

China's Policies and Actions for Addressing Climate Change (2018)

Ministry of Ecology and Environment

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Foreword

Climate change is a common challenge facing mankind. The Chinese government has always attached great importance to addressing climate change, promoted to construct an equitable, rational, cooperative and win-win global climate governance system with a constructive attitude, and adopted practical and effective policies and measures to strengthen domestic actions to address climate change, demonstrating a firm determination to promote sustainable development and green and low-carbon transformation.

Since 2017, China has become an important participant, contributor, and torch bearer in the global endeavor for ecological civilization through taking a series of measures to push forward the work on addressing climate change with positive progress achieved. In 2017, China's carbon dioxide emissions per unit of gross domestic product (GDP) (hereinafter referred to carbon intensity) declined by approximately 46% compared to 2005, already exceeding the 2020 target of reducing carbon intensity by 40%-45%, which preliminarily reversed the rapid growth trend of carbon emissions. Non-fossil energy accounted for 13.8% of primary energy consumption, the task of afforestation and forest protection continued to advance, and the ability to adapt to climate change has been continuously enhanced. The institutional mechanisms for addressing climate change has been continuously improved, the organization and team building strengthened, and the awareness of climate change in the whole society improved. This report has been prepared to help all interested people fully understand China's policies and actions and their performance and effects in addressing climate change since 2017.

The Report Delivered at the 19th National Congress of the Communist Party of

China (CPC) and the National Conference on Ecology and Environment Protection held in 2018 proposed higher requirements for addressing climate change. In 2018, in accordance with the arrangements for the institutional reform of Chinese government, the functions of addressing climate change and emission reduction were allocated to the Ministry of Ecology and Environment (MEE), which will enhance the synergy between addressing climate change and preventing and controlling environmental pollutions and enhance the integrity of ecology and environment protection. In the next step, thoroughly following out Xi Jinping's Thought on Socialism with Chinese Characteristics for a New Era and the spirit of the 19th National Congress of CPC and guided by Xi Jinping's thought on ecological civilization, we will fully implement the deployment and requirements of the National Conference on Ecology and Environment Protection, implement a national strategy to actively address climate change, coordinate to promote domestic and international work, and give full play to the role of addressing climate change in promoting ecological civilization construction, leading high-quality development and coordinating environmental pollution prevention and control.

I. Climate Change Mitigation

Since 2017, the Chinese government has achieved positive results through a series of proactive actions, including adjusting the industrial structure, optimizing the energy structure, conserving energy and improving energy efficiency, controlling GHG emissions from non-energy activities and increasing carbon sinks. In 2017, China's carbon intensity declined by approximately 46% compared to 2005, already exceeding the 2020 target of reducing carbon intensity by 40%-45%.

(I) Adjusting the Industrial Structure

Energetically developing the service industry. In 2017, China's service industry saw continuously faster development, and contributed to 58.8% of economic growth; the added value of the service industry took up 51.6% of GDP, the same with the previous year. In the first half of 2018, the service industry maintained steady growth, and the growth rate of its added value was 1.5 percent points (pps) higher than that of the secondary industry; the added value of the service industry took up 54.3% of GDP, 0.3 pps higher than the same period of last year and 13.9 pps higher than the secondary industry. As the biggest industry in national economy, the service industry effectively props up and promotes national economy to seek progress while maintaining stability. In the first half of 2018, the service industry contributed to 60.5% of national economic growth, 23.8 pps higher than the secondary industry; it drove GDP to grow by 4.1 pps, 1.6 pps higher than the secondary industry.

Proactively developing strategic emerging industries. In January, 2017, the National Development and Reform Commission (NDRC) organized, together

with relevant departments, the formulation of the *Guiding Catalogue of Key Products and Services for Strategic Emerging Industries (2016 Edition)*, involving 8 strategic emerging industries in 5 major fields. The Ministry of Industry and Information Technology (MIIT) and NDRC jointly released the *Guidelines for Information Industry Development* to guide the sustainable and healthy development of the information industry during the 13th Five-Year Plan (FYP) period. Under the guidance of relevant policies and as mobilized by the continuous rapid growth of key industries and enterprises, strategic emerging industries grew steadily. Throughout 2017, the added value of strategic emerging industrial sectors above a designated scale increased by 11.0% over the previous year, and the added value of the high-tech manufacturing industry increased by 13.4% and took up 12.7% of the added value of industrial sectors above a designated scale. In 2017, around 794,000 new energy vehicles were produced, increased by 53.8% over the previous year; and around 777,000 new energy vehicles were sold, increased by 53.3%. In the first half of 2018, the production of new energy vehicles amounted to around 413,000, increased by 94.9%; the sales volume of new energy vehicles was around 412,000, increased by 111.5%.

Speeding up the resolution of overcapacity. NDRC issued the *Opinions on Effectively Addressing Overcapacity in the Steel and Coal Industries for Purposes of Achieving Turnaround Development* in 2017, the *Opinions on Advancing the Supply-Side Structural Reform to Prevent and Resolve the Risk of Overcapacity of Coal Power*, the *Notice on Addressing Overcapacity in Key Fields* in 2018 and other documents in succession in 2017 and 2018, continuously deepening the supply-side structural reform and achieving remarkable effect. In 2017, coal and steel industries successfully completed their respective yearly task of resolving overcapacity. In specific, overcapacity of steel was reduced by more than 55 million tons, overcapacity of coal was cut down by 250 million tons, and the overcapacity of the phased out, cancelled or

deferred coal power projects totally exceeded 65 GW. In addition, among state-owned enterprises, ChemChina shut down 2.5 million tons of overcapacity for synthesis ammonia, urea and etc., and made “zero investment” in overcapacity projects; China COSCO Shipping Group scrapped approximately 3 million deadweight tons of old operating ships, effectively reducing energy consumption of fleets.

In 2017, China witnessed the first rise in annual economy growth rate since 2011 while continuing to optimize the economic structure. GDP grew by 6.9% compared to last year, and GDP growth rate was 0.2 pps higher. In specific, GDP of the primary industry grew by 3.9%, the secondary industry 6.1% and the tertiary industry 8.0%. The added value of the primary industry took up 7.9% of GDP, the secondary industry 40.5% and the tertiary industry 51.6%.

(II) Optimizing the Energy Structure

Continuing strict control over coal consumption. In 2017, NDRC released the *Plan for Clean Heating in Winter Season in Northern Areas (2017-2021)*, proposing to increase the clean heating rate for northern areas to 50% by 2019 and 70% by 2021, and forming a clean heating pattern in which scattered coal is substituted by natural gas and electricity in Beijing-Tianjin-Hebei region and air pollution transmission channels including “2+26” cities. NDRC actively promoted Beijing-Tianjin-Hebei region and surrounding areas, the Yangtze River Delta, the Pearl River Delta and other key areas to implement key projects of energy-saving and environmental transformation of coal-fired boilers, using waste heat for heating, utilizing shallow geothermal energy, etc., issued the *Notice on Accelerating the Development and Utilization of Shallow Geothermal Energy to Promote Coal Consumption Reduction and Substitution in the Heating Areas of the North*, and jointly with the relevant departments, supervised and inspected on the completion of the targets and tasks for coal consumption reduction and substitution in key areas. In 2017, all key regions

completed the 2013-2017 coal consumption reduction targets required by the *Air Pollution Prevention and Control Action Plan* issued by the State Council. In 2018, the Central Committee of CPC and the State Council issued the *Opinions on Comprehensively Enhancing Ecological and Environmental Protection and Resolutely Winning the Tough Battle for Prevention and Control of Pollution*, requesting to continue to exercise control over total coal consumption in key regions, and reduce coal consumption by 10% from 2015 to 2020 in five provinces (municipalities directly under the Central Government) including Beijing, Tianjin, Hebei, Shandong, Henan and the Pearl River Delta and by 5% in Shanghai, Jiangsu, Zhejiang, Anhui and the Fen-Wei Plain. In 2017, the national total coal consumption showed an overall stable trend, and coal consumption in Beijing-Tianjin-Hebei region was on a decline.

