertiary industry was 51.6%, up by 1.4 pps year on year.

(II) Conserving Energy and Improving Energy Efficiency

Strengthening target binding and policy driving. The State Council released the *ComprehensiveWork Plan for Energy Conservation and Emissions Reduction During the 13th Five-Year Plan Period*, which made an overall arrangement for energy

conservation in the five years and decomposed the targets of energy consumption cap and intensity control (double control) to provinces (autonomous regions and municipalities). The National Energy Administration (NEA) issued the *Guiding Opinions on Energy Work in 2016*, putting forward the target of controlling total energy consumption. In 2016, NDRC, entrusted by the State Council and in conjunction with relevant ministries, conducted the evaluation and appraisal of provincial government responsibility for energy conservation targets and clarified the targets of energy consumption cap and intensity in 2016 and 2017. In 2017, NDRC carried out the on-site evaluation of "double control" target completion of provincial governments in 2016. A total of 12 ministries, including NDRC, MIIT, Ministry of Science and Technology (MOST), and Ministry of Finance (MOF), jointly issued the *13th Five-Year Action Plan for Energy Conservation*, which set forth ten actions such as the promotion of energy-efficient products to advance energy conservation in various aspects and fields.

Enhancing energy efficiency management and institutional construction. In 2016, NDRC convened the coordinator meeting of the State Council Leading Group for Energy Conservation and Emissions Reduction to coordinate the work for energy conservation during the 13th FYP period. It also issued the *Measures for Energy Conservation Supervision* and the updated

Measures for Energy Efficiency Examination of Fixed-Asset Investment Projects to strengthen the supervision of energy efficiency and in-process and ex-post regulation of energy efficiency assessment. NDRC and SAC jointly developed the *Plan for Building an Energy Efficiency Standard System* to further improve the system and tighten the constraint by energy efficiency standards. In May 2016, NDRC and AQSIQ jointly released the revised *AdministrativeMeasures for Energy Efficiency Labeling*, expanding the application scope of energy efficiency labels. By the end of 2016, there are totally 35 product energy efficiency labels unveiled officially.

Pushing forward energy conservation in key areas. In 2016, the Energy Efficiency Leader program continued to implement and NDRC and AQSIQ released the catalog of energy efficiency leaders for three products, covering household refrigerators, flat-panel televisions, and speed-adjustable room air conditioners. NDRC allocated the central budget for investment to support key energy conservation projects, including comprehensive energy efficiency improvement of key energy users, energy conservation renovation of key industries, promotion of energy management contracting, urban road lighting, and comprehensive renovation of airports, stations and ports. The *Administrative Measures for Energy Efficiency of Key Energy Users* was issued, which urged the

national key energy users to implement the “Hundred/thousand/ten thousand” energy conservation actions and advance the construction of on-line energy efficiency monitoring system. The pilots of compensated use of energy and trading of energy use werealso underway. The Ministry of Housing and Urban-Rural Development (MOHURD) proceeded with the Green Building program. The Ministry of Transportation (MOT) stepped up efforts to build a modern integrated transportation system and established and improved the green transportation regulation and standard system. The National Government Offices Administration (NGOA) and NDRC jointly issued the *13th Five-Year Plan for Energy and Resource Conservation of Public Institution*, and carried out energy efficiency assessment of public institutions. 22 provinces (autonomous regions and municipalities), including Shanghai and Henan, unveiled the regional five-year plans for energy and resource conservation of public institution.

Thanks to the efforts in all sides, in 2016, China effectively controlled the total energy consumption to 4.36 billion tons of coal equivalent (tce).The annual growth of energy consumption is 1.4%, 2.2 and 5.3 pps lower than the average annual growth during the 12th and 11th FYP periods respectively. The energy consumption per unit of GDP fell by 5% year on year, exceeding the target and task set for 2016 and equivalent to the energy saving of about

230 million tce and the carbon dioxide emission reduction of about 500 million tons.

(III) Optimizing the Energy Structure

Continuing strict control over coal consumption. NDRC issued the *Circular on Improving Work to Reduce Coal Consumption by Using Alternatives in 2016*, which required strict law enforcement to slash the coal consumption of overcapacity industries, including strict control (ban) on new capacity, accelerated elimination of backward capacity and reduction of overcapacity in (potential) overcapacity industries, such as iron and steel, coal, cement clinker, plate glass, and coal power. In 2016, the Beijing-Tianjin-Hebei region implemented key projects, such as the comprehensive transformation of coal-fired boilers and the replace of coal by waste heat and geothermal energy for residential heating, in order to curtail coal consumption. The pilot scope of coal consumption reduction by using alternatives was further expanded from three key regions, i.e. the Beijing-Tianjin-Hebei region, Yangtze River Delta, and Pearl River Delta, to other regions including Liaoning, Shandong and Henan, and the project type of pilot was gradually extended from electricity projects to non-electricity projects. In 2016, China's coal consumption totaled 3.78 billion tons, a decline of 190 million tons or 4.7% over lastyear.

Promoting clean utilization of fossil fuels. The energy industries strictly followed the objectives and requirements made by the *Interim Measures for Quality Management of Commercial Coal* promulgated by NDRC, the *Guiding Opinions on Promoting Safe, Green Exploration and Efficient, Clean Utilization of Coal* promulgated by NEA and MEP, and the *Action Plan for Clean and Efficient Use of Coal (2015-2020)* promulgated by NEA, and steadily advanced the safe, clean, efficient, and low-carbon development of coal industry. NEA issued the *Recommended Catalog of Advanced Technologies and Equipment for Safe, Green Exploration and Efficient, Clean Utilization of Coal(First Batch)*. NDRC and NEA jointly issued the *13th Five-Year Plan for Coal Industry* and the annual implementation plan, which guide enterprises to increase the proportion of coal washing and selection, so as to improve the quality of commercial coal from the source. There was also rapid progress in the development and utilization of coal-bed methane (coal gas). In 2016, the coal bed methane (coal gas) production and consumption reached 17.9 billion m^3 and 8.8 billion m^3, increase of 96% and 148% compared with those in 2010 respectively. NDRC issued the *13th Five-Year Plan for Natural Gas Industry*, which defined the development objectives and key tasks for natural gas industry during the 13th FYP period. In 2016, the production and apparent consumption of natural gas attained 137.1 billion m^3 and 205.8

billion m^3 respectively and the proportion of natural gas in the primary energy consumption approached 6.4%.

Promoting the development of non-fossil fuels. NEA issued the *Guiding Opinions on Energy Work in 2016*, which proposed to further promote the energy mix adjustment and development driver conversion, in order to make a good start for energy development during the 13th FYP period. NDRC, MOF and the relevant ministries issued a notice on the trial implementation of issuance and voluntary purchase of green power certificate of renewable energy. By the end of 2016, the installed capacity and generation of hydropower rose to 330 GW and 1174.8 TWh, increasing by 3.92% and 5.58% year on year respectively. The installed capacity and generation of nuclear power rose to 33.64 GW and 213.2 TWh, increasing by 23.83% and 24.39% year on year respectively. The installed capacity and generation of on-grid wind power rose to 147.47 GW and 240.9 TWh, up by 12.79% and 29.78% year on year respectively. The installed capacity and generation of solar power rose to 76.31 GW and 66.5 TWh, up by 80.91% and 68.51% year on year respectively. All the non-fossil power, including water, nuclear, wind and solar power, accounted for 36.6% of national total installed capacity and 29.14% of national total power generation.

By taking comprehensive measures, China further optimized the energy mix in 2016, with the coal consumption continuing decreasing for three years. The percentages of coal, oil, natural gas, and non-fossil energy sources in the primary energy consumption are 62.0%, 18.3%, 6.4% and 13.3% respectively, making differences of -1.7, 0, 0.5, and 1.2 pps compared with those in 2015.

