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Challenges for Geographers in the International Negotiations on Climate Change—China Dimension

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Abstract: The *Paris Agreement*, reached in 2015, established a new mechanism for countries around the world to join efforts to respond to climate change and commenced a new stage of global governance of climate change. However, the United States' withdrawal from the *Paris Agreement* has presented new challenges to global climate governance and, in particular, compounded the deficiencies in emission reductions, finance, technology, and leadership. China is faced with relatively strong pressure in international negotiations. According to carbon emission data published by 11 main research institutes around the world, China's carbon dioxide (CO_2) emissions increased rapidly with economic development. The proportion of China's CO_2 emissions to total global CO_2 emissions increased from 10.9% to 27.1% from 1990 to 2017. Additionally, China's per capita CO_2 emissions increased from 2.1 t in 1990 to 6.98 t in 2017. Large volumes of CO_2 emissions are related to China's economic and energy structures. China aims to realize basic modernization by 2035 and full modernization by 2050. Facing these two time points, China needs to focus on low-carbon economic development, and economic structure, technological support, and regional allocation are important areas. The recommendation is that Chinese geographical circles strengthen research in areas such as fundamental science, international geopolitics, climate and environmental economics, and new energy technologies to improve China's discourse and soft power and provide a theoretical basis and practical example for the country to advocate a new global governance concept and build a community with a shared future for humankind.

Keywords: climate negotiation; emission data; geography; strategic thinking; China

1 Introduction

International negotiations on climate change continued for more than 20 years since the United Nations (UN) General Assembly passed the UN Framework Convention on Climate Change (UNFCCC) in 1992[1]. Negotiation meetings have been held in a number of cities around the globe, including Kyoto (1997), Bali (2007), Copenhagen (2009), Durban (2010), Warsaw (2013), and Paris (2015). The Chinese government and academic circles have attached great importance to the UN Climate Change Conferences. Chinese government offi-

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cials attended each of these conferences and their side events. The former prime minister of the State Council of China, Wen Jiabao, attended the 2009 UN Climate Change Conference in Copenhagen. President Xi Jinping attended the 2015 UN Climate Change Conference in Paris. The author has closely followed international negotiations on climate change and has participated multiple times in negotiation meetings.

Global environmental and climate change has been widely recognized by various countries throughout the world. In nearly one century (1909–2011), China's average land temperature increased by 0.9–1.5 °C, more than the global level. Additionally, climate change-related disasters in China have also occurred at higher frequencies and intensities[2]. Climate change is a global problem that presents an increasingly prominent nonconventional security threat. Various countries around the world have been jointly discussing strategies and courses of action for tackling climate change. These efforts have ultimately led to the establishment and implementation of international rules[3]. UN international negotiations on climate change should become an important central topic that Chinese geographical circles cannot afford to overlook. Currently, several issues in international negotiations on climate change merit attention from Chinese geographical circles, namely: (1) the political and economic environment for international negotiations on climate change; (2) a comparison of international carbon emission data; (3) the pressure faced by China in international negotiations on climate change; and (4) the path that China should take in the future.

2 Political and Economic Environment for International Negotiations on Climate Change

2.1 UN Climate Change Conferences

UN international negotiations on climate change have continued for more than 20 years. The 24th Session of the Conference of the Parties to the UNFCCC, which took place in Katowice, Poland in 2008, developed a package of achievements, including specifying the details of the implementation of the *Paris Agreement*. In 1988, the UN Environment Program (UNEP) and the World Meteorological Organization (WMO) established the Intergovernmental Panel on Climate Change (IPCC)[4]. The IPCC has published five reports, each of which has exerted an important impact on the political process of climate change negotiations. The first report facilitated the signing of the UNFCCC[5]. The second report aided the signing of the Kyoto Protocol[6]. The third report enabled the introduction of the Bali Road Map[7]. The fourth report injected strong impetus into the UN Climate Change Conference in Copenhagen[8], where a 2 °C temperature limit was established. The fifth report published ahead of the UN Climate Change Conference in Paris set international institutional plans after 2020[9]. The sixth assessment report is currently being prepared. These reports demonstrate that new research results will inevitably play a significant role in facilitating the establishment of future international rules. Scientific research exerts a considerable impact on climate change and international relations, which warrants particular attention.

