

Comparative Analysis of Domestic Climate Policies Between China and the United States

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Abstract. Climate change is one of the most complex issues in the current human society and almost all countries in the world are facing various degrees of climate challenges. Each country is implementing climate policies according to its own special national conditions, but there are also similarities in the ways different countries deal with climate change. Therefore, the research theme of this article is the comparison of domestic climate policies between China and the United States (US), which are the two major “contributors” to global climate change. Whether these two countries can effectively manage the environmental crisis is the key to the progress of global climate mitigation. Through listing and comparing the domestic climate policies of two countries, this article finds that China and the US have something in common in the areas and limitations of their climate policies, but the processes of policy implementations of the two countries are different from each other.

Keywords: climate change, global warming, environmental politics, domestic policies.

1. Introduction

Climate change is one of the greatest challenges faced by the international community in the 21st century. According to the definition of the United Nations (UN), climate change refers to the significant and long-term changes in temperatures and weather patterns [1]. Although these shifts may be natural such as changes in the solar cycle, human activities have been the major cause of climate change since the rise of the Industrial Revolution in the 19th century, mainly due to the burning of fossil fuels such as oil and coal [1]. This burning leads to the emissions of greenhouse gas such as carbon dioxide and methane, which could absorb heat from the sun and thus raise the temperatures [1]. The global average temperature has increased by 1.1°C compared with that of the 19th century [1]. Many experts and scientists believe that the temperature rise must be controlled to 1.5°C to maintain a safe and livable planet for humans, but they also predict that the global average temperature will rise by 3.2°C by the end of the 21st century [1].

Global warming caused by greenhouse gas emissions is the reason why climate change happens. There are many driving forces behind greenhouse gas emissions and global warming. The first one is industrialization, which is the main source of fossil fuel burning and includes 2 main aspects: the operation of industries and power plants (this will burn the fossil fuels such as coal and gas and hence produces many different pollutants), oil drilling (this process is to collect petroleum oil hydrocarbons and then releases gases) [2]. The second driving force is transport and vehicles. Many kinds of traditional transportation like cars, boats, trains and airplanes rely on the burning of fossil fuels to run, this will definitely cause emissions. The third one is consumerism and waste. With the improvement of people’s consumption level, more products are produced, and people are creating more waste. But many items are not sustainable and recyclable, which will end up in landfills for garbage and it is also a major source of emissions. The fourth one is farming and deforestation. Trees and forests can turn greenhouse gases into oxygen [3]. But farming and agriculture require the clearance of green space and forests, which could hence also worsen the situation of increasing emissions.

Many people think that climate change only means global warming. But warmer temperature is only a part and the beginning of the story of climate change. Because the Earth is a connected system, changes in one area could lead to changes in many other areas. There are many different consequences of global warming. Firstly, more extreme weather will occur because global warming is changing the weather patterns. Extreme weathers have 6 main types: drought, extreme precipitation, heat waves, hurricanes, tornadoes and floods [3]. Secondly, ice melting is also a major consequence of global

warming. Glaciers and sea ice melting will then lead to the sea level rise, which is the third consequence of global warming. In 2020, the global average sea level was 3.6 inches more than that in 1993, this is the highest record since the use of satellites [4]. Fourthly, global warming will also cause the risk of extinction for plants and animals. Warmer temperature means the changes in the living environment of species and it is hence a threat to their living environment. About 30% of all animal and plant species on the planet could face extinction by 2070 [5].

Therefore, climate change is a complicated and integrated issue that requires a comprehensive solution for every individual country. This article will focus on two countries: China and the US (the top two largest emitters of greenhouse gases in the world) [6]. It will describe and compare the current domestic climate policies of these two countries. Through analyzing the similarities and differences between the Chinese and American climate policies, hopefully, this article can provide some references for governments of the two countries on how to better address the issue of climate change.

2. China's Domestic Climate Policies

As the most populous country in the world, China has suffered from an environmental crisis for a long time, which is mainly caused by the increased burning of fossil fuels as a result of its rapid industrialization since the 21st century. China has continuously been the world's largest emitter of greenhouse gas for many years. Its annual emissions are more than twice that of the US (the second largest emitter) and about 1/4 of the world's total [6]. China is suffering from many different types of serious challenges brought about by climate change such as air pollution, droughts and water insecurity. Since 2013, the Chinese government has regarded mitigating and solving environmental crisis as one of the top concerns and agendas. It has taken many domestic measures to combat climate change. Below is a summary of its key climate policies.