Pushing ahead the clean use of fossil energy. From 2017 onwards, NDRC established and improved the priority power generation system, reduced the thermal power capacity in an orderly manner, and reserved space for clean energy, as well as carried out pilots of nearby consumption in Jilin, Gansu, Inner Mongolia, etc., explored continuous and full clean energy electricity supply in Qinghai, and encouraged electric energy substitution to promote clean energy consumption. NDRC continued to push ahead the green and efficient development and utilization of coal, popularized the application of mature and advanced energy conservation and emission reduction technologies, and speeded up the ultra-low-emission transformation of coal-fired power generation units. In March, 2018, NDRC and National Energy Administration (NEA) released the *Guiding Opinions on Improving the Dispatching Capacity of the Power System*, starting the implementation of thermal power flexibility improvement project. As of the end of 2017, China had cumulatively completed 700GW of ultra-low emission transformation and 604 GW of energy-saving transformation for coal power generation units, and weeded out and shut down more than 20 GW of outdated coal power capacity. It continued

to push ahead the improvement of the quality of oil products, and took efforts to expand the production of biofuel ethanol and generalize the use of ethanol gasoline for motor vehicles. Gasoline and diesel oil for motor vehicles up to National V Standard was supplied across China upon January 1, 2017, general diesel oil with sulfur content (50ppm) the same with National IV Standard was supplied across China upon July 1, gasoline and diesel oil for motor vehicles up to National VI Standard was supplied in “2+26” cities ahead of schedule from October 1, and general diesel oil with sulfur content equal to or smaller than 10ppm was supplied across China upon November 1 ahead of schedule. Moreover, China accelerated the promotion of natural gas utilization. In 2017, NDRC released, together with many other departments, the *Opinions on Accelerating the Utilization of Natural Gas*, proposing to implement the urban gas project, natural gas-fired power generation project, industrial fuel upgrading project and transport fuel upgrading project. In 2017, China’s natural gas consumption amounted to 238.6 billion cubic meters, increased by 14.8% compared to 2016.

Energetically developing non-fossil energy. From 2017 onwards, NEA has released a series of documents including the *Guiding Opinions on the Implementation of the Renewable Energy Development Plan during the 13th FYP Period*, for the purpose of promoting the large-scale development of renewable energy. In October and November, 2017, NDRC and NEA jointly released the *Notice on Promoting Hydropower Consumption in Southwest China* and the *Implementation Plan for Solving Hydropower, Wind Power and Photovoltaic Power Abandonment Problems* to intensify the incorporation of renewable energy into the grid. In February, 2017, NDRC, Ministry of Finance (MOF) and NEA jointly issued the *Notice on the Pilot Implementation of the Renewable Energy Green Electricity Certificate Issuance and Voluntary Subscription Trading System*, with the aim to promote renewable energy development through the market mechanism. The Ministry of Water Resources

(MWR) launched the creation of green small hydropower stations through issuing the *Guiding Opinions on Promoting Green Small Hydropower Development* and promulgating the *Green Small Hydropower Assessment Standard*. In November, 2017, the former State Forestry Administration (SFA) released the *Catalogue of Major Tree Varieties for Forestry Biomass Energy (First Group)*. As of the end of 2017, the national installed capacity of renewable electricity amounted to 650 GW, with a year-on-year increase of 14%, and it took up 36.6% of total installed capacity of electricity, with a year-on-year increase of 2.1%. In 2017, the national electricity generation from hydropower, wind power and solar power amounted to 1.6 trillion kWh, with a year-on-year increase of 98.9 billion kWh.

In 2017, China's energy structure was optimized further through a series of measures. The share of coal consumption in energy consumption was 60.4%, down 1.6% over 2016; petroleum 18.8%, up 0.5%; natural gas 7.0%, up 0.6%; and non-fossil energy 13.8%, up 0.5%.

(III) Promoting Energy Saving and Improving Energy Efficiency

Strengthening the target responsibility. During the 13th FYP period, China implemented the “double control” action on the total energy consumption and energy intensity. The *Outline of the 13th FYP for the National Economic and Social Development of the People's Republic of China* required to reduce national energy consumption per unit of GDP by 15%, and control the total energy consumption within 5 Gtce during the 13th FYP period. Since 2017, NDRC and relevant departments have conscientiously implemented the work arrangements of the Central Committee of CPC and the State Council on “double control” and actively adopted various measures to promote “double control” work. According to the requirements of the State Council, annual “double control” assessment at the provincial level was organized; the *Energy Conservation Supervision Measures*, the *Measures for Energy Conservation*

Review of Fixed Asset Investment Projects, and the Measures for Energy Conservation Management in Key Energy Consumption Units were formulated and revised, with a view to strengthening supervision and inspection on the implementation of energy conservation laws and regulations. The energy conservation management in key energy consumption units was strengthened, the “Hundred, Thousand and Ten Thousands” energy conservation actions in key energy consumption units were implemented, and various regions decomposed the total energy consumption control and energy-saving targets into key energy consumption units. Under the vigorous promotion of a series of measures, the national "double control" work in 2016 and 2017 met the schedule requirement in the 13thFYP period.

Improving the statistical system and the standard system. In 2017, National Bureau of Statistics (NBS) amended and improved the *Statistical Reporting Form System for Energy* to expand the statistical survey scope of energy production and distribution and improve the statistical system for basic data of energy conservation and emission reduction. NDRC released the *Statistical Survey System for the Sales of Energy-Efficient Household Appliances (for Trial Implementation)* to boost green consumption proactively. The former General Administration of Quality Supervision and Inspection (AQSIQ) and NDRC released the *Guiding Opinions on Further Strengthening Energy Measurement* to improve the energy measurement system. NDRC and the Standardization Administration (SAC) issued the *Plan for the Construction of the Energy Conservation Standard System*, with all-round deployment for the construction of national, industrial and local energy conservation standard systems prior to 2020. NDRC, former AQSIQ and SAC continued to push forward the implementation of the “One Hundred Energy Efficiency Standards Promotion Program”. NEA pushed ahead the development and amendment of standards in such fields as “Internet Plus” smart energy, charging facilities of electric automobiles, solar power generation, natural gas power generation,

energy storage and energy production safety. NDRC and former AQSIQ jointly released the *Work Plan for Promotion and Construction of Online Energy Consumption Monitoring System in Key Energy Consumption Units*, pushing ahead the construction of the online energy consumption monitoring system in key energy consumption units. The former AQSIQ organized the special inspection on law enforcement of energy efficiency labels for energy-saving products in beneficiary projects on energy saving.

Popularizing energy conservation technologies and products. In February, 2018, NDRC released the *Catalogue of National Key Energy Conservation and Low-Carbon Technologies for Promotion (2017 Edition, Energy Conservation Section)*, publishing 260 key energy conservation technologies in 13 industries including coal, electric power, steel, nonferrous metals, petroleum and petrochemical, chemical engineering and building materials. MOF and NDRC adjusted and released, at regular intervals, the catalogue of government procurement of energy conservation products and the catalogue of government procurement of environmental label products, and implemented mandatory procurement and prior procurement policies for products in said catalogues. In 2017, government procurement of energy conservation and environmental protection products was worth 344.4 billion RMB, taking up more than 90% of similar products. MOF, State Administration of Taxation (SAT), MIIT and Ministry of Transport (MOT) jointly released the *Notice on Preferential Vehicle and Vessel Tax Policies for Energy-Saving and New-Energy Vehicles and Vessels*, halving the vehicle and vessel tax for energy-saving vehicles.

Speeding up the development of circular economy. In January, 2017, NDRC, MOF, former Ministry of Environmental Protection (MEP) and NBS jointly issued the *Circular Economy Development Assessment Indicator System (2017 Edition)* to provide guidance for circular economy practice in all places. In May, 2017, 14 departments including NDRC jointly issued the *Circular Development Leading Action*, with uniform arrangement and overall

deployment for the development of the circular economy during the 13th FYP period. NDRC released the *Guiding Opinions on Promoting the Construction of Resources Cyclic Utilization Bases* to improve the fine management of municipal wastes.⁷ departments including MIIT issued the *Interim Measures for the Management of the Recycling of Power Storage Batteries of New Energy Vehicles* to establish a recycling system for power storage batteries of new energy vehicles. SAC and NDRC approved 26 units to carry out pilot and demonstration work on circular economy standardization.

Advancing the energy-efficient and green development in construction. In 2017, the Ministry of Housing and Urban-Rural Development (MOHURD) issued the *Plan for the Development of Building Energy Conservation and Green Building during the 13th FYP Period* and the *Special Plan for Scientific and Technological Innovation in Housing and Urban-Rural Development during the 13th FYP Period*, with the aim to push forward the green development in building area. The green building standard was comprehensively implemented in urban indemnificatory housing, government-invested welfare buildings and large-scale public buildings in cities above provincial capital level across China. Beijing, Tianjin, Shanghai, Chongqing, Jiangsu, Zhejiang and Shandong have implemented the green building standard comprehensively in new buildings in urban areas. MOHURD, formulated the *Guiding Opinions on Pushing forward Urban Clean Heating in Northern Heating Areas* in conjunction with NDRC, MOF and NEA and confirmed the first group of 12 pilot cities for clean heating in winter in northern areas in conjunction with MOF, former MEP and NEA. It also confirmed, together with China Banking Regulatory Commission (CBRC), the first group of 29 key cities for energy efficiency improvement of public building, promoted the development of prefabricated building, and intensified the generalization of green building materials. As of the end of 2017, the proportion of urban new buildings in which mandatory energy conservation

standard is executed basically reached 100%, built-up energy-saving buildings covered an area of 17 billion square meters cumulatively, energy-saving building took up more than 51% of new civil buildings in urban areas, a total of 2.31 billion square meters of green buildings have been built in urban areas and green buildings took up more than 40% of new civil buildings in urban areas; northern heating areas cumulatively completed building energy conservation transformation in existing residential buildings covering an area of 1.3 billion square meters. Regions with hot summer and cold winter cumulatively completed building energy conservation transformation in existing residential buildings covering an area of 100 million square meters; the area of concentrated solar thermal application was 495 million square meters, and shallow geothermal energy application area was 520 million square meters; and 456 building material products have obtained the green building material label on a national scale.