(IV) Controlling GHG Emissions from Non-Energy Activities

Verifying hydrofluorocarbons (HFCs) disposal. NDRC organized the local commissions to report trifluoromethane (HFC-23) disposed by enterprises in 2016, arranged for random third-party verification, and together with relevant ministries, implemented the relevant policies that ensures the normal operation of devices to phase out HFC-23.

Conducting statistic and accounting for fluorinated GHGs. Based on the technical training for statistic survey of fluorinated GHGs, MEP conducted the statistic and accounting of fluorinated GHGs of 113 companies in 26 provinces (autonomous regions and municipalities), and basically grasped the situation of the production, consumption, import and export, by-production and disposal of HFCs, perfluorocarbons (PFCs), sulfur hexafluoride (SF6) and nitrogen trifluoride (NF3) in China from 2013 to 2015.

Controlling GHG emissions from agricultural activities. In 2016, the Ministry of Agriculture (MOA) continued the comprehensive measures to reduce GHG emissions, which included advancing rural biogas transformation and upgrading by releasing the *Circular on Announcing the Plan of Investment within the Central Budget for Large-scale Biogas Projects in 2016*; actively promoting such fuel utilization technologies as straw pyrolysis and gasification, straw biogasification, straw curing, and straw carbonization; vigorously promoting firewood- and coal-saving furnaces, rural solar power utilization, and small-scale solar PV, small-scale wind, and micro-scale hydro power generation; and actively developing green small hydropower (SHP) by formulating the *Evaluation Criteria for Green Small Hydropower* and initiating and implementing the development of green SHP stations across the country. In addition, technological innovation and integrated demonstration for conservation tillage and the technological demonstration of energy conservation and emissions reduction in fisheries were carried out.

(V) Increasing Carbon Sinks

Increasing forestry carbon sinks. In 2016, the State Forestry Administration (SFA) revised and issued *the Outline of National Afforestation Plan (2016-2020)*, *Administrative Measures for Due*

Diligence Forms in Nationwide Voluntary Tree Planting (Trial), and *Selected Technology Modes for Arid Land Afforestation*, promulgated the *Technical Specifications for Afforestation (Revised Edition)*, *Technical Guidelines for Arid Land Afforestation*, and *National Forest Management Plan (2016-2050)*, and improved the policy documents related to technical standards for forest management. Efforts were strengthened to protect forest resources and prevent and control forestry disasters, in order to further reduce carbon emissions in forestry. Natural forests in the whole country were brought under protection with a complete ban on commercial logging. From 2016 to March 2017, totally 47.893 billion yuan of the central budget was allocated for forest protection projects. In 2016, forests were planted in an area of 7.204 million hectares and cultivated in 8.5004 million hectares. The numbers read 4.385 million hectares and 3.906 million hectares respectively in the first half of 2017.

Increasing other carbon sinks. The State Council issued the *Program for Wetland Protection and Remediation System*, accelerating the establishment of a complete system of wetland protection and remediation to enhance the function of wetland carbon sink. MOA stepped up the protection of grassland ecosystems. In 2016, the national grassland vegetation coverage reached 54.6%, 0.6 pps higher than last year.

II. Climate Change Adaptation

Since 2016, the Chinese Government has made positive progress in adapting to climate change, covering agriculture, forestry, meteorology, water resources, costal zones and related waters, urban areas and disaster prevention and mitigation, as well as capacity building.

(I) Improving Adaptation Capacity in Key Areas

Agriculture sector. In 2016, agricultural meteorological disasters occurred frequently and repeatedly in China, affecting 26.22 million hectares of crops, an increase of 4.45 million hectares over the previous year. MOA developed the *Preparatory Plan for Disaster Mitigation and Relief in a Science-based Response to El Niño to Ensure Bumper Harvest* to guide all regions to prepare in advance for disaster prevention and alleviation, and issued a handful of emergency notifications on the prevention of such disasters as floods and typhoons, arranging for flood prevention and control in the agricultural sector. MOA also actively coordinated with MOF in the provision of emergency relief funds to support post-disaster agricultural production in worst-hit provinces, covering seed and

seedling subsidies and pest disaster prevention and controlling. Water-saving irrigation techniques were actively advocated with 11 high-standard demonstration zones for water-saving agriculture established in 11 provinces (autonomous regions and municipalities) across the north, northwest and southwest regions. The continual construction of complementary system and water-saving transformation were implemented in large and key medium-sized irrigation districts. The large-scale water-saving irrigation was accelerated in different regions, such as water saving and grain growth in Northeast China, water saving and extraction reduction in North China, and water saving and efficiency improvement in Northwest China. In 2016, the high-efficiency water-saving irrigation area reached 21.82 million mu. Four batches of key counties with small-scale farmland water conservancy facilities were implemented, achieving full coverage of all large agricultural counties. Dry farming techniques were also widely promoted, such as mulching, drip irrigation under mulch, and water-fertilizer integration. The *Implementation Plan for Promoting Water and Fertilizer Integration (2016-2020)* was issued to coordinate and fully promoted the work of water-fertilizer integration. The technological innovation and integrated demonstration of conservation tillage were carried out to promote the application of conservation tillage technologies. In 2016, the incremental area of conservation tillage reached 12 million

mu, mechanical no-till planting 9 million mu, and mechanical straw recycling 45 million mu, and the mechanical subsoiling area reached 150 million mu.

Water resources sector. The Ministry of Water Resources (MWR), in conjunction with NDRC and relevant ministries, completed the assessment of the most stringent water management system during the 12th FYP period, covering all the 31 provinces (autonomous regions and municipalities). The *Action Plan for Water Consumption Cap and Intensity Control During the 13th Five-Year Plan* was issued, kicking off the dual control of water consumption. The *13th Five-Year Plan for Building a Water-Saving Society* was completed toclearly explicate the overall idea, regional layout, key tasks and key fields for the construction of water-saving society during the 13th FYP period. The *National Action Plan for Water Conservation* was released, proposing ten key water-saving actions such as agricultural water-saving for production increase, industrial water-saving for efficiency improvement, and urban water-saving for consumption reduction. Together with NDRC, MIIT, and other four ministries, MWR issued the *Implementation Plan for Water Efficiency Leader Program,* deploying the implementation in irrigation areas, water-using enterprises and water-using products. MWR also issued the *Guidelines for Evaluation of Water Eco-cities* and *Key Technologies of Water Ecosystem Protection and*

Restoration and the Application, which supported the implementation of 62 water system connectivity projects involving more than 200 rivers and lakes. The *Technical Guidelines for River-Lake Water System Connectivity Projects* was completed to provide guidance for project implementation at the local level.

Forestry and ecosystems. SFA unveiled the *Action Plan for Forestry to Adapt to Climate Change (2016-2020)* to step up efforts of climate change adaptation in forestry sector. MOA formulated the *Rehabilitation Plan for Farmland, Grassland, Rivers and Lakes (2016-2030)* and the *13th Five-Year Plan for Grassland Protection, Construction and Utilization*, and issued the *Work Plan for Promoting the Grassland Protection System*, so as to implement the special rectification of nationwide grassland ecological environment and further put in place the system of grassland grazing ban and grass-livestock balance. The policy of subsidingand rewarding grassland ecological protection was carried out, with a new round of subsidy andreward for grassland initiated in 13 provinces including Inner Mongolia, Xinjiang Production and Construction Corps, and Heilongjiang Land Reclamation Bureau. Grassland restoration projects were implemented to establish grassland fences in 2.334 millionhectares and improved 173 thousand hectares of degraded grasslands. The Beijing-Tianjin sandstorm source control project was implemented in Hebei, Inner

Mongolia and other three provinces (regions), treating 201 thousand hectares of grasslands. The comprehensive rocky desertification treatment project was conducted for the grassland development in karst regions, covering Chongqing, Guizhou and other five provinces (cities). The campaigns of promoting modern grassland animal husbandry in south regions were launched in Sichuan, Yunnan and other eight provinces, in order to protect and improve the grassland ecological environment in the southern region.