In October 2018, the IPCC published a special report entitled "*Global Warming of* 1.5 °C"[10], which demonstrated the urgency of tackling climate change to the global audience. Several conclusions can be drawn from this report. (1) Till 2017, the global temperature rose more than 1 °C higher than preindustrial levels. If the current trend continues, the

global temperature increase will exceed 1.5 °C in the period 2030–2052. The global average land surface temperature was 0.87 °C higher from 2006–2015 than from 1850–1900 and increased by 0.2 °C every decade. The land temperature increases were higher than the ocean temperature increases. Additionally, the temperature increases were higher in high-latitude regions than in low-latitude regions. The temperature increase in the Arctic was two to three times the global average level. Anthropogenic greenhouse gas emissions have been continuously affecting the climate system since the Industrial Revolution. (2) To limit the temperature increase to 1.5 °C, global carbon dioxide (CO_2) emissions must be reduced by 45% by 2030 relative to 2010 and must reach net-zero emissions by approximately 2050. At the current emission rate of 4.2×10^{10} t/a, allowable emissions will be used up in a decade. To limit the temperature increase to 1.5 °C, significantly reducing greenhouse gas emissions and transforming land use, energy, industry, construction, transportation, and cities with the aid of emission reduction technologies (e.g., carbon removal) is necessary. For example, by 2050, 70%–85% of the global power supply should come from renewable energy and 8% from natural gas power generation equipped with carbon capture and storage (CCS) technology, whereas almost all of the coal-fired power plants should be made obsolete. (3) Synergistic efforts and trade-offs are required to control the global temperature increase to less than 1.5 °C and achieve sustainable development. Actions taken to control the global temperature increase to less than 1.5 °C are relatively strongly and synergistically linked with sustainable development goals in areas such as human health, clean energy, production, and consumption. For example, compared with 2 °C, controlling the global temperature increase to less than 1.5 °C can more significantly assist in reducing the probability and intensity of extreme events (e.g., high temperatures, heavy rainfalls, and droughts) and reduce the impacts of climate change on sustainable development, poverty elimination, and inequality reduction.

2.2 International Consensus Reached at the UN Climate Change Conference in Paris

The *Paris Agreement* establishes a new mechanism for countries around the world to join efforts to respond to climate change and commenced another stage of global governance of climate change[11]. More than 190 countries and territories signed the *Paris Agreement*. The success of the *Paris Agreement* can be ascribed to a consensus between China and the United States. The *Paris Agreement* mainly has the following eight basic conclusions.

(1) Bottom-up. Negotiations on climate change have transitioned from the past top-down approach to the bottom-up approach. In the past 20 years, the European Union (EU) was the main body and hoped to form an international institutional arrangement and forcibly push it from the international level to the national level. The effectiveness of this approach has been demonstrated to have been not ideal. Thus, the top-down approach was altered to a bottom-up approach in which each country puts forward its own wishes.

(2) All-country participation. In the past, responding to climate change was believed to be the responsibility of developed countries. Today, the responsibility for responding to climate change has been extended to all countries. Each country responds to climate change based on its own capacity. In other words, all of the countries need to participate in tackling climate change.

(3) Nationally determined emission reduction plans. The *Paris Agreement* establishes a new institutional arrangement. Each country determines its own emission reduction plan

based on its capacity and then submits it to an international committee for discussion and, ultimately, assessment. By 2019, each country should present a clear emission reduction plan of its own. To date, 134 countries have put forward their emission reduction plans. A worldwide reassessment of these plans will occur in 2023 to determine the degree of match between the inventory submitted by each country and its capacity.

(4) Stocktaking principle. Stocktaking is a principle in the *Paris Agreement* and is used to assess the progress made by each country in implementing the *Paris Agreement* and its future potential. How should assessments be performed? Currently, intense efforts are being made to study assessment methods, implementation mechanisms, transparency, and statistics; establish assessment rules; and determine how to express assessment conclusions.

(5) Goal of limiting the global temperature increase to 2 °C. The *Paris Agreement* further defines the goal proposed in the 2008 UN Climate Change Conference in Copenhagen of limiting the global temperature increase to less than 2 °C—the global temperature increase should not exceed 2 °C by 2100. Additionally, the *Paris Agreement* sets more aggressive goals of limiting the global temperature increase to 1.5 °C by 2100 and achieving carbon-neutral growth by 2050. In other words, carbon emissions should be completely offset by sequestration by 2050, and zero emissions should be achieved worldwide by 2010, which indicates that the fossil energy era is coming to an end.