2.1 Goals

In 2021, China submitted its updated version of Intended Nationally Determined Contribution (INDC) to the United Nations Framework Convention on Climate Change (UNFCCC), including 6 specific goals about climate change: striving to achieve carbon neutrality by 2060; reaching the peak of carbon dioxide emissions by 2030; reducing carbon dioxide emissions per unit of GDP by over 65% from the level of 2005 before 2030; increasing the account of non-fossil energy in primary energy consumption to 25% by 2030; rising the forest stock by 6 billion cubic meters from 2005 to 2030; and boosting the installed capacity of wind and solar power generators to 1.2 billion kilowatts before 2030 [7].

2.2 Cutting emissions

Reducing emissions is the top priority of every country's climate policy. Chinese government strives to mitigate this issue in 3 main ways.

The first way is to reduce coal consumption. Coal plays an important role in China's economy and it is used as raw material by many factories such as iron, steel and chemicals. The coal consumption of China was more than half of the world's consumption in 2018 [8]. The Chinese government has formulated many policies to reduce China's carbon consumption. For example, in 2017, the Chinese government vigorously promoted the conversion of coal heating to natural gas in many northern cities and cut the capacity of many coal power plants [8].

The second way is operating an emission trading program. At present, 8 cities and provinces in China are running pilot programs, which cover more than 250 million people [9]. The cumulative volume of these programs reached over 335 million tons of carbon dioxide by July 2019, which is valued at about RMB 7.3 billion (about \$1 billion). The price was RMB 72 to 88 (\$10.5 to 12.5) per ton [9]. The Chinese government is optimistic about the expansion of the emission trading program.

The third way is deploying electric vehicles with zero emissions. China's deployment of electric vehicles leads the world with 45% global total stock [10]. There are three major policies of the Chinese government regarding electric vehicles: firstly, it mandates that every Chinese automobile

manufacturer or importer must annually manufacture or import at least 10% of electric vehicles; secondly, it provides subsidies to electric vehicles enterprises; thirdly, it exempts sales and consumption taxes to electric vehicles, which could help consumers save more than RMB 10 thousand (over \$1000) [11]. It is worth noting that provincial and local governments are very active and play an important role in promoting the development of electric vehicles in China. For instance, many of them provide electric vehicles with exclusive license plates, which are cheaper and faster than normal vehicles [11].

2.3 Deploying clean power

Improving the role of clean and renewable energy to replace fossil energy is also one important focus of Chinese climate policy. This includes 3 key different aspects.

The first aspect is hydropower. The hydropower deployment of China always ranks 1st in the world, it accounts for more than 25% of global total deployment [12]. At the end of 2018, China had hydropower of about 350 gigawatts, which was more than 3 times that of any other country in the world [12]. The Chinese government attaches great importance to hydropower development. It sets the goal of increasing hydropower capacity to 470 gigawatts by 2025 in its 13th Five-year Plan [13]. In addition, the Chinese government also emphasizes the construction of pumped hydroelectric power stations and the import of more related cutting-edge equipment and technology [13].

The second aspect is wind power. The wind power deployment of China (185 gigawatts) also leads the world, and it accounts for about 1/3 of global capacity [14]. Wind power occupied about 10% of its installed power capacity in 2018 [14]. At the end of 2020, China successfully achieved its target of 6% of total electricity generated by wind power in the 13th Five-year Plan, it arrived 6.1% [15]. Moreover, starting from 2021, the Chinese government has planned to completely replace the feed-in tariff with renewable energy consumption quotas [16].

The third aspect is solar power. The solar power deployment of China (175 gigawatts) also always ranks first in the world with more than 1/3 of global total deployment [17]. About 45% of globally new-added solar power capacity in 2018 was from China [17]. The Chinese government has invested heavily in the development of solar power. For example, the China Development Bank provided capital assistance to many solar power enterprises and manufacturers, this policy played an important role in the development of China's solar power after the Global Financial Crisis in 2008 [18].

3. America's Domestic Climate Policies

The US is also a country deeply affected by climate change. Its average temperature has increased by 1.4°C since the 1970s [19]. In the last decade, the US experienced the hottest ten years (from 2010 to 2019) in its national history [20]. As mentioned before, the US is the second largest emitter of greenhouse gas (only behind China) [6]. But it has the highest emissions per person (15 tonnes) in the world [21]. Climate change also has a significant impact on the American environment such as extreme weather and sea level rise. There was a serious politicization of climate change in the US between 2017 and 2020. But since 2021, the American government has made solving the climate crisis one of the most important national agendas.

3.1 Goals

The American government established the National Climate Task Force in 2021, which includes over 25 Cabinet-level leaders and sets up the following goals: reducing greenhouse gas emissions by over 50% from the level of 2005 before 2030; realizing 100% electricity without carbon pollution by 2035; and achieving zero-emission economy before 2050 [22].

3.2 Cutting emissions

The American government has proposed various policies to cut greenhouse emissions.