Coastal zones and related sea waters. The State Oceanic Administration (SOA) strengthened the planning and examination of sea use by construction projects and regions, and strictly restricted the occupation of important marine eco-spaces, including key eco-redlined areas such as key sea bays and important coastal wetlands and natural shorelines. As of July 2017, about 260 marine protected areas of different kinds were established at all levels, with a total area of over 120 thousand km^2, accounting for 4.13% of the total sea area under China's jurisdiction. SOA issued the *Guiding Opinions on Strengthening Coastal Wetland Management and Protection* and, together with MOF, implemented the blue gulf remediation and restoration program tosupport the coastal wetland restoration in Dalian and other 17 cities. Ten eco-island projects were implemented in such regions as Liaoning, Zhejiang, Fujian,

Guangdong and Guangxi, effectively beefing up island infrastructure for disaster prevention and alleviation and built up island resilience to climate change.

Urban areas. NDRC and MOHURD jointly released the *Action Plan for Urban Adaptation to Climate Change* to coordinate the work and enhance the capacity building of climate change adaptation on city level. This was followed by active explorations in all regions across the country. The China Meteorological Administration (CMA) continued to work with MOHURD in the assessment of urban rainstorms while adding revised rainstorm formulas and rainstorm profiles for 146 cities; conducted impact assessment of extreme events; issued the *Outline of the Construction of Urban Meteorological Disaster Prevention and Mitigation System and Public Weather Service System*; and carried out urban waterlogging risk survey in 3,290 risk sites.

Meteorological sector. CMA carried out a nationwide meteorological disaster risk census covering all regions and counties, which completed the hazard survey and data collection of 5,425 rivers, 19,279 torrent ditches, 11,947 mudslide sites and 57,597 landslide risk sites, the flood/flash flood hazard mapping and its application covering over one-third of medium and small-sized rivers, and the phase-I construction of

information management system and the establishment of a unified management database for meteorological disaster risk. Meteorological disaster risk warning services were provided in 2,175 counties. Eco-meteorological monitoring and evaluation services were implemented, which completed dynamic estimates of national grassland vegetation productivity, forage yield, and ecological quality in 2016. The capability on environmental meteorology service was improved gradually by establishing regular weather condition assessment services against air pollution, and organizing the research on environmental meteorology index. The *National Meteorological Bulletin on Atmospheric Environment* was compiled and the work on emissions reduction assessment and heavy pollution weather forecast was carried out.

Disaster prevention and alleviation. The CPC Central Committee and the State Council issued the *Opinions on Promoting the Reform to Systems and Mechanisms for Disaster Prevention, Mitigation and Relief* and the General Office of the State Council issued the *National Comprehensive Disaster Prevention and Mitigation Plan (2016-2020)*. The *Work Procedures for Emergency Relief* was revised to further regulate and improve the work on natural disaster relief and the emergency response procedure at the central level. From 2016 to May 2017, the National Disaster Reduction Committee launched together with MCA 29 times of disaster

emergency responses, allocated central relief supplies to disaster-stricken areas, including 54 thousand tents, 185 thousand blankets, 21 thousand cotton coats, 30 thousand sleeping bags and 66 thousand folding beds, and completed the resettlement of emergency transferring people by 11.93 million person-times. MCA put into effect the *Guiding Opinions on Supporting and Guiding the Participation of Social Forces in Disaster Relief* to explore the public-participation mechanism for disaster relief, and began to create the social force database and information platform which has covered the information of 20 national social organizations and 633 local social organizations to date. A series of six special training sessions for disaster relief were organized and more than 440 employeesfrom social organizations and civil affairs departments were trained.

(II) Enhancing Capacity Building

Intensifying infrastructure construction. The backbone projects for river governance were strengthened. By July 2017, a total of 109 key water conservancy projects for water conservation and supply were started, a number of landmark projects accelerated, including Datengxia (West River), Chushandian (Huaihe River), Shaanxi (Hanjiang River and Weihe River), and Laluo (Tibet), and a group of key projects completed and put into operation, such as

Hekou Village (Henan) and Xiajiang (Jiangxi). Flood control that highlighted the weak links was strengthened. In 2016, totally 238 large and medium-sized dangerous reservoirs (gates) were reinforced and the important sections of 55 major tributaries and over 300 small rivers treated. The flash flood monitoring and warning system and group monitoring and prevention system were improved with the treatment of 70 key torrent ditches, which largely reinforced the weak link for flood control. There was also an improvement in the safeguard system for relief supplies. MCA, NDRC and MOF coordinated and implemented the project of national material reserve system for disaster relief. Nine national-level warehouses, distributed in Shenyang, Harbin, Hefei, Wuhan, Changsha, Chongqing, Lhasa, Golmud and Urumqi, were put into use. The construction of material reserve warehouse for disaster relief in 114 disaster-prone cities and counties was supported for the first time. In 2017, the project of disaster relief material reserves was implemented to support the construction of 13 city-level warehouses and 152 county-level warehouses. The capacity building was enhanced for grassland disaster prevention and alleviation. By the end of 2016, MOA has implemented 1national information system project for grassland fire prevention, established 36 command centers for grassland fire prevention, 79 material reserve warehouses for grassland fire prevention, 308 material supply stations for grassland fire prevention and 7

grassland fire monitoring stations, as well as expanded about 3,000 km of grassland fire isolation belts on the border.

Establishing monitoring and warning mechanisms. MWR issued the *Circular on Good Work to Establish a National Monitoring and Warning Mechanism for Water Carrying Capacity*, proposing to basically establish a monitoring and warning mechanism on county-level water carrying capacity in about three years. The accountability system for flood and drought control, with the local administrative leader responsibility as the core, was improved at all levels. MWR perfected the River Flood Control Plan, Flood Dispatching Plan, and Emergency Water Dispatch Plan and initially built a national drought monitoring system which encompasses 1,021 automatic and manual monitoring sites. The National Health and Family Planning Commission (NHFPC) started to monitor the human health impact of hazy weather, which covering 126 monitoring sites of 60 cities in 2016 and 150 sites of 74 cities in 2017. The pilot of monitoring health hazard factors in public places was launched in selected cities of 31 provinces (autonomous regions and municipalities), focusing on sources of indoor air pollution ($PM_{2.5}$ and etc.) and their effects on health in crowded public places. Maritime monitoring and pre-warning were strengthened. In 2016, SOA carried out the pilot monitoring of ecosystem response to climate change in the north Yellow Sea and

the sea areaof south Dalian, which laid the foundation for monitoring and evaluating the response of marine ecosystems to climate change in the country.

Enhancing scientific and technological support. The integrated climate observing system was improved and the construction of national climate observatory advanced. The global carbon dioxide monitoring satellite for scientific experiment was successfully launched in December 2016. The applied research and demonstration of Beidou satellite navigation system and high-resolution Earth observation system, a major national science and technology project, proceeded efficiently in the field of disaster reduction. NHFPC organized the climate change related research studies, including the impact of climate change on health and adaptation mechanism, and the assessment and predict of population health risk due to climate change. SOA conducted the research projects such as the Study and Application Demonstration of Key Technologies for Dynamic Monitoring of Land-based Carbon Storage in the Sea Based on Remote Sensing and Field Comparison to strengthen the dynamic monitoring of terrestrial carbon into the sea. The Chinese Center for Disease Prevention and Control (CDC) organized a project of climate change adaptation and human health protection and established an early pre-warning system for heat waves and health risks in pilot cities. MCA

implemented a batch of projects under the 863 Program, Science and Technology Program and Natural Science Foundation of China (NSFC) Program, and achieved many key technological breakthroughs and national patents.

III. Local and Industry Action and Social Participation

Since 2016, China has deepened the low-carbon province and city pilots, steadily advanced the pilots of low-carbon industrial parks, low-carbon communities and low-carbon cities (towns). All regions and sectors including industry, building and transportation sector have actively explored the path and mode of low-carbon development at different levels and in different fields. The awareness of addressing climate change and promoting low-carbon development has been increased across the whole society.