(6) Financial support. Financial support is indispensable to achieving the worldwide goal of reducing emissions. Therefore, financial sources are one of the important issues worth considering. In the past, developed countries undertook significant responsibilities for providing financial support. In 2009, then-United States President Obama clearly stated during the UN Climate Change Conference in Copenhagen that developed countries would provide 1×10^{11} USD each year to assist developing countries in implementing emission reduction actions and to establish some means of funding and financing. However, these funds are far from sufficient.

(7) Climate change adaptation. Climate change adaptation and emission mitigation are two wheels of the response to climate change, and they need to move forward simultaneously. Emission mitigation can be achieved through technical and industrial means. How to adapt to climate change is not clearly specified in the *Paris Agreement*. Nevertheless, the *Paris Agreement* specifically discusses risk governance and the need to adequately assess the risk of climate change. However, how to adapt to climate change, how to address the risk of climate change, and how to separate adaptation actions from currently implemented measures are not made abundantly clear in the *Paris Agreement*. Therefore, adaptation-related issues are currently laid aside.

(8) Technology. Technology is the weakest area of the *Paris Agreement*. Developing countries demand that the technology required to tackle climate change be supplied by developed countries. However, developed countries note that the technology is owned by enterprises and is intellectual property, and technology transfer needs to be achieved through a market mechanism instead of the government's administrative orders. Therefore, technology-related issues have yet to be effectively addressed.

2.3 Four Major Deficiencies in the Implementation of the *Paris Agreement*

Each country has designed specific plans for implementing the *Paris Agreement*. Addition-

ally, various institutional arrangements have been made to carry out this agreement. However, under the current new international situation, the implementation of the *Paris Agreement* still faces new challenges[12].

(1) Deficiency in emission reductions. To date, a total of 170 parties have proposed their nationally determined contributions (NDC) schemes that include mitigation targets or actions. Research has demonstrated that even if these schemes are comprehensively implemented, the global temperature will still increase by 2.7–3.1 °C by 2100, which is higher than the limit of 2 °C set in the *Paris Agreement*. If efforts are pursued to further limit the global temperature increase to 1.5 °C, nearly zero global emissions will need to be achieved by approximately 2050, 10–20 years earlier than if targeting a global temperature increase limit of 2 °C.

(2) Deficiency in scientific research and technology. Since the establishment of the IPCC, scientific climate research has been ongoing, and marked progress has been made in observation means, analytical methods, and the methodology for solving difficult uncertainty problems. The IPCC scenario analysis also shows that the majority of emission reduction technologies for achieving deep emission reductions are currently available, but their economic efficiency and competitiveness need to be improved. Judging by the current global industrial structure and technology roadmap, although low-carbon technology has improved rapidly in recent years and its market penetration has increased year-on-year, using this technology to support substantive worldwide emission reductions remains difficult. In particular, major breakthroughs in key technologies (e.g., energy storage, adaptation, carbon sequestration, and geophysical engineering technologies as well as technologies for improving resource use efficiency) are required to lead the revolution in energy production and consumption, science and technology, and institutional mechanisms. To achieve deep global emission reductions, biomass energy with carbon capture and storage (BECCS) has become a key negative emission technology. Negative emissions are required in most scenarios of global temperature increase limits of 1.5 and 2 °C used in the IPCC assessment reports. Therefore, BECCS has been extensively incorporated into these low-emission scenarios. Although BECCS is theoretically feasible, its large-scale use has never been tested. The obstruction to the implementation of BECCS may come from public acceptance and its competition with food production for water and land resources.

(3) Financial deficiency. Item 1 of Article 9 of the *Paris Agreement* clearly states that "developed country Parties shall provide financial resources to assist developing country Parties with respect to both mitigation and adaptation." To achieve this global goal, increasing the scale of financial resources supplied to both mitigation and adaptation actions around the world is necessary. Developing countries need adequate financial support from developed countries to implement their NDCs effectively. Research finds that developing countries need 3×10^{11}–1×10^{12} USD in financial support each year to limit the global temperature increase to 2 °C. According to calculations performed based on historical emissions, the United States should be the leader in providing financial support. However, the United States ceased to fulfill its responsibilities to provide financial support after its withdrawal from the *Paris Agreement*. Its withdrawal will affect other developed countries in their willingness to provide funds and the scale of the funds that they provide. As a result, achieving the goal set in the *Paris Agreement* of raising 1×10^{11} USD through developed countries

each year before 2025 to assist developing countries in mitigating and adapting to climate change will be difficult. Consequently, small-island countries, those that are least developed, and African countries will face greater difficulty in responding to the impacts of climate change and the losses associated with climate change. Currently, although several financing mechanisms (e.g., the Global Environment Facility and the Green Climate Fund) are available, funds raised through these mechanisms are limited, slowing down relevant actions for tackling climate change.