Advancing energy conservation and green development in transport. In 2017, MOT issued successively the *Implementation Plan for the Promotion of Ecological Civilization in Transport* and the *Opinions on Comprehensively and Profoundly Promoting the Development of Green Transport*, defining the goals and key tasks for the development of green transport by 2020. It also released the *Opinions on Comprehensively Enhancing Ecological and Environmental Protection and Resolutely Winning the Tough Battle for Prevention and Control of Pollution* to promote infrastructure construction for green transport in all aspects and generalize innovation in clean and efficient transport equipment and modes. MOT carried out the construction of the national demonstration metropolis on public transport in three batches of 87 cities, and issued and improved, together with MOF and other departments, subsidy policies for refined oil price of urban buses. In 2017, former MEP issued, in conjunction with relevant departments and local governments, the *Work Plan for Air Pollution Prevention and Control in the Beijing-Tianjin-Hebei Region and*

Surrounding Areas to promote the adjustment of transport structure and enhance prevention and control of pollution from motor vehicles and other mobile sources. The National Railway Administration (NRA) issued the *Goals and Measures for Implementing the Spirit of the First Session of the Central Finance and Economics Committee and the National Conference on Ecological and Environmental Protection to Win the Battle for the Blue Sky*, confirming the goals and specific measures for increasing the railway freight volume. The Civil Aviation Administration of China (CAAC) issued the *Energy Conservation and Emission Reduction Plan in Civil Aviation during the 13th FYP Period*, defining the objectives, requirements and important tasks for green development in civil aviation during the 13th FYP period. As of the end of 2017, over 350,000 new energy vehicles were generalized and applied in the transport industry, and the goal in 2020 was obtained ahead of schedule. In specific, the quantity of new energy buses exceeded 250,000, taking up approximately 40% of the total buses and trolley buses nationwide.

Through joint efforts, the energy consumption per unit of GDP declined by 5% and 3.7% respectively in 2016 and 2017, and by 8.5% accumulatively in the two years.

(IV) Controlling GHG Emissions from Non-Energy Activities

Controlling GHG emissions from the industrial sector. In March, 2018, NDRC issued the *Notice on Launching Relevant Work on the Inspection of the Disposal of Hydrofluorocarbons in 2017*, organized the inspection of the disposal of hydrofluorocarbons (HFCs) in 2017, published the inspection results of 11 enterprises, ensured the normal operation of HFC-23 destruction devices, and provided quota-based subsidies to enterprises that perform destruction. In September, 2017, former MEP released the *Technical Guidance for the Accounting of Pollutant Removal and Greenhouse Gas Control of Pollution Control Facilities for Industrial Enterprises (for Trial*

Implementation), promoted the co-control of ambient pollutants and GHGs proactively, and organized trainings of capacity building for the co-control of ambient pollutants and GHGs and the statistical survey of fluoride-containing gases. Efforts were continued to push ahead the construction of large-scale mine lots for the extraction of coal-mine gas, implement the demonstration projects of coal-mine gas extraction and utilization, and strengthen the monitoring and control of volatile organic compounds (VOC) and methane escape from oil and gas systems.

Controlling GHGs from agricultural sector. Efforts were continued to implement the “Action to Achieve Zero Growth of Chemical Fertilizer Use by 2020” and the “Action to Achieve Zero Growth of Pesticide Use by 2020”, and vigorously generalize the technologies of testing soil for formulated fertilization and reducing the quantity and improving the efficiency of chemical fertilizers and pesticides. In 2017, the national chemical fertilizer use rate of the three major cereal crops, paddy, corn and wheat was 37.8%, 2.6 pps higher than 2015, and zero growth was achieved in chemical fertilizer and pesticide use ahead of schedule. Proactive control was exercised over GHG emissions from livestock and poultry. The *Opinions on Accelerating the Promotion of the Livestock and Poultry Breeding Waste Resource Utilization* was issued in June, 2017 and the *Work Plan for the National Project of the County-wide Promotion of Livestock and Poultry Excrement Resource Utilization (2018-2020)* was issued in August, 2017, launching the implementation of the project of the county-wide promotion of resource use of livestock and poultry excrement. In 2017, the comprehensive utilization rate of livestock and poultry excrement reached 70%, and the comprehensive utilization rate of straws and stalks exceeded 82%. Efforts were also made to support the biogas construction and promote biogas transformation and upgrading in rural areas. As of the end of 2017, the number of biogas-using households was 41 million or so, and nationwide yearly production of biogas reached 14.083 billion cubic meters.

Controlling GHG emissions from waste disposal sector. Active efforts were made to push ahead waste resource utilization and harmless disposal proactively, and regulate waste classification and recovery. The *Plan for the Implementation of the Household Waste Classification System*, released in March, 2017, presents the goals of “basically building law, regulation and standard systems for waste classification, forming duplicable and transferrable household waste classification modes, and increasing the household waste recycling rate of cities where mandatory classification of household wastes is implemented to above 35% by the end of 2020”.

(V) Increasing Carbon Sinks

Increasing forestry carbon sinks. China speeded up the implementation of the *Outline of National Afforestation Plan (2016-2020)* and relevant programs, proactively pushed forward the construction of natural forest resource protection, Grain for Green, desertification prevention and control, integrated control of stony desertification, construction of shelterbelt networks in the Three Norths and the Yangtze River Basin and other key forestry projects, innovatively promoted all-people voluntary tree-planting and departmental afforestation, and carried out large-scale land greening actions. The *National Forest Management Plan (2016-2050)* was implemented in all aspects, issued guidelines for the formulation of forest management plans at provincial and county levels, carried out forest tending and degraded forest structure remediation in an all-round way, and advanced the pilot and demonstration programs of sustainable forest management. In November, 2017, the *Plan for the Accurate Improvement Program of Forest Quality during the 13th FYP Period* was issued to launch 18 demonstration projects of the accurate improvement program to steadily improve forest quality. Efforts were made to protect natural forests in all aspects, including speeding up the development of the *Regulation on the Protection of Natural Forests* and the *Plan of the Natural*

Forest Protection and Remediation System, and keeping implementing the quota of all-round cancellation of the commercial logging of natural forests. In 2017, forests were planted in an area of 7.6807 million hectares (115 million mu) and cultivated in 8.8564 million hectares (133 million mu), making China rank first by forest resource growth in the world; newly-increased area of natural forest management and protection was 200 million mu, and yearly reduction in forest resource consumption was 34 million cubic meters. Former SFA issued the *Notice on Launching the Construction of the National Forestry Carbon Sinks Measurement Monitoring System in 2017* and the *Second National Land Use, Land Use Change and Forestry (LULUCF) Carbon Sinks Measurement Monitoring Plan*, to strengthen forestry carbon sink statistics.

Increasing grassland carbon sinks. Efforts were made to strengthen grassland ecology protection and construction, and implement major grassland ecology remediation projects such as returning grazing land to grassland (farmland returning to woodland) and management of grassland in Southwest karst regions. Grassland ecological environment was improved. In 2017, comprehensive vegetation coverage of grassland nationwide reached 55.3%, 0.7 pps higher than the previous year; gross production of fresh grass of natural grassland was 1.065 billion tons, with an increase of 2.53% over the previous year. The prevention and control of desertification was strengthened. In 2017, by implementing the sandstorm source control and comprehensive stony desertification control projects in Beijing and Tianjin, an area of 460,600 hectares of afforestation was completed, an area of 6,700 hectares of engineering sand-fixation land was completed and an area of 3,300 square kilometers of stony desertification land was governed; 19 pilot counties were newly listed as closed zones for preservation of desertification land and 33 national desert (stony desert) parks were approved. According to the latest monitoring result, China achieved “dual reductions” in desertification and dandification area, “dual mitigations” in desertification and dandification

degree, and “dual improvements” in vegetation coverage and carbon sequestration capacity of desert zones.

Increasing other carbon sinks. The comprehensive protection of wetland was pushed forward in an in-depth manner, and relevant working systems were established and improved. In 2017, the former SFA took the lead to found the Wetland Protection and Remediation Leading Group and Office, in which 8 departments participate; the former SFA, NDRC and MOF jointly issued the *Implementation Plan of National Wetland Protection during the 13th FYP*; the former SFA and relevant departments jointly issued the *Implementation Opinions on Thoroughly Implementing the Wetland Protection and Remediation System and Scheme*, completed 7 supporting systems and key tasks to be established at national level including the *Regulation on the Administration of Wetland Protection*, and implemented a group of key projects for wetland protection and remediation. The State Oceanic Administration (SOA) carried out preliminary study on carbon sinks of marine ecosystems. In 2017, arrangements were made for returning 300,000 mu of farmland to wetland; international wetland city certification was launched, and 6 cities were nominated to the Convention on Wetlands; another 8 wetlands of international importance were designated, adding the total number to 57; another 65 national wetland park pilots were established, adding the total number of national wetland parks to 898; proportion of national wetland protection area increased to 49.03%, and wetland ecological condition improved apparently; and 233 sea ranches were built up across China.