(I) Carrying Out Pilots and Demonstrations

Deepening the low-carbon province and city pilots. NDRC summarized and assessed the experience in the first two batches of low-carbon province and city pilots. The results showed that the

pilot provinces and cities took the initiative ahead in the low-carbon development and conducted the relevant work according to local conditions in an innovative manner. They spearheaded the implementation of major national low-carbon policies by formulating a group of replicable and extendable experiences and practices from the perspective of enhancing organization and leadership, fulfilling low-carbon concept, exploring institutional innovation, completing supportive policy, establishing market-based mechanism, improving statistical system, strengthening assessment and evaluation, coordinating pilot and demonstration, and conducting exchanges and cooperation. Some pilot regions launched the pilot of emissions trading, low-carbon industrial park, low-carbon city (town), and low-carbon product certification.Most of pilot cities set the target of peaking carbon emissions and sought for pathway to decouple the economic development with carbon emissions. In January 2017, NDRC determined to conduct the third batch of low-carbon city pilots in other 45 cities (districts and counties), increasing the total number of low-carbon pilot provinces and cities to 87.

Steadily advancing the low-carbon community pilots. Manyprovinces (autonomous regions and municipalities) conducted the low-carbon community pilots. As of July 2017, more than 400 provincial-level low-carbon pilot communities were

established in 27 provinces, most of which completed the working plan for pilot implementation.

Carrying out the climate adaptation city pilots. In February 2017, NDRC and MOHURD launched the pilot of climate adaptation cities and identified 28 regions as pilots, taking into account climate types, regional characteristics, development stage and existing working basis of these regions. The key tasks of the pilot are determined, including strengthening the city adaptation concept, improving monitoring and warning capability, taking key adaptation actions, creating policy test bases, and building international cooperation platforms.

Actively pushing forward other pilot and demonstration. Large energy enterprises continued technological research, pilot and demonstration of carbon capture, use and storage (CCUS). China Resources (CP) Co., Ltd and Guangdong CCUS Center jointly launched the carbon capture testing platform project in Haifeng power plant of CR Powerin March 2017. NDRC (Department of Climate Change) and ADB signed the *Memorandum of Understanding on Technical Assistance to Develop a Large-scale Carbon Capture, Use and Storage Project in China*, according to which ABD will provide a grant of 5.5 million US dollars to support the capacity building for the Joint Engineering Research

Center at Northwest University, and feasibility study for Yanchang CCUS project with the annual capture capacity of 100 million tons of carbon dioxide. The demonstration projects of near-zero carbon emission area were also explored in many regions. Shaanxi government issued the *Notice on Carrying out the Pilot on Demonstration Projects of Near-zero Carbon Emission Area* and Guangdong government the *Implementation Plan for Demonstration Projects of Near-zero Carbon Emission Area*. The Department of Climate Change of NDRC conducted the preliminary survey and study of the working program for demonstration projects of near-zero carbon emission area. MOT issued the *Guiding Opinions on the Construction of Green Road* and implemented three batches of typical demonstration on green road construction. The emission control area for vessels were firstly set in the Yangtze River Delta and the pilot of liquefied natural gas (LNG) powered vessels was carried forward, and 9LNG pilot projects were announced in the water transportation industry. SOA actively organized scientific research, international exchange and pilot exploration of blue carbon sinks of oceans.

(II) Local Action for Addressing Climate Change

Formulating low-carbon planning. Zhejiang Province released its *13th Five-Year Plan for Low-carbon Development*, whichput

forward the overall objective for the five years, i.e. increasing low-carbon development level remarkably, improving low-carbon mechanism gradually, and formulating low-carbon production and lifestyle basically. Hunan Province issued the *Five-Year Action Plan for Low-Carbon Development (2016-2020)*, further clarifying the targets and tasks of low-carbon development in the five years. Yunnan Province issued the *Low-carbon Development Plan (2011-2020)*, organized 16 prefectures (cities) to complete and officially release the low-carbon development plans, decomposed the quantitative targets in the provincial plan and entailed responsibilities to the prefectures (cities), and carried out the annual evaluation of prefectures (cities) governments in achieving low-carbon development targets.

Fulfilling emissions control targets. Beijing, Shanghai, Tianjin, Chongqing and Gansu announced the year of peaking carbon emissions in their 13th five-year plan to address climate change or working plan for GHG emissions controlling. 21provinces (cities) of the first two batch of low-carbon province and city pilot released the year of peaking carbon emission through other official channels. 45 cities of the third batch of low-carbon city pilot put forward the year of peaking carbon emission in the working plan submitted for pilot application. Shanghai put forward the clear target of total carbon emission controlling in its 13th FYP plan, and decomposed

the target in a way of "integration of departments and regions".

Reinforcing fundamental capacities. All of 31 provinces (autonomous regions and municipalities) carried out the compilation of GHG inventory for 2012 and 2014 upon the full completion of preparation and acceptance of the 2005 and 2010 inventories. Among them, Zhejiang Province established a mechanism of regular compiling of GHG inventory at the provincial, city and county levels, and completed the preparation and acceptance of provincial and municipal inventories from 2005 to 2014, and the compilation of inventories from 2010 to 2015 in 11 cities with districts and all counties (districts, cities).

Enhancing legislation on local level. Shijiazhuang in Hebei Province sought to promote low-carbon development through legislation. The *Regulations of Shijiazhuang City on Promotion of Low-carbon Development* was passed at the city people's congress in January 2016, approved by the provincial people's congress in May, and put into effect on July 1st, 2016. In Nanchang, Jiangxi Province, the *Regulations on the Promotion of Low-carbon Development* was examined and adopted at the city people's congress in April 2016 and took into effect on September 1st, 2016.

Strengthening international cooperation and exchanges. Since recent years, many provinces and cities fostered active cooperation

and exchanges with foreign counterparts in the field of climate change and low-carbon development. Zhejiang became actively involved in the South-South cooperation on climate change and established a "1+X" training mode for South-South cooperation. Beijing successfully hosted the Second China-US Climate-smart / Low-carbon Cities Summit. Wuhan City successfully held the First China-EU Low-carbon Cities Conference. Hunan Province held the First Asia-Pacific Summit on Low-carbon Technology. Zhenjiang City, Jiangsu Province, hosted the First International Trade Fair for Low-carbon Technologies and Products. Shenzhen City hosted the Fourth International Low-carbon City Forum. The Department of Climate Change of NDRC launched the research on Low-carbon City Cooperation under the Framework of the Belt and Road Initiative.

(III) Low-Carbon Action in Sectors

Low-carbon actions in industrial sector. MIIT promulgated and issued the *Green Development Plan for Industry (2016-2020)* to promote the formation of a green manufacturing system and accelerate the low-carbon transformation of the industrial sector. The *Implementation Plan for Green Manufacturing Program 2016* was issued, which clarified the key tasks to implement the green manufacturing program 2016, and with a focus on green

renovation and upgrading, required accelerating the development and commercialization of key technologies, strengthening the pilot and demonstration and green supervision, and actively building a green manufacturing system. The national pilot of low-carbon industrial parks was deepened by increasing the number of industrial park pilots and continuing the establishment of national low-carbon industrial park demonstration.

Low-carbon actions in transportation sector. MOT issued the *Implementation Plan for Controlling Greenhouse Gas Emissions in the Transportation Industry During the 13th Five-Year Plan Period*, which put forward the general requirements and main objectives for the control of GHG emissions from the transportation sector in the five years. The *Work Highlights of Transportation Energy Conservation and Emissions Reduction in 2017* was issued to raise the requirements and tasks for green low-carbon development, ecological construction, GHG emission controlling, and energy conservation and emissions reduction in the transportation sector. The *Implementation Plan for Promoting Ecological Civilization in the Transportation Sector* was unveiled, which set forth the objectives and requirements for the transportation sector toward 2020 in terms of transportation structural optimization, transportation infrastructure green construction and operation technologies, clean transportation, as well as ecological civilization

system and standard system for transportation sector. The *System of Green Transportation Standards (2016)* was released, encompassing 221 green transportation standards. The green transportation organization mode such as drop and pull transportation and multimodal transportation were applied deeply and the intermodal transportation modes such as rail-water, road-rail, and land-air transportation were orderly advanced. The proportion of railway in transportation was increased to fully taking its comparative advantages. The work on energy consumption accounting and monitoring of transportation was carried out in such cities as Beijing, Handan, Jiyuan, Changzhou, Nantong and Huai'an.