(4) Deficiency in the intensity and direction of guidance on climate governance. Regarding climate change, the EU—once the "climate leader"—has proposed a number of detailed initiatives and suggestions and has never abandoned its ambition to lead global climate governance. However, its efforts are currently impeded by economic and refugee problems as well as internal conflicts. In contrast, the United States withdrew from the *Paris Agreement*. As a result, its influence in the climate field has weakened, and it will not meet its commitments. Although the United States will not easily give up its role as the world's dominant power in a short period, it is failing to take the lead in fulfilling commitments, which gravely affects the intensity and direction of climate governance guidance. Of the developing countries, the "BASIC" countries possess a certain influence. However, a large number of developing-country negotiating blocks exist. Additionally, the political and economic settings, as well as their demands, also vary among developing countries. Consequently, developing countries lack adequate cohesion and fighting power for key issues. Worldwide, the "hegemony of one superpower" in international institutional arrangements no longer exists, whereas multilateralization has become the mainstream trend. This change creates an important opportunity for China to deeply participate in and actively lead global governance. The international community also has high expectations for China to further take a leadership role. Exerting influence and playing a leadership role does not mean that China will have to make contributions beyond what its national conditions and capacity allow and, in particular, share the responsibilities and duties relinquished by the United States. Instead, China will take the lead in continually adhering to the principle of fairness and impartiality in global climate governance as well as adequately reflect and protect its and other developing countries' interest demands.

3 Comparison of Greenhouse Gas Emission Data from Various Research Organizations

3.1 Greenhouse Gas Emission Datasets

There are 11 datasets in the world for calculating the CO_2 emissions (Table 1). The World Bank (WB) and Carbon Dioxide Information Analysis Center (CDIAC) carbon emission data were updated only to 2014. Thus, with the year 2014 as the cross-section, the top 10 countries with the highest energy-related CO_2 emissions (from cement production and fossil fuel burning) according to the data published by the aforementioned 11 organizations were comparatively analyzed based on the statistical metric. The emission data for the same country vary between databases. China's CO_2 emissions (from cement production and fossil fuel burning) are the highest in the Emission Database for Global Atmospheric Research

(EDGAR), at 10,805.77 Mt CO_2, followed by the CDIAC/WB/U.S. Energy Information Administration (EIA) and Global Carbon Atlas (GCA) databases at 10,290.99 and 9,820.36 $MtCO_2$, respectively. China's CO_2 emissions in the GCA database are 90.88% of those in the EDGAR database. Additionally, of the IEA, British Petroleum (BP), and Potsdam Institute for Climate Impact Research (PIK)/World Resources Institute (WRI) databases, China's CO_2 emissions are the highest in the IEA database, at 9,236.79 Mt CO_2, followed by the BP and PIK/WRI databases at 9,206.5 and 8,920 $MtCO_2$, respectively. China's CO_2 emissions in the PIK/WRI database are 96.57% of those in the IEA database. No energy-related CO_2 emission data for China exist in the UNFCCC Annex I (UNFCCC-AI)/WRI and Organization for Economic Cooperation and Development (OECD) databases.

Table 1 Information on main greenhouse gases in international datasets

No.	Organization	Years covered	Number of countries covered	Statistical scope	Assessment method	Data source
1	U.S. EIA[13]	1989–2014	177	Fossil fuel burning	CDIAC methodology	CDIAC
2	WRI[14]	1850–2016	215	Fossil fuel burning	IPCC reference and sectoral methods	Mainly PIK and UNFCCC
3	WB[15]	1960–2014	264	Fossil fuel burning	CDIAC methodology	CDIAC
4	CDIAC of the U.S. Oak Ridge National Laboratory[16]	1989–2014	177	Fossil fuel burning and cement production	CDIAC methodology	Note (1)
5	UNFCCC[17]	1990–2015	41	Fossil fuel burning	IPCC reference and sectoral methods	Governments of various countries and relevant organizations
6	IEA[18]	1960–2016	134	Fossil fuel burning	IPCC reference and sectoral methods	Public resources (e.g., governments and enterprises)
7	OECD[19]	1990–2016	52	Fossil fuel burning	IPCC reference and sectoral methods	Official energy data from more than 150 countries and regions around the globe
8	BP[20]	2007–2018	68	Fossil fuel burning	IPCC reference method	Government and published data
9	PIK[21]	1850–2016	215	Fossil fuel burning	IPCC reference method	UN data as well as data published by enterprises and in articles
10	GCA[22]	1960–2017	220	Fossil fuel burning and cement production	GCA method	Boden *et al*. (2017), UNFCCC, and BP
11	EDGAR[23]	1970–2017	210	Fossil fuel burning and cement production	IPCC sectoral method	*Energy Balance and Statistics* by IEA and *Global Energy Statistics* by BP

Note (1): The pre-1950 data originated from global energy production statistics and international historical statistics; the post-1950 data originated from UN data as well as official data from various countries.