II. Climate Change Adaptation

Since 2017, the Chinese government has made positive progress in adapting to

climate change, covering agriculture, water resources, forestry, ocean, meteorology, disaster prevention, mitigation and relief as well as capacity building for adaptation.

(I) Improving Adaptation Capacity in Key Areas

Agricultural sector. In April, 2017, MOF and former AQSIQ amended the *Measures for the Management of Subsidy Funds for the Protection of Agricultural Resources and Ecology* in support of the agricultural resource conservation, ecological protection and benefit compensation. In 2017, the former AQSIQ and MOF carried out the pilot program of substituting chemical fertilizers with organic fertilizers in 100 selected key counties (cities, districts) of regions with the aim to generalize the production technology pattern in which chemical fertilizers are substituted by organic fertilizers in an integrated manner and establish a long-term mechanism for the substitution of chemical fertilizers with organic fertilizers in fruit, vegetable and tea cultivation. All provinces (regions and municipalities) completed 3,297 detailed agro-climate zonings at county level and 4,563 major agro-meteorological disaster risk zonings, providing support for the management of agro-meteorological disaster risks. Efforts were continued to strengthen farmland infrastructure construction. Farmland water conservancy was taken as the major direction of farmland construction, forces were concentrated on the construction of high-standard farmland, efficient water-saving irrigation was carried out comprehensively, and great efforts were exerted to promote the reform of the farmland water conservancy management system and the comprehensive reform of agricultural water prices.

Water resources sector. Control over water consumption quantity and intensity was promoted, and construction of a water-saving society was carried out profoundly. In 2017, the Ministry of Water Resources (MWR) issued the *Notice on Launching the Up-to-Standard Construction of Water-Saving Society*

at County Level and the Standard for the Evaluation of Water-Saving Society, comprehensively starting the up-to-standard construction of water-saving society at county level. In 2017, 65 counties (districts) completed the construction of a standard water-saving society. Construction of water-saving carriers was promoted in all aspects, deployments were made for the creation of water-saving resident communities, great efforts were exerted to promote the construction of water-saving enterprises, irrigation areas and units, and more than 79.7 thousand water-saving carriers of all kinds were built up accumulatively nationwide. NDRC, jointly with MWR and former AQSIQ, released the *Measures for the Administration of Water Efficiency Labels*, and established the water efficiency labeling system. Three national technical standards, including the *General Technical Rules for Water Conservation Contracting*, *Code for Calculation of Water Saved by Projects* and *Technical Guides for Water Saving Assessment* were issued, and amendment of 8 national norms of water intake including that for soda ash was completed. The construction of efficient water-saving irrigation projects was accelerated, and nationwide efficient water-saving irrigation area reached 310 million mu. Implementation of the *Water Pollution Prevention and Control Action Plan* was pushed forward solidly, and water ecology and environment protection of the Yangtze River and other key watersheds was enhanced continuously. The *Technical Guidelines for Delineating Source Water Protection Areas* was amended to continuously deepen drinking water source environment protection. The former MEP and MOHURD issued the *Implementation Plan for the Tough Battle for the Treatment of Urban Black and Odorous Waters*, carried out the special environmental protection action on treatment of urban black and odorous waters, and promoted the treatment of urban black and odorous waters in all aspects.

Forestry and ecosystems. China stepped up the administration of forest land conservation, implemented forest land protection and utilization plans at

national, provincial and county levels strictly, executed the examination and approval of woodland use by construction projects strictly, intensified the administration of forest land quotas, carried out the first full-coverage law enforcement inspection of 87 forestry administration bureaus in the state-owned forest regions of Northeast China and Inner Mongolia, and carried out the target-oriented responsibility system inspection of the woodlands, forest cutting and protection and development of forest resources in 200 counties. The implementation of the *National Forest Fire Prevention Plan (2016-2025)* was continued, and the central budget arranged 1.48 billion RMB of investment and about 600 million RMB of fiscal aid to strengthen the construction of forest fire prevention infrastructure. China also strengthened the protection of grassland ecology through carrying out grazing banning and rest and a balance between forage and animal and intensifying the supervision of law enforcement concerning grassland. In 2017, China spent 18.76 billion RMB of subsidy and reward funds for grassland ecology protection, carried out grazing banning in an area of 1.206 billion mu, and achieved a balance between forage and animal in an area of 2.605 billion mu. Natural reserve construction was strengthened. In 2017, the former SFA arranged 640 million RMB to support infrastructure construction and capacity building of national natural reserves. As of the end of 2017, forestry departments had built 2,249 natural reserves of all kinds and at all levels, with a total area of 126.13 million hectares, taking up about 13.14% of national land area.

Marine sector. In 2017, the former SOA formulated and released the *Development Plan of National Maritime Economy during the 13th FYP Period*, and relevant coastal provinces (regions and municipalities) promulgated the provincial marine main function planning. The *China Sea Level Communique 2017* was issued to assess sea level rise and its impact comprehensively and provide basis for addressing climate change scientifically in coastal regions. It further intensified protective measures of marine ecology and environment, and

launched the pilot program of “Gulf Chief System”. In 2017, the former SOA and relevant departments jointly developed *the Guiding Opinions on Improving and Strengthening Financial Service for the Development of Marine Economy*, guiding the cumulative input of approximately 170 billion RMB of loans from development and policy-oriented finance to the marine sector, and marine industry funds established in coastal provinces (regions and municipalities) amounted to 320 billion RMB.

Meteorological sector. China has completed the general survey of meteorological disaster risk in all districts and counties, cumulatively completed the general survey of risk and data entry of 356,000 medium and small rivers, 590,000 torrent ditches, 65,000 mudslide sites and 280,000 landslide risk sites, and completed the flood/ flash flood hazard mapping and its application covering over two thirds of medium and small rivers. China Meteorological Administration (CMA) issued the *Guidelines for the Meteorological Risk Warning Service Standardization for Flood, Flash Flood and Geological Disasters of Small and Medium-Sized Rivers at Basic Level*, carried out 897 pilots of meteorological risk warning service standardization for flood, flash flood and geological disasters of small and medium-sized rivers at basic level, and realized the “Five-Having and Three-Coverage” early warning of meteorological hazard risks at basic level. It strengthened the prevention of waterlogging in cities, and carried out rainstorm intensity formula development or rainstorm pattern design for the drainage and waterlogging prevention design of 83 cities. The capacity building on meteorological guarantee was enhanced. The *National Eco-Meteorological Communique 2016* was compiled, the *Blue Book of Agriculture for Addressing Climate Change-Assessment Report of Agro-Meteorological Disasters and Yield Losses in China* was published, and the ecological and environmental meteorological services were provided proactively.

Disaster prevention, mitigation and relief. In July, 2017, MOF, former

AQSIQ, MOA, MWR and former Ministry of Land and Resources (MLR) jointly released the *Measures for the Administration of Subsidy Funds of the Central Finance for the Relief of Agricultural Production Disasters and the Management of Exceptionally Serious Floods and Droughts* in support of agricultural production disaster relief for addressing agricultural disasters, management of exceptionally serious floods and droughts for addressing flood and drought disasters and geological disaster relief for addressing emergent geological disasters. MWR prevented river floods effectively through dispatching water conservancy projects scientifically in flood season, strengthened prediction, forecasting and warning, issued 755 flood warnings to the public in time, launched 27 emergency responses, sent 420 plus working teams to the front lines of floods and droughts, and supported local governments with flood and drought management, rescue and mitigation. In 2017, China National Commission for Disaster Reduction (NCDR) and the Ministry of Civil Affairs (MCA) launched a total of 17 national emergency responses for disaster relief, emergently allocated nearly 30,000 tents, 116,000 coats and quilts, 31,000 sleeping bags, 69,000 folding beds and other central disaster relief supplies, and helped local governments to guarantee basic livelihood of the masses. In 2017, the former SOA issued the *Work Plan for Thoroughly Implementing the Opinions of the Central Committee of CPC and the State Council on Promoting the Reform of Disaster Prevention and Mitigation Systems and Mechanisms* to make comprehensive deployments for marine disaster prevention and mitigation in the new era. In January, 2018, CMA released the *Opinions of Strengthening Disaster Prevention, Mitigation and Relief from the Meteorological Perspective*, proposing to establish a meteorological system for disaster prevention, mitigation and relief in the new era and clarifying the implementation of “Seven Key Actions” for disaster prevention, mitigation and relief from the meteorological perspective.