Low-carbon actions in building sector. MOHURD issued the *13th Five-Year Plan for Construction Industry*, clarifying the requirements and objectives of low-carbon development for the construction sector in the five years. Low-carbon technologies were promoted according to the local conditions and the green construction and housing industrialization mode were spread. The pilot and demonstration of green eco-towns and zero-emission buildings was carried out actively. The State Council issued the *Guiding Opinions on Further Strengthening the Management of Urban Planning and Construction*, calling for increasing building energy efficiency standards and promoting green buildings and

building materials, and for the first time, explicitly advocating the development of passive buildings at the national level.

(IV) Broad Social Participation

Through government guidance, broad publicity via diverse media and active business and public participation, the awareness of addressing climate change and promoting low-carbon development was greatly enhanced and a low-carbon development mode featuring the common concern and full participation of the whole society has gradually taken shape in China.

Enhanced government guidance. In 2016 and 2017, NDRC together with relevant ministries continued the activities of National Energy Conservation Week and Low-Carbon Day, which showcased government and community actions and achievements in low-carbon development and disseminated the concept of low-carbon development. CMA strengthened science advocacy and publicity on climate change on the occasions of World Meteorological Day, Disaster Prevention and Reduction Day, and Beijing Science Week, and made multilingual videos and brochures entitled *ToAddress Climate Change - China in Action (2016)* and the special issue of *Climate Change News - Echo of Marrakech*. MCA held special seminars in 2016 on emergency relief for county-level leading cadres to strengthen their emergency response

and decision-making capabilities; implemented the disaster reporter training program, which trained more than 880 persons qualified to teach in Beijing and tens of thousands of disaster information officers at local level; coordinated community mitigation activities with guidance provided on the establishment of 1,455 Demonstration Communities for National Comprehensive Disaster Reduction, and organized publicity and education activities during the National Disaster Prevention and Reduction Day and the International Day for Disaster Reduction. MOT carried out "Bus Travel Week" activities with the theme of "Preferred Green Public Transportation", in a bid to create a good social atmosphere to understand, respect, support and select public transportation, and actively guide public participation in the development of urban public transportation. NGOA was active in energy conservation publicity and training by providing remote online or face-to-face training to energy managers of all kinds at all levels. The national departments and public institutions played a leading role in energy conservation and low carbon. In 2016, the per capita energy and water consumption of public institutions decreased by 2.38% and 2.02% year on year respectively, and the energy consumption per unit of building area of public institutions fell by 1.64% year on year. SOA presented the work on addressing climate change in the marine sector through “China Marine and Climate Change Information Network” and disseminated scientific

knowledge during the "6.8 World Oceans Day" annually.

Extensive media publicity. People's Daily, Xinhua News Agency, and China Central Television (CCTV) presented the TV series "Endeavoring to Move Forward in the Past Five Years" and the special column "Green Development, Green Life" to report the cases of ecological civilization and green development in provinces and cities. With the guidance of the CPC Publicity Department, CCTV filmed the documentary called "Carrying the Reform through to the End" and made clear in "Safeguarding Clean Waters and Green Mountains" that "China will continue to be a party of action to address climate change as always". The scientific knowledge of climate change was disseminated through nearly 800 episodes of TV programs broadcasted in TV channels such as CCTV and propelled via new media, such as Internet Plus, Weibo and WeChat. In 2017, the Second China (Shenzhen) International Climate Film and Television Conference with the theme of "Climate Change and Green Communication" washeld in Shenzhen to disseminate knowledge of climate change.

Proactive enterprise actions. Chinese enterprises have thoroughly implemented national policies related to climate change, energy conservation and emissions reduction to promote low-carbon transition and green development. Proactive efforts were made to

optimize the industrial structure. For example, the China Baowu Steel Group Corporation successfully accomplished the targets of coal control assigned by Shanghai government and the China Petroleum and Chemical Corporation actively promoted energy management contracting. Energy conservation was prioritized. For instance, the centrally administered power enterprises actively upgraded and transformed coal-fired generating units, and the petroleum and petrochemical enterprises continued to improve energy management. The research and development of low-carbon technologies was advanced, such as the major scientific and technological study on key low-carbon technologies conducted by petroleum and petrochemical enterprises, and the CCUS technology research and engineering application carried out by power companies. The fundamental capacity building for tackling climate change also made steady progress. For example, the China Mobile Communications Corporation established the carbon emissions accounting system in accordance with the requirements for information disclosure.

Broad public participation. With the steady development of education and publicity on climate change, the public has proactively chosen low-carbon lifestyle such as low-carbon transportation and housing, and put the concept of low-carbon development into action. *The Report on the Work of the*

Government (2016) proposed to "boost the development of a sharing economy through institutional innovations, and create sharing platforms". The sharing economy has penetrated into the various aspects of public life, such as bike sharing and car rental, offering efficient solutions for low-carbon public transportation. In 2016, The Climate Group and the Aihuishou organization co-sponsored the action to encourage the public to actively dispose idle or used electronic products in an environment-friendly way and use resources in a circular and efficient manner. The China Center for Climate Communication organized the second national survey of public awareness on climate change, and the results showed a notable improvement in the conscious actions of the public to deal with climate change. 96.8% of the respondents supported the Chinese Government to carry out international cooperation in the field of climate change, 95% adopt mitigation policy measures, and 96.9% control the total carbon dioxide and other GHG emissions, and 98.7% of the respondents supported schools to enhance climate related education.

VI. Planning Formulation and System Construction

Since 2016, the Chinese Government has accomplished positive achievements through efforts on strengthening planning, improving schemes and mechanisms, enhancing laws, regulations and standards, promoting carbon emission trading system, and boosting green low-carbon finance.

(I) Strengthening Planning

Formulating and issuing the Work Plan for Controlling Greenhouse Gas Emissions During the 13thFYP Period. In October 2016, the State Council issued *the Work Plan for Controlling Greenhouse Gas Emissions During the 13th Five-Year Plan Period* in order to boost green low-carbon development, ensure the completion of objectives and tasks of low-carbon development defined in the *13th FYP Outline*, and lay a solid foundation for peaking carbon dioxide emissions around 2030 and striving to peak early. The work plan explicitly stated that provinces (autonomous regions and municipalities) shall incorporate the drastic reduction of carbon dioxide emissions intensity into the local economic and social development plans, annual plans and

government work reports, and draw up the specific work plans. All provincial governments put efforts in formulating their work plans for controlling GHG emissions according to local conditions, in order to promote the achievement of carbon intensity controlling targets and implement measures and policies for controlling GHG emissions. As of June 2017, totally 18 provinces (autonomous regions and municipalities) released such work plans or plans for the control of GHG emissions during the 13th FYP period.