3.2 Impartial Assessment of Carbon Emissions

As one of the issues of greatest concern during the development and evolution of international cooperation on climate change, impartiality is the focus of the research on the allocation of carbon emission quotas and the basis for global cooperation on climate change. Amid climate change, the main principle of the impartial allocation of carbon emission

quotas is reflected in three areas, namely, current emissions, historical emissions, and per capita emissions.

(1) Current emissions

China's CO_2 emissions continue to rise and account for an increasing proportion of total global CO_2 emissions. According to China's *Second Biennial Update Report on Climate Change*[24], China's total CO_2 emissions (excluding carbon sinks, such as carbon stocks in land use, land-use change, and forestry) amounted to 3.07×10^9, 6.38×10^9, 8.71×10^9, 9.89×10^9, and 10.28×10^9 t in 1994, 2005, 2010, 2012, and 2014, respectively. China's total CO_2 emissions in 2014 were 3.3 times those in 1994. The annual average rates of increase in China's total CO_2 emissions were 6.9%, 6.4%, 6.6%, and 1.9% in the periods of 1994–2005, 2005–2010, 2010–2012, and 2012–2014, respectively. Evidently, China's total CO_2 emissions increased rapidly, albeit at a lower rate after 2012. According to the GCA data, in the 28-year period from 1990 to 2017, the proportion of China's CO_2 emissions to total global CO_2 emissions increased from 10.9% to 27.1%. Since 2012, China's CO_2 emissions have been growing at a lower rate and have steadily accounted for approximately 27% of total global CO_2 emissions.

(2) Per capita emissions

The major flaw in assessing a country by total carbon emissions is that this method fails to consider its population. A country with a larger population should be given more emission rights. China's per capita CO_2 emissions increased from 2.1 t in 1990 to 6.98 t in 2017. In 2017, China's per capita CO_2 emissions were far higher than those of India (1.8 t) and Brazil (2.3 t) and were 45.8% higher than the global average, surpassing those of the EU (6.96 t) but still lower than those of South Africa (8.0 t), Japan (9.5 t), OECD countries (9.8 t on average), and the United States (16.2 t).

(3) Historical emissions

Since 1751, the United States and Europe have been leading in cumulative emissions. The United Kingdom was the first country in the world to emit CO_2 on an industrial scale. The CO_2 emissions of other countries in Europe and North America closely followed those of the United Kingdom. During this period, these countries produced the majority of the CO_2. In recent decades, China's CO_2 emissions have been growing rapidly. Nevertheless, China's total cumulative emissions were still lower than 50% of those of the United States. Developed countries' historical emissions during the past two centuries were the main cause of the present increase in the CO_2 concentration in the atmosphere and global warming. From 1870–2017, China's cumulative CO_2 emissions accounted for 13.0% of total global emissions, lower than the proportions of those of the United States (25.8%) and EU (22.3%).

4 Pressure Faced by China in International Negotiations on Climate Change

Now is the decisive moment for taking action to address climate change. The UN will convene a Climate Action Summit in September 2019 to respond to climate challenges. During this Climate Action Summit, each country will show not only its leap in its common political but also large-scale actions implement in the real economy to support the agenda. Each country will need to clearly propose its emission reduction goal for 2030 and clearly reveal its stand. How will China participate and what stand will it take? In recent years, intense meetings and discussions have occurred among like-minded countries. These meetings send

a clear signal that various industries and countries hope to solve local development problems by tackling climate change—this is one of our basic understandings.

4.1 Problems Left by Historical Development

China is faced with multifaceted pressure. The country missed opportunities from the First Industrial Revolution. In 40 years since the beginning of its economic reform, China has only entered the middle stage of the Second Industrial Revolution and has yet to realize postindustrialization. Now, the Third Industrial Revolution era has arrived, and China is at a key stage of deep economic restructuring. To respond to climate change at this time is a significant challenge for China. Therefore, China should primarily focus on doing well in its own affairs.