(II) Enhancing Basic Adaptation Capacity Building

Enhancing infrastructure construction. Construction of key projects for river regulation was strengthened, construction of key water resources allocation projects and key water source projects was pushed forward, and basin-based flood and drought disasters prevention capacity and water supply guarantee were improved. Full efforts were exerted to improve weak links of water conservancy as more than 20,000 kilometers of rivers were regulated, 5,400 plus small dangerously weak reservoirs were strengthened, and drainage capacity was built in 13 key waterlogging regions and 37 areas liable to waterlogging. The national key projects of water and soil conservation such as promotion of comprehensive cleansing of small basins, comprehensive improvement of slope farmland and construction of ecological-clean small basins were accelerated in regions with serious water and soil loss. From 2017 onwards, comprehensive management of water and soil loss in an area of 24,000 square kilometers was implemented and 600 ecological-clean small watersheds built up accumulatively. Fire resistant ability was strengthened. There are 1,148 grassland fire resistant agencies above county level across the whole country, 7,000 plus emergency teams and 190,000 plus full-time and part-time firefighting staff. Nearly 20,000 person-times of fire risk identification staff are dispatched on average a year, and 24-hour extinguishing rate of fire disasters remains above 95%.

Enhancing scientific and technological ability. The research and development of global and regional climate modes was carried out constantly, the research of climate change forecasting was continued, comprehensive impact assessment models were researched and developed, and important progress was obtained in the monitoring and attribution of regional average temperature and extreme temperature changes of China. The pre-assessment system for quasi-service-oriented pilot operation of abnormal gale and

rainfall's impact on China's offshore eco-environment and the decision support system for demonstrative gulfs were established, the arctic sea ice service forecasting system was improved, and the promotion of coastal process research and the popularization of beach protection technology were continued. A dynamic monitoring demonstration system for carbon flux and diffusion from terrestrial sources to sea based on satellite remote sensing was established. Analysis and application of satellite radar-based stereoscopic monitoring products were strengthened, and environmental weather forecasting became more detailed. Analysis and application of satellite radar stereo monitoring products were strengthened, and the level of environmental meteorological forecast refinement was improved.

Establishing disaster monitoring and warning mechanisms. The *Notice on Effectively Establishing the Monitoring and Warning Mechanism of National Water Resource Carrying Capacity* was issued. The flood and drought management work responsibility systems with a core of the local chief executive responsibility system was enhanced at all levels. Flood prevention plans, flood regulation plans and emergency water dispatch plans of big rivers were improved. The national drought monitoring system was established preliminarily and 1,021 automatic and manual monitoring stations were built. A scientific survey of regional population-based weather-sensitive diseases was carried out, and forecasting and warning services for child health risks caused by high temperature and heatwave were provided in pilot cities.

III. Local Actions

Since 2017, China has continued to push forward the low-carbon province and city pilots steadily, and intensified the construction of low-carbon communities

constantly. Meanwhile, local governments have proactively explored innovative low-carbon development patterns and carbon emission peaking pathway, and continued to deepen the pilot work in near zero carbon emission, construction of climate-resilient cities, demonstration of low-carbon product certification and carbon capture, utilization and storage (CCUS).

(I) Pilots and Demonstrations at All Levels

Advancing low-carbon province and city pilots steadily. In January, 2017, NDRC approve the implementation of the third batch of low-carbon city pilots in 45 cities (districts, counties) and requested all pilots make their goals and principles, develop a low-carbon development plan, establish the GHG emission control objective assessment system, explore new experience and practices proactively, and improve the low-carbon development management capacity. The number of low-carbon province and city pilots reached 87 in total.

Intensifying the construction of low-carbon communities constantly. According to incomplete statistics, 400 plus low-carbon community pilots have been carried out in 22 provinces (regions and municipalities) from 2017 onwards. In specific, most provinces developed a work plan for the implementation of low-carbon community pilots, Beijing, Shanghai, Hebei, Jiangxi, Hubei, Guangxi and Shaanxi released assessment indicators or pilot plan formulation guidelines for community pilot construction, and some provinces issued the supportive low-carbon community assessment indicator system. On the basis of the selecting and establishment of low-carbon demonstration communities that had been completed, Shanghai Municipality selected 4 low-carbon demonstration communities, and carried out the establishment of the second batch of low-carbon community pilots.

(II) Innovative Local Actions for Low-Carbon Development

All local governments probed into the innovation of low-carbon development proactively, and strengthened basic capacity building. On the basis of the formulation of the work plan for GHG emission control during the 13th FYP period in all provinces (regions and municipalities), the cities including Ankang, Wuhan, Lu'an, Chengdu, Liuzhou, Qingdao, Yuxi, Yinchuan, Hefei, Shenyang, Sanya, Gongqingcheng, Changzhou, Jiaxing, Guangyuan etc., formulated and released their respective low-carbon development plan or low-carbon development implementation scheme. Hangzhou, Ningbo, Wenzhou, Jiaxing, Jinhua and Quzhou established the regulatory mechanism of GHG emission inventory compile at municipal and county levels. Beijing, Zhenjiang and Wuhan advanced steadily the carbon emission assessment mechanism for the energy conservation auditing of investment of fixed asset projects. Lanzhou took the lead to establish the “1+5” low-carbon city comprehensive management service platform covering environmental protection, energy conservation, resource, transport, low carbon and other fields. Nanjing carried out the research on low-carbon development promotion law. Such provinces and cities as Guangdong, Wuhan, Changsha, Shenzhen, Luoyang and Chengdu continued to probe in the carbon Generalized System of Preferences (GSP).

(III) Proactive Promotion of Carbon Emission Peaking in Many Regions

As of June, 2018, 9 provinces (regions and municipalities) including Beijing, Tianjin, Shanxi, Shandong, Hainan, Chongqing, Yunnan, Gansu and Xinjiang presented a specific timeframe of overall carbon emission peaking in their respective implementation scheme or plan for GHG emission control during the 13th FYP period. In specific, Beijing proposed to peak by 2020 and as early

as possible, Tianjin around 2025, Yunnan around 2025 and Shandong around 2027. Shanghai proposed in the *Shanghai Urban Master Plan 2017-2035* to reach the peak of carbon emissions prior to 2025. Though some provinces (regions and municipalities) not giving a specific peaking time as a whole, they presented peak targets for key regions, pilot cities or key industries according to their respective conditions, and carried out the research on the peaking of carbon emissions. For instance, Jiangsu proposed to support optimal development zones of Suzhou and Zhenjiang to take the initiative to reach the peak of carbon emissions prior to 2020, Guangdong proposed Guangzhou, Shenzhen and other developed cities to peak by 2020, Jiangxi proposed some heavy chemical industries strive to reach the peak of around 2020, and Sichuan proposed some heavy chemical industries reach the peak of carbon emissions together with the same industries on national level around 2020. In addition, most low-carbon pilot cities also presented specific peaking targets in their respective pilot scheme. As of October, 2017, a total of 73 low-carbon pilot provinces and cities, including 28 pilot provinces and cities in the first group and the second group and all of the 45 pilot regions in the third group, had presented the carbon emission peaking target in different ways.

(IV) Pilots and Demonstrations in Other Areas

Building the near-zero carbon emission zone demonstration project. Relevant Chinese research institutions researched the main idea, basic principles, implementation scheme and supporting policies for the near-zero carbon emission zone demonstration project, and carried out field study. Many local governments advanced relevant work proactively. Shaanxi, Guangdong and Zhejiang launched relevant work of the near-zero carbon emission zone demonstration project at the provincial level, and Guangdong, Zhejiang and Hainan selected and assessed relevant demonstration projects.

Pushing forward the climate adaptation city pilots. In 2017, NDRC and

MOHURD released the *Notice on Launching the Pilot Program of the Construction of Climate Adaptation Cities*, and implemented the pilot program of the construction of climate adaptation cities in 28 regions, with the aim to proactively probe into the planning, construction and management modes for climate change adaptation on city level according to local conditions, form a series of duplicable and transferrable pilot experiences, and play a guiding and demonstrative role. In 2017, NDRC and MOHURD held, in conjunction with the World Bank (WB), the Asian Development Bank (ADB) and other international organizations, the International Workshop on Climate Change Adaptation Pilot Cities in Lishui and Changde respectively, in which the departments of all provinces and municipalities in charge of climate change adaptation and relevant international organizations and research institutions were present at the meetings to share climate change adaptation experience and explore the thought of pilot city construction.