Strengthening planning for addressing climate change in different areas. MIIT promulgated the *Green Development Plan for Industry (2016-2020)* to accelerate ecological civilization construction and promote green development of the industrial sector. NDRC and NEA unveiled the *Energy Production and Consumption Revolution Strategy (2016-2030)* and the *13th Five-Year Plan for Energy Development*, providing overall planning for energy development in the five years. NDRC released the *13th Five-Year Plan for Renewable Energy Development*. NEA released the *13th Five-Year Plan for Energy Technology Innovation*, as well as the 13th five-year plans for solar power, wind power, oil, natural gas, and coal industries. MOHURD unveiled the *13th Five-Year Plan for Building Energy Efficiency and Green Buildings* to push forward supply-side structural reform in urban and rural housing and development. MOST, MEP and CMA jointly

developed and published the *Special Plan for Scientific and Technological Innovation to Address Climate Change During the 13th Five-Year Plan Period*. SFA issued the *Highlights of the Action to Address Climate Change in ForestryDuring the 13th Five-Year Plan Period* and the *13th Five-Year Plan for Forestry*, and studied and formulated the *Provincial Work PlanforAddressing Climate Change in Forestry During 2017-2018.*

(II) Improving Schemes and Mechanisms

Improving governing bodies. In 2016, the 3rd term of National Climate Change Expert Committee was set up, comprising of 42 members in the fields of atmosphere, oceans, hydrology, geology, ecology, forestry, energy, transportation, building, economics, law and international relations. It continued the work related to the low-carbon development strategy toward 2050, carbon market mechanism and construction, green low-carbon development pattern, climate change science and policy study, etc. Professional research agencies on climate change and low-carbon development were continuously improved at provincial and city levels, contributing to the formulation of climate change research system. Provincial leading groups for climate change were formed in 30 regions. Climate change departments or offices were established or branched to other departments under the Development and

Reform Commission of 29 provinces (autonomous regions and municipalities). Many supporting agencies were founded independently or within universities, research institutions and public institutions in 14 regions such as Beijing, Zhejiang, and Guangdong.

Strengthening target-oriented responsibility assessment. The *Work Plan for Controlling Greenhouse Gas Emissions During the 13th Five-Year Plan Period* required strengthening the evaluation and assessment of provincial governments on GHG emissions control and establishing an accountability system. NDRC formulated and issued the *Measures for Assessment of Provincial Government Fulfillment to Control Greenhouse Gas Emissions During the 13th Five-Year Plan Period*, andorganized the 2016 assessment of 31 provinces (autonomous regions and municipalities). In line with the assigned targets of carbon intensity controlling by nationalgovernment, all provincial governments formulated the assessment measures and work plans, including setting reasonable annual targets and completing annual self-assessment. In July 2016, the NDRC organized several working groups to carry out on-site assessment on governments of provinces(autonomous regions and municipalities), and the assessment results were informed to the governments and relevant departments of all provinces(autonomous regions and

municipalities), which were used as an important indicator for the comprehensive evaluation of provincial government and department leaders and leading groups, the reward and punishment of officials, as well as the tenure and appointment examination of leaders. 29 pilot low-carbon provinces or cities broke down the objectives and tasks of controlling GHG emissions to sub-regional districts and counties, wherein 22 conducted the assessment. By doing this, the responsibility of achieving GHG emission control target was strengthened and transferred to the governments at the basic level, and a regulatory working mechanism of level-by-level fulfillment of target-oriented responsibility was formed gradually.

(III) Enhancing Laws, Regulations and Standards

Promoting climate change related legislation. The *Climate Change Law* and the *Regulations on Carbon Emissions Trading Administration* were included in the "Research Projects" and "Preparatory Projects" of the *Annual Legislative Program of the State Council 2016*. In line with the legislation plan and task allocation, the special study on climate change legislation was deepened, the laws drafted, and the views of all stakeholders solicited on the draft of the *Regulations on Carbon Emissions Trading Administration*. China strengthened international cooperation and exchanges and expand international influence in

the field of climate change legislation through the bilateral cooperation mechanisms with Germany, France and Britain and the multilateral cooperation platforms with the United Nations and other organizations. Shijiazhuang City and Nanchang City respectively issuedthe *Regulations on Promotion of Low-Carbon Development* to accelerate the local legislation process for low-carbon development.

Improving standard and labeling system. By the end of 2016, NDRC has registered 200 project-based carbon emission reduction accounting methodologies in 12 batches, covering several key sectors such as industry, power, energy, building and agriculture sectors. The Certification and Accreditation Administration (CNCA) released the *General Norms for Organization of Greenhouse Gas Emissions Verification*. In 2016, NDRC, AQSIQ and CNCA jointly issued the second-batch catalog of low-carbon product certification, adding three new products including building ceramic tiles (plates), tires, and textile fabrics. The General Office of the State Council issued the *Opinions on Establishing a Uniform Standard, Certification and Labeling System for Green Products*, suggesting combining low-carbon, eco-friendly, and organic product certificate into one unified certification of green products. AQSIQ actively strived for and took leading role of many climate-change-relate technical institutions under the ISO.

(IV) Enhancing Carbon Emission Trading System

National carbon emissions trading market. In January 2016, NDRC issued the *Circular on Making Improvements to Key Work Related to the Launch of the National Carbon Emissions Trading Market* to organize local governments, relevant departments, industry associations and state-owned enterprises to implement the key work related to the launch of national carbon market, which included accounting, reporting and verification of historical carbon emissions of covered enterprises, cultivation and selection of third-party verification units, capacity building of stakeholders, etc.. In 2017, the Legislative Affairs Office (LAO) of the State Council, in conjunction with NDRC, continued the legislative review of the *Interim Regulations on Administration of Carbon Emissions Trading*. NDRC organized the drafting of the *Administrative Measures for Carbon Emissions Reporting of Enterprises* and *the Administrative Measures for Third-Party Verification Units of Carbon Emissions*; designed and improved allowance allocation methodology and completed the tentative calculation of allowances for some enterprises in power generation, electrolytic aluminum and cement sectors; evaluated and selected agencies to undertake the construction, operation and maintenance of the national registry and trading system for carbon emission; studied the promotion of reformation of Clean

Development Mechanism (CDM) and voluntary GHG emissions reduction trading mechanism.

Carbon emissions trading in the pilot and non-pilot regions. Since launched by NDRC in 2011, the carbon emissions trading pilotshavemade steady progress in seven provinces and cities, namely Beijing, Tianjin, Shanghai, Chongqing, Guangdong, Hubei and Shenzhen, through which a full-fledged and large-scale carbon emission trading pilot market with distinct characteristics has taken the initial shape. As of September 2016, the seven pilot carbon markets covered nearly 3,000 key enterprises from more than 20 industries and traded 197 million tons of carbon dioxide equivalent (tCO_2e), involving a total turnover of about 4.516 billion yuan. Currently, 3-4 rounds of compliances with emission trading allowance have been completed, showing its effect on emission reduction primarily. In addition, Fujian released the *Interim Measures on Administration of Carbon Emissions Trading in Fujian Province* in September 2016, which covered 227 enterprises from 9 industries, such as electric power, petrochemicals, aviation and ceramics, and officially initiated its carbon market in December 2016, with the trading volume of 786.3 thousandtons and turnover of 18.2265 million yuan on the first day.

Voluntary GHG emissions reduction trading. NDRC issued the

Administrative Measures for Voluntary GHG Emissions Reduction Trading and conducted the revision of guidelines for assessment, approval and verification of voluntary GHG emissions reduction trading projects. By March 2017, China has developed 198 methodologies for voluntary GHG emissions reduction, accredited 12 institutions to assess and approve voluntary GHG emissions reduction projects and verify voluntary GHG emissions reduction, as well as accumulatively disclosed 2,871 approved voluntary GHG emissions reductionprojects and 1,315 registered projects. As of December 2016, the national registry for voluntary GHG emissions reduction trading was connected with the carbon emissions trading platforms of seven pilot areas, Fujian and Sichuan, with the cumulative trading volume of voluntary GHG emissions reduction reaching 81.11 million tCO_2e and cumulative turnover about 720 million yuan.