4.2 Total Emission Pressure

In 2006, China surpassed the United States to become the largest CO_2 emitter in the world. This pressure is the first faced by China. China is also faced with another pressure. In the past, China's per-unit-gross domestic product (GDP) emissions were very low, suggesting that China's industrial and economic production was very extensive. China's per-unit-GDP emissions (1.01 kg/USD) was more than twice the average global level (0.42 kg/USD), more than three times those of the United States (0.3 kg/USD) and five times those of Japan and EU countries. This means that China must continue to perform deep economic restructuring to transform quantitative into qualitative changes.

4.3 Emission Density Pressure

China is faced with pressure from energy densities. A study conducted by the China Academy of Engineering[25] found that eastern China's per-unit-area carbon emissions are 10 times the global average level. Eastern China's per-unit-area vehicle ownership is far higher than that of the United States. Additionally, eastern China's per-unit-area consumption of oil and natural gas is also three times the average global level. China's economic structure is overly skewed toward its eastern region, which is not a wise approach. In 2015, China's coal consumption accounted for 58% of its total energy consumption.

4.4 Emission Peaking

China has proposed strategic goals of reaching its peak carbon emissions and reducing per-unit-GDP CO_2 emissions by 60–65% relative to 2005 levels—by approximately 2030. The international community has high hopes for China. Some countries have asked if China would reach its peak carbon emissions ahead of time. If China meets these countries' expectations, how could it solve the energy supply problem for economic development? This question warrants consideration.

5 China's Choices

China aims to achieve basic modernization by 2035 and full modernization by 2050. Facing these two time points, China needs to focus on important areas.

(1) Fundamental scientific research

Responding to climate change is a scientific concept. Turning scientific concepts into decisions requires medium. Medium research investigates risk management, which requires scientists to clearly clarify the economic and social impacts of climate change. In other words, scientists need to clarify risk governance; otherwise, responding to climate change cannot be turned into decisions. Clarification of risk governance will lead to resolute actions.

(2) International geopolitics

New international rules require brand-new rights to speak, ownership, and plan design and need to be uniformly coordinated from a long period, large-scale perspective. In this new transition period, China needs to take the initiative, actively participate, play a leadership role in building platforms with a scientific discourse system, and train and cultivate a talent team.

(3) Climate and environmental economics

Climate change is a comprehensive topic. On the one hand, focusing on climate and environmental economics, including environmental costs, rights and desires, and national security, is necessary and all of which require an adequate scientific basis and support. On the other hand, when responding to climate change, focusing on interdisciplinary studies, including natural and social sciences, humanities, and geopolitics, is also necessary. According to the IPCC reports, relatively few single-disciplinary studies exist, and the research has changed relatively significantly in terms of depth, breadth, and view. Currently, interdisciplinary, all-round, and full-view research is an important area that provides scientific support for responding to climate change.

(4) New energy technologies and industrialization

With renewable energy technology viewed as the "high ground" for future market competition, various developed countries around the world have adopted different incentive measures. Strengthening the research on new energy technologies and their industrial applications (e.g., electric vehicles, smart grids, green buildings, intelligent transportation, and CCS) is an important direction. China needs to use its advantages and rapidly popularize mature technologies. To date, renewable energy, resource recycling, and geothermal energy technologies have been accumulated and applied.

(5) Several issues that urgently require in-depth investigation

Based on the international situation, scientific circles need to study the following new issues. (1) New carbon emission accounting method. (2) Sharing responsibilities between the producer and the consumer. (3) Emission standards for products. (4) Constraint mechanisms and mediation.

6 Conclusion

The UN is about to convene a new round of summits of heads of states and governments. China played a prominent leadership role in the reaching, signing, and taking effect of the *Paris Agreement* and has become a major contributor and a leader in facilitating the reform of the global climate governance system. The government report from China proposed that China should "actively participate in reforming and building a global governance system and continually contribute its wisdom and strength." China should completely meet its emissions

reduction commitments and forms a domestic "anti-driving" mechanism to facilitate economic restructuring and high-quality development. Additionally, China should also deliver positive signals to the international community and maintain the favorable external environment created by the *Paris Agreement*. Currently, the world is undergoing interwoven global and multipolar development that presents an opportunity for China to demonstrate a successful example of practicing international relations based on win-win cooperation on the world stage. Thus, we appeal to Chinese geographers to conduct in-depth research and make contributions to the field of climate change negotiations.

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