Promoting experiment and demonstration of CCUS. Efforts were made to boost the research, experiment and demonstration of CCUS steadily. In 2017, former Department of Climate Change of NDRC and ADB signed the *Memorandum of Understanding for A Technical Assistance to Support A Large-Scale CCUS Demonstration Project in China*, carrying out strategic and techno-economic assessment of CCUS demonstration and providing feasibility research support for the large-scale project with a yearly capture capacity of 1 million tons of CO₂ in Yanchang Petroleum Group. China Resources Group (CRP) and UK-China (Guangdong) CCUS Center jointly launched the Project of CRP Haifeng Power Plant Carbon Capture Test Platform in 2017 and started construction in 2018. Shenhua Group completed the technology research and development and system integration technology research and development for the oxygen-enriched combustion-based megaton-level carbon capture power plant. According to preliminary statistics, China had built up or operated about 13 CCUS demonstration projects above ten thousand tons as of the end of

2017.

IV. Broad Social Participation

Since 2017, the Chinese government has strengthened guidance, gave play to the role of media, raised public awareness and encouraged enterprises and citizens to take active actions, thus forming a green and low-carbon development pattern with multi-participation.

(I) Active Government Guidance

NDRC and relevant departments carried out the National Energy Conservation Publicity Week with the theme of “conserve energy, reduce consumption and protect the blue sky”. MEE and relevant authorities carried out the thematic practice activity with the theme of “Beautiful China, I’m the Practitioner” and the national low-carbon day publicity activity with the theme of “Increase Climate Change Awareness, Strengthen Low-Carbon Action”, and released the *Standards of Civil Ecological Environmental Behavior (for Trial Implementation)*. The Organizing Committee for Beijing Winter Olympic Games gave assistance to hold relevant activities. The general public was advocated to choose simple, moderate, green and low-carbon lifestyles, mobilized to take part in low-carbon actions, as well as trained to lead a new fashion of low-carbon development. The Ministry of Education (MOE) guided students to take an active part in the practice of energy conservation and emission reduction and improved the low-carbon and environment-friendly humanistic and scientific quality of the vast number of adolescents through holding the Eleventh National University Student Social Practice and Science Contest on Energy Saving & Emission Reduction and carrying out the

propaganda activity with the theme of “Co-build an Energy-Saving Campus”. The Ministry of Science and Technology (MOST) aimed to improve the action awareness of using energy-saving and low-carbon innovative products across the whole society through publicizing and promoting scientific and technological innovation on energy conservation and emission reduction. MIIT promoted the energy-saving services to enterprises so as to conserve energy, reduce consumption, lower cost and improve efficiency. MOHURD carried out a series of activities of promoting green building in communities and homes, publicized laws, regulations, technical measures and common senses about building energy conservation and green building through advocacy boards and platforms such as Weibo and WeChat, and improved the green life awareness of residents. MOT organized the 2018 green commuting month and bus trip week, and generalized the concepts and measures of public transport priority and green commuting proactively. The Ministry of Commerce (MOFCOM) released the *Notice on Effectively Conducting the Work on Green Circular Consumption in 2018* and issued the *Opinions on Promoting the Development of Green Catering* to carry out the initiative of “Reduction of Plastic” in shopping malls and promote the development of green catering. The National Government Offices Administration (NGOA) pushed forward energy conservation in public institutions through organizing the fifth session of the remote training on energy-saving management of public institutions and the activity of “Demonstration and Guidance of Simplicity, Moderation, Greenness and Low-Carbon—Publicity and Demonstration of Energy and Resources Conservation in Public Institutions”, and releasing the list of contract energy management transformation projects of one hundred public institution buildings and the green commuting initiative for public institutions.

(II) Broad Public Participation

The State Information Center (SIC), the National Center for Climate Change

Strategy and International Cooperation (NCSC) and the Green Commuting Fund of China Association for NGO Cooperation (CANGO) jointly held the activity of “Low-Carbon in China 2018” to publicize local good practice of low-carbon development, step up the low-carbon development awareness in all sectors of the society and promote public participation in climate change actions. The Public Meteorological Service Center of CMA carried out, in conjunction with SIC and other organizations, the scientific investigation and scientific knowledge popularization activity with the theme of “Addressing Climate Change · Recording China—A Sight of Ili”, witnessing climate change from the scientific perspective and publicizing the fight against climate change to the general public. China Green Carbon Foundation (CGCF) held the eighth tree-planting public benefit activity named “Low-Carbon Action for a Green Homeland”, promoting all people’s voluntary participation in climate change actions through the new method of carbon sink afforestation. At the Global Climate Action Summit held in California, the U.S. in 2018, 10 commonweal organizations, foundations and research institutions including Lao Niu Foundation jointly originated the Global Climate Action Initiative. Center for Environmental Education and Communications of former MEP held thematic training sessions on climate change in the environmental system so as to improve the understanding and recognition of climate change in the environmental system. The Innovative Research Institute of Science Popularization, Shenzhen held the Third Shenzhen (International) Climate Change Film Festival, collecting film and television works from across the world and improving the public awareness of climate change. Friends of Nature guided public attention to low-carbon development by establishing the low-carbon exhibition gallery.

(III) Proactive Enterprise Exploration

Clean energy was adopted and the green development concept was

implemented in the energy industry. State Grid built up the first clean power station containing wind energy, solar energy and energy storage. Research and development of new materials and new techniques was pushed ahead proactively in the transport industry. For instance, CRRC Corporation Limited manufactured the new-generation metro vehicle “CETROVO” using lighter and more energy-efficient carbon fiber composites. Cross-border cooperation was witnessed between banking and internet enterprises to probe into the practice of new low-carbon measures. For instance, Shanghai Pudong Development Bank (SPD Bank) and Tencent worked together to carry out the large-scale public benefit activity of “WeChat Green Commuting Week”. In the automobile industry, active efforts were made to advocate and transmit green concept and pioneer the upgrading of emission reduction. For instance, Weichai joined hands with BOSCH launching the initiative of “resolutely winning the battle for the blue sky”, with the aim to call upon the whole industry to make joint efforts to realize green development.

(IV) Extensive Media Publicity

Xinhua News Agency, People's Daily, China Central Television (CCTV), China News, Guangming Daily, China Environment News, China Energy News and many other Chinese media brought into full play the advantages of traditional media including television, broadcasting and newspaper to enhance the publicity of all climate-related activities through actively using network, WeChat, Weibo and other new media. CNR News and other media probed into the trend and impact of climate change from the perspectives of public participation, public opinion and policy advocacy and called on the public attention to environment-friendly and low-carbon life through reporting the “2018 Hi Climate Summit”. Many media such as Xinhua News Agency, Guangming Online, Weather China and China Meteorological News participated in the initiative of the combined action of “China Weather •

Low-Carbon Economy—Co-build a Beautiful China” in response to the call of “Building a Beautiful China”. At the Global Climate Action Summit held in California, U.S. in 2018, Chinese and foreign media publicized and reported China’s policies and actions to address climate change, demonstrating China’s effectiveness in address climate change to the world.

V. Improvement of Systems and Mechanisms

Since 2017, the Chinese government has obtained a series of positive achievements in strengthening plan implementation, improving systems and mechanisms, carrying out GHG emission control target responsibility assessment at provincial level, enhancing laws, regulations and standards and promoting the construction of carbon emission trading markets.

(I) Improving Systems and Mechanisms

Improving climate change systems and mechanisms. In April, 2018, according to the institutional reform arrangement of the Chinese government, the function of addressing climate change and emission reduction was transferred to the newly founded MEE. In July 2018, the State Council adjusted the composition and personnel of the national leading group on climate change, energy conservation and emission reduction in accordance with the institution setting, personnel changes and work requirements of the State Council. To implement the *Work Plan for Greenhouse Gas Emission Control during the 13th FYP Period*, local governments deployed relevant work proactively. As of June, 2018, 31 provinces (regions and municipalities) had all released the schemes or plans for GHG emission control during the 13th FYP period at provincial level, and in specific, 25 provinces (regions and municipalities) had

released their respective work plans for GHG emission control during the 13th FYP period and 6 provinces (regions and municipalities) had made arrangements on the work concerning GHG emission control during the 13th FYP period in the form of plan, scheme or opinion.

Carrying out yearly GHG emission control target responsibility assessment and examination of provincial governments. In 2017, NDRC completed, in conjunction with relevant departments, the 2016 examination and assessment of GHG emission control target responsibility of all provinces (regions and municipalities). According to the result, 27 provinces (regions and municipalities) had obtained the goal of yearly reduction of carbon intensity. In 2018, MEE and relevant departments completed the 2017 examination and assessment of GHG emission control target responsibility of all provinces (regions and municipalities).

(II) Enhancing Laws, Regulations and Standards

Promoting climate change legislation. Policy and standard systems and environmental judicature systems for climate change improved continuously, providing policy and institutional support for improvement of climate change laws and regulations. At national level, the Climate Change Law and the Interim Regulations for the Administration of Carbon Emission Trading are under drafting and the *Interim Measures for the Administration of the Clean Development Mechanism Projects*, *Measures for the Administration of the China Clean Development Mechanism Fund*, *Interim Measures for the Administration of Voluntary Greenhouse Gas Emission Reduction Transactions* and *Interim Measures for the Administration of Carbon Emission Permit Trading* that had been issued were formulated and amended steadily. At local level, the Regulations on the Promotion of Low-Carbon Development of Nanjing City was included into the 2018 legislation plan of Nanjing municipal government, implementation of the *Regulations on the Promotion of*

Low-Carbon Development in Shijiazhuang and Nanchang was continued, and laws and regulations on carbon emission trading in all pilot regions of carbon emission trading continued to be valid during the transitioning period of the construction of the national carbon market.