(V) Boosting Green Low-Carbon Finance

Enhancing policy system design. The *Work Plan for Controlling Greenhouse Gas Emissions During the 13th Five-Year Plan Period* put forward "supporting the efforts on climate change and low-carbon development by introducing comprehensive policies, improving climate investment and financing mechanisms, giving into play the role of the China Clean Development Mechanism

Fund, and actively using the public-private partnership (PPP) mode and green bonds", and proposed to "carry out the climate investment and financing pilot which focuses on investment policy guidance and financial support enhancement" during the 13th FYP period. PBC, MOF, NDRC, MEP, CBRC, CSRC and CIRC jointly issued the *Guiding Opinions on Building a Green Financial System*, fully starting the construction of Chinese green financial system and policy framework. The G20 Green Finance Study Group was set up, which put green finance in the G20 Summit Agenda and completed the *G20 Green Finance Synthesis Report* for the first time. The exploration of green finance was active at the local level. The Shanghai Stock Exchange and the Shenzhen Stock Exchange issued the respective notice to carry out the pilot of green corporate bonds and advance the pilot of green bonds; Inner Mongolia explored the establishment of local environmental fund; and Shanghai Pudong Development Bank successfully issued China's first green financial bonds.

Putting policy functions into effect. In 2017, the 176thState Council Executive Meeting examined and adopted the Integrated Plan to create pilot zones for green finance reformation and innovation in five provinces (autonomous regions), namely Zhejiang, Jiangxi, Guangdong, Guizhou and Xinjiang. CSRC published the *Guiding Opinions of China Securities Regulatory*

Commission on Supporting the Development of Green Bonds to guide the exchange-dominated bonds market to further serve the green industry. PBC, CBRC, CSRC, CIRC and SAC jointly released the *Plan for Building and Developing a Standard System of Financial Industry (2016-2020)*which focused on promoting the standardization of green finance. NDRC actively conducted studies on climate financing pilot, and cooperated with CBRC to revise the *Green Credit Statistical System*, which intended to include "low-carbon credit" into green statistics, establish the classification and statistical system for low-carbon credit projects, and improve the environmental benefit measurement methodologies.

V. Fundamental capacity building

Since 2016, the Chinese Government has further improved the fundamental capabilities to address climate change by improving statistical and accounting system, enhancing low-carbon technological research, development and application, and strengthening personnel and disciplinary development.

(I) Improving GHG Statistical and Accounting System

Improving the basic statistical system for GHG

emissions. NDRC and NBS built the climate change statistical indicator system and green development indicator system, established and improved relevant investigation systems and formulated regular working mechanisms. NDRC organized the study of non-carbon-dioxide GHG emissions and policies and actions in China; and organized capacity building seminars on carbon intensity calculation at the local level to improve capability of provincial agencies in calculating and analyzing the change of carbon intensity. Full-time personnel were designated to take charge of statistical and accounting work related to climate change in the statistics departments of 27 provinces (autonomous regions and municipalities). The financial support was provided to support climate related statistical work in 21 provinces (autonomous regions and municipalities). The *Study on China's Basic Statistical System for Greenhouse Gas Emissions and Capacity Building* was published. The *China's Climate Change Data Handbook (2016)* was compiled and issued by the National Center for Climate Change Strategy and the International Cooperation (NCSC).

Advancing GHG inventory compilation and emissions accounting. Based on the first and second national communication on climate change, NDRC initiated the compilation of the 2012 GHG inventories of energy activities, industrial processes, agricultural activities, land-use change and forestry, and waste

disposal, and completed the *General Report on China's National GHG Inventory (2012)* by extensively discussing with the members of Leading Group and experts in relevant areas. On the basis of such research outcomes as national GHG inventories, the *First National Communication on Climate Change of the People's Republic of China* (in Chinese and English) was compiled and formally submitted to the secretariat of United Nations Framework Convention on Climate Change (UNFCCC) in 2017.25 provinces (autonomous regions and municipalities) compiled the provincial GHG inventories and 17 regions compiled the city/district-level GHG inventories.

Constructing reporting system for corporate GHG emissions data. NDRC organized NCSC and relevant institutions to implement the Project of "Study and Construction of Reporting System for Corporate Greenhouse Gas Emissions Data ", which completed the system study, framework design and platform software development for the reporting of corporate GHG emissions data in China, and supported the data reporting and management of corporates involved in the carbon emissions trading system. More than 400 enterprises from Henan, Xinjiang and Hainan have submitted data in the reporting system, which helps operate and test the functions of all modules in the reporting system and maintenance and safeguard capability of the reporting

system. The public platform in WeChat named "National Working Office for Corporate GHG Reporting" was created to provide assistance and consulting services for the public.

(II) Enhancing Scientific and Technological Support

Launching fundamental scientific research. In 2016, MOST kicked off a range of basic science research projects in the field of climate change through the key national research and development project "Global Change and Response" and key special project "Restoration and Protection of Typical Fragile Ecosystems" and established the project of "Study of Urgent Major Issues to Tackle Climate Change after the Paris Conference", with the purpose to support the basic research on climate change. CMA recommended three special reports to the International Panel on Climate Change (IPCC), namely *Global Warming of 1.5°C*, *Ocean and Cryosphere in a Changing Climate* and *Climate Change and Land*. The Chinese Academy of Sciences (CAS) completed the study of "Carbon Budget Certification for Climate Change and Related Issues" and accomplished innovative outcomes in carbon emissions from energy consumption, ecosystem carbon sequestration, climate sensitivity, climate change impact and adaptation, and green development policy design.

Accelerating research, development and application of

low-carbon technologies. NDRC released the *Catalog of National Key Energy-Efficient and Low-Carbon Technologies for Promotion (2016 Version, Energy Conservation Section)* in January 2017 and the *Catalog of National Key Energy-Efficient and Low-Carbon Technologies for Promotion (2017 Version, Low-carbon Section)* in March 2017. MOST, MEP and CMA jointly developed and issued the *Special Plan for Scientific and Technological Innovation to Address Climate Change During the 13th Five-Year Plan Period* in 2017, which clearly defined the development way, objective, key technology development directions, key tasks and supporting measures for the scientific and technological innovation during the 13th FYP period. MOT continued the work of selecting and promoting key technologies for energy conservation and emission reduction in the transportation sector, and together with MOF, rolled out the subsidy policies and technical guidelines for the use of shore power facilities and equipment by vessels pulled in the shore. NEA issued the *Recommended Catalog of Advanced Technologies and Equipment for Safe and Green Exploration and Efficient and Clean Use of Coal (First Batch)* in January 2016.

(III) Strengthening Personnel and Disciplinary Development

Strengthening personnel and institutional development. Many

departments organized capacity trainings on climate change to fully increase the capability to address climate change in relevant areas. NGOA provided remote online or face-to-face trainings to nearly 9,000 energy-saving managers at all level and with all categories. CMA set courses and training classes on scientific response to climate change and ecological civilization.

Developing disciplines on climate change. The Ministry of Education (MOE) encouraged colleges and universities to set up academic disciplines on climate change according to economic and social development needs and their own capacities, in order to speed up the training of talents that meet the social needs. Colleges and universities played an active role in training professionals in the field of climate change by strengthening the construction of education and research bases. In 2017, the newly-established China-UK International Low-carbon College of Shanghai Jiaotong University and the Low-carbon College of North China Electric Power University incorporated carbon capture and storage technologies and near-zero carbon emissions technology in the specialty setup respectively. The Chinese Academy of Social Sciences integrated the climate change economics into the preferential disciplines under the "Dengfeng Strategy". By the end of 2016, the atmospheric science has been integrated in 22 disciplines and energy conservation and environmental protection in

42 disciplines.

VI. Enhanced International Exchanges and Cooperation

In the spirit of mutual benefit, win-win, pragmatic and effective cooperation, the Chinese Government actively carried out practical cooperation with international institutions and all governments on climate change and green low-carbon development, and played a positive and constructive role in global cooperation to address climate change.

(I) Promoting Exchanges and Cooperation with International Organizations

China conducted extensive and pragmatic cooperation with international organizations and became actively involved in relevant international conferences and initiatives. It enhanced cooperation with such multilateral organizations as the World Bank, Asian Development Bank, United Nations Development Programme, and Global Environment Facility, and actively participated in the relevant meetings of the Green Climate Fund, Climate Change

Adaptation Fund, and Technology Executive Committee under the UNFCCC.

(II) Strengthening Exchanges and Cooperation with Developed Countries

China further strengthened dialogue and pragmatic cooperation with relevant countries in the field of climate change and green low-carbon development and achieved fruitful outcomes. NDRC signed the *Implementing Arrangement on Strengthening Cooperation on Climate Change* with the Ministry of Foreign Affairs and Trade, New Zealand to expand the scope of bilateral cooperation. China held meetings on bilateral cooperation mechanism with a number of parties and countries, such as the European Union, Australia, New Zealand, France, Russia, Korea and Germany to exchange views on climate policies and actions, strengthen bilateral cooperation and consolidate cooperation mechanisms. China also deepened bilateral fruitful and pragmatic cooperation in the fields of carbon market, energy efficiency, low-carbon cities, and climate change adaptation with many parties and countries, such as the European Union, France, Germany, Britain, Italy, Canada and Japan.

(III) Deepening South-South Cooperation on Climate Change

China actively pushed forward South-South cooperation on climate change and helped other developing countries to improve their capacities on climate change by developing low-carbon demonstration areas, donating energy-efficient and low-carbon materials and monitoring and warning facilities, and holding climate change South-South cooperation training workshops. NDRC signed with Seychelles a memorandum of cooperation on the construction of low-carbon demonstration areas and, with 28 developing countries, thememorandum of understanding to donate such materials as energy-efficient lamps and household solar power systems for tackling climate change. In terms of capacity building, a series of training workshops for South-South cooperation on climate change were held to help relevant developing countries train officials and experts in the field of climate change. MOCOM has accumulatively offered assistance to more than 70 developing countries through technical assistance and provision of materials and spot exchange, covering many areas such as clean energy, low-carbon demonstration, agricultural drought-resistant technology, water use and management, crop planting, smart grid, green ports, soil and water conservation, and emergency relief.

VII. Active Involvement in Global Climate Governance

Since 2016, the Chinese Government has continued, with an attitude of being fully responsible, to play a positive and constructive role in international negotiations, strengthen multi-level consultations and dialogues with all countries, and build a broad consensus on the issue of climate change, making positive contributions to advancing global governance and guiding international cooperation in addressing climate change.

(I) Actively Promoting Multilateral Processes under the United Nations Framework

China made active efforts to put the Paris Agreement into effect. In April 2016, Chinese Vice Premier Zhang Gaoli, as the special envoy of Chinese President Xi Jinping, attended the high-level signing ceremony of the Paris Agreement at the United Nations Headquarters in New York, and China became the first-batchcountriesto sign the Paris Agreement. In September 2016, China held a ceremony in Hangzhou to deposit the legal instruments ofratifyingthe Paris Agreement, where Chinese President Xi Jinping and US former President Barack Obama

submitted the respective ratificationinstruments to the Secretary-General of the United Nations. With the active promotion of countries such as China, most signatoriesto the Paris Agreement accelerated the ratification process, and the Paris Agreement formally entered into force on November 4, 2016.

China participated in the international negotiations under the UNFCCC in a constructive manner. China insisted on the principles of equity, common but differentiated responsibilities and respective capabilities, in the light of different national circumstancesand worked with other parties to advance the work programrelated to the implementation of Paris Agreement, so as to strengthen the comprehensive, effective and sustained implementation of the Convention and the Paris Agreement. In 2016, the Chinese delegation attended all the negotiating meetings including United Nations Climate Change Conference in Marrakech, submitted China's submissions on items of nationally determined contribution, adaptation, transparency, global stocktaking, compliance mechanism, etc. and played an active role in facilitating the negotiation process and coordinating different parties' positionby deeply communicating, enhancing mutual-understanding and building consensus with all parties. The 23rd Session of the Conference of the Parties (COP 23) to UNFCCC will take place in November 2017, Bonn, Germany, and China will continue to work

with all effortsfor the next step of international negotiations on climate change and promote the negotiations related to the implementation of the Paris Agreement to becompleted in 2018.

(II) Extensively Participating in Other Multilateral Processes

China has been actively involved in other multilateral processes of climate governance. In 2016, China provided contribution for the International Civil Aviation Organization (ICAO) on the resolution of global market-based measure and for the Conference of the Parties to Montreal Protocol to achieve the amendment for HFC emission reduction. China participated in the negotiations on maritime GHG emissions reduction under the International Maritime Organization (IMO). In the meantime, China actively joined and promoted the discussions on climate change related issues under the multilateral mechanisms such as G20, Asia-Pacific Economic Cooperation (APEC) and BRICS. In September 2017, China, Canada and the European Union co-hosted the First Minister-level Meeting on Climate Action (MoCA) to further build consensus of all parties and addnew political momentuminto the multilateral process ofaddressing climate change.

Facing increasing uncertainties in the global response to climate change, Chinese leaders have, in variousoccasions, delivered important speeches on China's firm stance in supporting the Paris

Agreement and the global climate governance process. At the beginning of 2017, Chinese President Xi Jinping said at the opening plenary of the World Economic Forum Annual Meeting 2017 that "the Paris Agreement is a hard-won achievement which is keeping with the underlying trend of global development. All partiesshould stick to it instead of walking away from it as this is a responsibility we must assume for future generations." He reiterated China's strong support for the Paris Agreement at the United Nations Headquarters in Geneva, calling on all parties to work together to implement the agreement and promising that China will continue to take steps to tackle climate change and onehundred per cent undertake its obligations. In June 2017, Chinese Premier Li Keqiang stressed during his visit to Germany that addressing climate change is not only the international responsibility borne by China as a big developing country, but also the underlying demand for China to change the development pattern. China will continue to fulfill its commitments and strive for green, low-carbon and sustainable development. China's steadfast positive attitude onclimate policy and action has demonstrated its accountability as a responsible partnerand injected an important impetus to the multilateral processes, which was praised by the international community.

China deepened dialogue with all countries in the field of climate

change. China stepped up the communication and coordination with other BRSIC (Brazil, South Africa, India and China) countries and the Like Minded Developing Countries (LMDCs) and hosted the 24th BASIC Ministerial Meeting on Climate Change in Beijing. China actively engaged in dialogues with Small Island Developing States (SIDS), Least Developing Countries (LDCs) and African countries to promote exchanges of views and actively work forthe rights and interests of developing countries. China also continued in-depth dialogue and communication with developed countries, strengthened China-EU cooperation on addressing climate change, promoted policy dialogues and interactions with other developed countries such as Australia and New Zealand, in order to promote mutual understanding and expanding consensus and contribute to the international dialogue and cooperation on climate change.

(III) China's Basic Position and Stance on COP23

The COP23 will be held in Bonn in November 2017 and should put emphasis on work in the following three aspects: (1) further promote negotiations on the work program related to the implementation of Paris Agreement, and strive to formulate a draft negotiating text, which covers all elements of mitigation, adaptation, finance, technology and capacity building, embodies the principles of equity, common but differentiated responsibilities and respective

capabilities, in the light of different national circumstances,and reflects the concerns of parties in a balance manner, so as to paves the wayfor follow-up negotiations scheduled to be completed in 2018; (2) make a good preparation for the facilitative dialogue in 2018, which should cover all aspects of mitigation, adaptation and implementation approaches, focus on the process of the implementation of pre-2020commitments and actions, and promote the exchange and sharing of good experiences and best practices under a principle of encouragement, in order to drive the global cooperation to address climate change; and (3) strengthen the fulfillment of commitments and actions before 2020, and in particular, accelerating the ratification of the Doha Amendment to the Kyoto Protocol so that it could enter into effect as soon as possible. The developed countries should earnestly honor their commitments to mobilizing 100 billion US dollars per year by 2020 and providing finance, technology and capacity building support to developing countries, laying a solid mutual-trust foundation for post-2020 climate actions.

China will continue to work with all Parties to promote the success of the COP23 in an open, transparent, inclusive, consensus-basedand party-driven manner.

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