Pushing ahead climate change standardization. The work on national carbon emission standard and low-carbon product identification and certification was promoted proactively in accordance with the new requirements of the amended *Standardization Law*. Up to now, SAC has approved 16 national standards on carbon emission management, covering the accounting and reporting requirements for GHG emissions from key production enterprises in power generation, steel and cement sectors. The exposure drafts of 14 national standards including the *Requirements of the Greenhouse Gas Emissions Accounting and Reporting—Refinery and Petrochemical Enterprise* were released. As of July, 2018, NDRC had recorded successively 12 groups of 200 project-based carbon emissions reduction accounting methodologies, covering industry, electricity, energy, building, agriculture and many other key sectors. CNCA completed and released the *General Specification for Greenhouse Gas Emission Verification of the Organization*. In 2017, NDRC, former AQSIQ and CNCA jointly released the certification catalogue of the third group of low-carbon products. In 2017, China Quality Certification Center (CQC) formally acquired the accounting qualification of carbon emission trading in the aviation sector in the European Union (EU), and became the only Chinese agency with the accounting qualification of carbon emission trading in the EU.

(III) Promoting the Construction of Carbon Emission Trading Markets

Steadily pushing ahead the construction of the national carbon emission trading market. In December, 2017, NDRC issued the Scheme for the

Construction of the National Carbon Emission Trading Market (for the Power Generation Industry), and held the video and telephone conference on the kick-off of the national carbon emission trading system to mobilize and deploy the task of building the national carbon market. It requested a national carbon market with clear ownership, strict protection, smooth circulation, effective regulation and open and transparent operation be built in phases and step by step, starting from the power generation sector in accordance with the general principle of “seeking progress in stability”. NDRC organized extensive discussion on the Interim Regulations on the Administration of Carbon Emission Trading, formed legislative proposals and further carried out legislation inspection in conjunction with the legislation department of the State Council. Active efforts were made to research and develop the administration measures of carbon emissions reporting, administration measures of the carbon emission trading, technical guideline for the distribution of quotas in power generation sector and other supporting regulations and technical specifications.

Continue to promote the construction of pilot carbon markets. Beijing, Tianjin, Shanghai, Chongqing, Guangdong, Hubei and Shenzhen have formed basically pilot carbon emission trading markets with well-formed elements, steady operation, evident effect and characteristics. The 7 pilot carbon markets cover nearly 3,000 key emission units in many industries like electricity, steel and cement, and their agreement fulfillment rate remains high and is on a year-on-year rise. Shanghai pilot carbon market realized the 100% agreement fulfillment in key emission units for the 5th consecutive performance periods, and covered enterprises saw a 7% decline in carbon emission and 11.7% decline in coal consumption compared to 2013. Through improving the low-carbon awareness of enterprises, pilot carbon markets gave a powerful push to the declines in carbon emission and intensity within the pilot regions. By the end of October, 2018, the 7 pilot markets completed a cumulative

trading volume of above 250 million tons and a cumulative turnover of about 6 billion RMB.

Developing the carbon GSP in an innovative way. Guangdong Province issued the *Implementation Plan for the Pilot Program of the carbon GSP of Guangdong Province, Guidelines for the Pilot Construction of the carbon GSP of Guangdong Province, Interim Measures for the Administration of Pu Hui Certified Emission Reductions (PHCER) and Rules for PHCER Trading of Guangdong Province*, implemented the carbon GSP in Guangzhou, Dongguan, Zhongshan, Huizhou, Shaoguan and Heyuan, and established the quantification method and trading mechanism for carbon GSP behaviors with the focus on Carbonemissiontradecoin (CT) and PHCER. Beijing carbon market carried out the activity with the theme of “I Volunteer to Drive a Day Less Each Week”, and encouraged green commuting of the general public through the carbon GSP. The “I Volunteer to Drive a Day Less Each Week” platform was put into operation in June, 2017. As of the end of August, 2018, it had registered 118,000 users, and reduced carbon emissions by over 22,000 tons cumulatively and as many as 70 tons a day.

VI. Strengthening Basic Capacity

Since 2017, the Chinese government has continuously improved the basic capabilities to address climate change by further strengthening the construction of the statistical and accounting system, accelerating the research, development and application of low-carbon technologies and proactively promoting talent and discipline construction.

(I) Enhancing the Construction of the GHG Statistical and Accounting System

Improving the basic statistical system for GHG emissions. Implementation of the *Opinions on Strengthening the Statistics for Addressing Climate Change* continued. NDRC, NBS, MEE and other departments carried out construction of the climate change statistical indicator system and the green development indicator system, and established and improved investigation systems related. In 2017, the reduction rate of CO₂ emission per unit of GDP was included for the first time into the *Statistical Communique of the People's Republic of China on the 2017 National Economic and Social Development*. NBS has included the reduction rate of CO₂ emission per unit of GDP into the Green Development Indicator System for comprehensive evaluation of the overall situation of green development in various regions. The national government provided guidance for the training of climate change statistics in provinces (regions and municipalities), and promoted local governments to establish the statistic and reporting of basic data for carbon intensity calculation through the yearly GHG emissions control target responsibility assessment at provincial level. Some provinces and municipalities have established the institutional construction and working system for climate change statistics, and statistical departments of 27 provinces (regions and municipalities) have been provided with full-time staff responsible for statistic and accounting on climate change.

Advancing GHG inventory compilation and emissions accounting. Based on the first and second National Communication on Climate Change and the first Biannual Update Report on Climate Change, MEE organized relevant departments and experts to complete the preliminary compilation of the third National Communication on Climate Change and the second Biannual Update Report on Climate Change. 31 provinces (regions and municipalities) completed the compilation of the 2012 and 2014 provincial GHG inventories,

and 14 regions formulated the provincial GHG inventories of other years.

Pushing ahead the construction of the direct reporting system for corporate GHG emissions data. In 2017, the *Notice on Efficiently Launching the Carbon Emission Reporting and Accounting and Emission Monitoring Planning of 2016 and 2017* was released by NDRC, requesting the eight key industries covered in the carbon emission trading system carry out 2016-2017 reporting of corporate GHG emissions data, and emissions data of more than 3,100 key enterprises have been collected. Some local departments further carried out the reporting of GHG emissions data of general corporates within their respective jurisdiction on the basis of meeting data reporting requirements of relevant national departments and according to their respective administrative requirements. NCSC has preliminarily built up a direct reporting system for corporate GHG emissions data, and provided training to 1,800 person-times of submission staff. 28 provinces (regions and municipalities) have built up the provincial-level reporting system for corporate GHG emissions data, which has been put into use in 17 regions.

(II) Enhancing Science and Technology and Team Support

Strengthening scientific and technological support. In April 2017, MOST, former MEP and CMA jointly issued the *Special Plan for Science and Technology Innovations in Addressing Climate Change in the 13th FYP Period* to systematically deploy the science and technology to address climate change. In 2017, NDRC released the *Catalogue of National Key Energy-Efficient and Low-Carbon Technologies for Promotion (2017 Version, Low-Carbon Section)*, including 27 low-carbon technologies for national key promotion in non-fossil energy, fuel and raw material substitution, industrial process, non-CO₂ emission reduction, CCUS, carbon sink and other fields. In January, 2018, the State Council released the *Several Opinions of the State Council on Comprehensively Strengthening Basic Research*, deploying the enhancement of

basic research in all aspects. MOST strengthened its deployment around five aspects, including the mechanism and model of global climate change, impact and adaptation, mitigation, observation and data platform construction, and strategic research. In 2018, MOST, Chinese Academy of Sciences (CAS), CMA and Chinese Academy of Engineering (CAE) jointly led the compilation of the *Fourth National Assessment Report on Climate Change* together with NDRC and MOE. CMA released the *Blue Book of Climate Change of China*, releasing the latest monitoring information of climate change in China, Asia and the world. CMA continued to participate in the work of the Intergovernmental Panel on Climate Change (IPCC) and actively organized the participation in drafting the *Special Report on Global Warming of 1.5 °C*. MWR conducted researches on the mechanism through which natural and human activities affect the terrestrial water circulation of the earth system, the attribution and quantitative recognition of runoff changes in different climatic regions under changing environment, and the strategies and measures for urban flood disaster prevention and control under changing environment. The National Climate Change Expert Committee fully play its role of expert consultancy through organizing seminars on major issues related to climate change and forming a number of consulting reports.

Strengthening talent team construction. NDRC continued to deepen the training of capacity building for addressing climate change, held the second training class of national actions and capacity building to address climate change for middle and high-level cadres of the national development and reform system, and trained about 50 person-times of front-line cadres for addressing climate change. NGOA convened the 2018 workshop on energy-saving publicity in public institutions, with the participants of 53 people from local government offices administration bureaus and departments directly under central state organs. CMA launched courses and training sessions to address climate change scientifically and about ecological civilization.

Strengthening relevant discipline construction. MOE encouraged colleges and universities to set climate change majors by themselves according to social and economic development needs and school capacity, and secondary and higher education institutions to step up the construction of environment and climate change education research bases. The Institute of Climate Change and Sustainable Development of Tsinghua University was founded in 2018. The Introduction to the Science of Climate Change and other curriculum were opened successively in CAS, Peking University, Tsinghua University, Sun Yat-Sen University, Nanjing University of Information Science & Technology, Nanjing University, Lanzhou University, Beijing Normal University and other colleges and universities.

VII. Active Involvement in International Negotiation

Since 2017, the Chinese government has continuously played a positive and constructive role in international negotiation on climate change with a highly responsible attitude, strengthened multi-level consultations and dialogues on climate change with all countries and promoted relevant parties to build consensus, playing an important role in promoting global climate governance and deepening international cooperation to address climate change.

(I) Taking an Active Part in Multilateral Processes under the UN Framework

Profoundly participating in global climate governance and implementing the outcomes of the *Paris Agreement*. The Chinese government has always taken an active part in the follow-up negotiations related to the *Paris Agreement*, promoted the establishment of an equitable, rational, cooperative

and win-win global climate governance system and played a positive and constructive role in the Bonn Climate Change Conference (COP23) and other dialogues and consultations on climate change. In January, 2017, President Xi Jinping said at the World Economic Forum that the *Paris Agreement* is in line with the direction of global development and its outcomes are hard-won, and we should stick together and not give up easily. This is our responsibility for future generations. President Xi Jinping delivered a speech, *Work Together to Build a Community of Shared Future for Mankind*, at the UN Office at Geneva, saying the conclusion of the *Paris Agreement* is a milestone in the history of global climate governance, and all stakeholders should work together to push forward its implementation so that the achievement won't be wasted.

Constructively participating in the main-channel negotiation of the UN Framework Convention on Climate Change (UNFCCC). Against the backdrop of uncertainty in the multilateral process of climate change, China demonstrated the actions in promoting ecological civilization proactively, and manifested the positive will to further promote global climate governance. In the negotiation, China actively promoted consensus on important items, firmly safeguarded the principle and framework of the UNFCCC, adhered to the principle of equity, “Common But Differentiated Responsibilities” and respective capabilities, joined hands with relevant parties to promote follow-up negotiations on relevant items for the implementation of the *Paris Agreement*, and strengthened the comprehensive, effective and continuous implementation of the UNFCCC and the *Paris Agreement*.

(II) Taking an Extensive Part in Other Multilateral Processes

Proactively participating in international processes on climate change outside the UNFCCC. China has taken an active part in the negotiations related to climate change in other channels than the UNFCCC such as the Petersburg Climate Dialogue, G20 meetings, Montreal Protocol, International

Civil Aviation Organization (ICAO) and International Maritime Organization (IMO), and continued to follow the activities and discussions related to climate change in other occasions such as United Nations General Assembly, Asia-Pacific Economic Cooperation (APEC) and BRICS meetings. In September 2017, China co-sponsored with the EU and Canada and held the first ministerial meeting on climate action in Montreal, Canada. In June, 2018, China held, together with the EU and Canada, the second ministerial meeting on climate action in Brussels, with the aim to further build consensus of all parties and inject new political momentum to multilateral processes of climate change while the global process on addressing climate change is increasingly uncertain. In September 2018, China, as a founder party, jointly established the Global Adaptation Committee and promoted positive progress in the international cooperation on climate change adaptation and global adaptation action.

Strengthening dialogue and exchange with other countries. China host the 24th and attended the 25th and 26th BASIC Ministerial Meeting on Climate Change and published the joint declarations, and joined hands with large developing countries to make voice and promote the multilateral process. China continued to participate in consultation mechanisms such as Like-Minded Developing Countries, proactively had dialogues with Small Island Developing Countries, Least Developed Countries and African Group, and safeguarded the benefits of developing countries. China continued to deepen the dialogue and communication with developed countries, strengthen climate change cooperation between China and the EU, promote policy dialogue and interaction with Germany, New Zealand, Australia and Canada, etc., and improved understanding and expanded consensus with relevant parties so as to jointly make contributions for strengthening international climate dialogue and cooperation. In December, 2017, Vice Premier Ma Kai of the State Council attended, as a special envoy of President Xi Jinping, the One

Planet Summit held in Paris, France, and delivered a speech “Implement the *Paris Agreement* Steadfastly, Work Together to Build a Clean and Beautiful World”.

(III) Basic Standpoints and Propositions of the Katowice

Climate Change Conference

The UN Climate Change Conference (COP 24) to be held in Katowice, Poland in December, 2018 should emphatically complete work in following four aspects: Firstly, completing the negotiation on the detailed rules for the implementation of the *Paris Agreement* on schedule should be taken as the core task, and it should stick to the regulations of the *Paris Agreement*, and assure that the principles of equity, “Common But Differentiated Responsibilities” and respective capabilities are embodied in the details of the implementation of the *Paris Agreement*. Given different national circumstances, it should assure that follow-up arrangements embody the balance of all achievements and cover all elements including mitigation, adaptation, financing, technology and capacity building. Secondly, “implementation” should be taken as a major orientation of the conference, and it should promote all parties to fulfill all promises and actions prior to 2020 so as to lay a mutual-trust foundation for the implementation of the *Paris Agreement* after 2020. The international community should promote the *Doha Amendment to the Kyoto Protocol* to enter into force as early as possible. Thirdly, at Facilitative Dialogues, green and low-carbon transformation should be taken as an important signal of the conference so as to promote all parties to exchange best practice, exploit action opportunities and push ahead international cooperation in a mutual-trust, honest-treatment and win-win-cooperation atmosphere, and send to the international community a positive signal that all parties will work together to implement the *Paris Agreement* to address climate change, promote the global green and low-carbon transformation and build a Community with a Shared

Future for Mankind. Fourthly, settling financial problems should be taken as a sally port for the success of the conference. The High Level Conference on Finance should gather political impetus for solving financing problems to address climate change, and developed countries should provide more detailed information on the implementation of each year's 100 billion USD commitment prior to 2020 so as to satisfy rational appeals of developing countries on all climate financing items.

VIII. Enhanced International Exchanges and Cooperation

In the principle of “mutual benefit, win-win, pragmatic and effective cooperation”, the Chinese government actively carried out practical cooperation with interested parties on climate change and green and low-carbon development, promoted the South-South cooperation on climate change proactively, and played a positive and constructive role in global cooperation to address climate change.

(I) Promoting Cooperation with International Organizations

China conducted pragmatic cooperation with international organizations and became actively involved in relevant international conferences and initiatives. It further enhanced cooperation with such multilateral organizations as the WB, ADB and United Nations Development Program (UNDP). China also actively participated in 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 and low-carbon development. MEE held the climate change bilateral cooperation mechanism meetings together with many countries such as New Zealand, Germany, France and Canada, with the aim to exchange opinions on their respective policy actions and the consolidation of bilateral cooperation on climate change. During the Sino-EU Leaders' Meeting in July 2018, the China-EU Joint Statement on Climate Change and Clean Energy was issued. In December 2017, Premier Li Keqiang and Canadian Prime Minister Trudeau issued the China-Canada Joint Statement on Climate Change and Clean Growth. Effective cooperation was carried out with many countries, including the U.S., the EU, France, Germany, the U.K., Canada and Japan, in such areas as carbon market, low carbon cities and climate change adaptation. In July 2018, MOST and the German Federal Ministry of Education and Research signed the *Joint Statement on Potential Deepening Cooperation on Climate Change Research*. In September, 2018, the Chinese delegation attended the Global Climate Action Summit held by the government of the State of California in San Francisco, U.S., and had extensive communications on climate change actions with local governments, enterprises and social organizations of the U.S.

(III) Deepening South-South Cooperation on Climate Change

China actively pushed forward the South-South cooperation on climate change, and helped other developing countries to improve their capacities on addressing climate change by carrying out climate change mitigation and adaptation projects, donating energy-efficient and low-carbon materials and

monitoring and warning facilities, and holding climate change South-South cooperation training workshops. As of April, 2018, NDRC has signed MOUs on cooperation with 30 developing countries, and donated to them materials and equipment to address climate change such as remote sensing microsatellite, energy-saving lamps and household solar power generation systems. Many training workshops for South-South cooperation on climate change were held, and hundreds of number of places for climate change training were provided to relevant developing countries. In 2017, the climate change training course was held during the Belt and Road Forum for International Cooperation. MOFCOM has cumulatively offered assistance to more than 80 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.