It firstly boosted the development of electric vehicles. the American government set the goal to make electric vehicle sales share achieve 50% in 2030 and it also issued the EV Charging Action Plan in 2021, which is valued at \$7.5 billion to create a convenient charging network for all-electric vehicles [22]. Since 2021, the number of electric vehicles in the US has reached 2 million, and the installation rate of the public charger has increased by nearly 50% [22].

Secondly, the American government launched the Methane Emissions Reduction Actions Plan, which is to reduce methane emissions in multiple areas such as manufacturing, agriculture and the gas and oil sector [22]. This action could also protect public health and promote the innovation of emission-reduction technology [22].

Thirdly, it expanded cooperation with factories to reduce industrial emissions. The US Department of Energy's "Better Building, Better Plants" program has partnered with more than 3500 factories, which represents about 15% of American manufacturing [22]. The American government also announced some pilot programs to further cut carbon emissions [22].

3.3 Deploying clean power

Boosting the development and deployment of clean power is also an important priority of American climate policy. The US has 3 main measures for this.

The first measure is developing the US offshore wind industry, which divided new wind power zones in the Pacific and Atlantic and held a record-breaking \$4.3 billion lease sale in New York Bight [22]. This measure is in line with America's goal of achieving 30 gigawatts of offshore wind power deployment by 2030 [22].

The second measure is issuing fast-tracked projects to deploy unprecedented scale of renewable power such as solar power on public land and to help local governments promote the solar project's installations [22].

The third measure is promoting the development of clean domestic manufacturing. This includes investing \$9.5 billion for the use of clean hydrogen; providing policy support and reward for enterprises and manufacturers producing clean steel and aluminum; and setting up a Buy Clean Task Force to purchase low-carbon building materials [22]. The US also announced the first comprehensive plan of the American government to establish an industrial base in the energy sector [22].

In addition to the policies above, the US is also committed to deepening cooperation between the federal government and state governments in the field of climate change. For example, it set up a federal-state task force with Western governors to mitigate the consequences caused by climate change such as drought [22].

4. Comparison of Chinese and American Climate Policies

There are both similarities and differences between the climate policy of the two countries.

4.1 Similarities

The Chinese government and the American government are both highly concerned about the issue of climate change, and they both have set specific and clear goals for addressing the climate problem. In addition, the climate policies of both countries have particularly focused on cutting emissions and deploying clean energy, and both governments have invested a lot of money to support these two agendas. Therefore, both countries have made great progress in reducing greenhouse gas emissions and promoting the development of clean power, and both the Chinese government and the American government have taken significant steps to tackle climate change or global warming. However, the climate policies of both countries focus too much on the reason why climate change happens (the increasing greenhouse gas emissions) and how to mitigate it. It is important but not enough to address the climate issue only from its root cause. As mentioned in the introduction section, climate change is a complex issue, there are many different consequences as a result of it such as extreme weather

and species extinction. Both China and the US have not taken enough measures to solve these challenges.

One representative example is species extinction. Both countries are facing a risk of extinction for wildlife. For China, due to habitat destruction mainly caused by climate change, there are 65 extremely endangered species [23]. Of the 25 extant primate species in China, 80% of them are seriously threatened, and more than 15 species are less than 3000 in size [24]. Although the Chinese government has taken some positive actions, such as increasing the forest cover and strengthening the crackdown on wildlife consumption and trade, the situation is still not optimistic [23]. The US is also facing a great challenge to prevent species extinction. In 2021, there were 22 types of animals in the US went extinct, which is a tragedy [25]. The biggest step of the American government to protect biodiversity is enacting Endangered Species Act in 1973 [26]. Although this act has made about 40 species fully recover from disappearing from the planet, it still cannot stop the continuous extinction of species [26]. Therefore, it is necessary for the two countries to take further measures to protect wildlife.

There are two main suggestions for both the Chinese government and the American government to protect biodiversity: firstly, the law is the most effective tool for the country to achieve its goal. Both countries should improve the relevant laws and increase the punishment for illegal hunting/fishing and other related behaviours. Secondly, protecting and rebuilding the habitat of species is also a top priority in preventing species extinction. For endangered species, establishing nature reserves or national parks system is the best way for them to have a safe and livable habitat. The governments of the two countries should hence increase investment and construction of nature reserves to promote the agenda of national wildlife protection.

4.2 Differences

There are differences in the processes of the implementation of climate policy between the two countries.

For China, the central government has firstly formulated the climate policy, and the provincial and local governments then strictly follow its instructions to implement it. This can be seen from the example of the deployment of electric vehicles. After the central government has decided to develop electric vehicles, provincial and local governments respond actively and formulate specific measures to implement it according to their own conditions. As mentioned before, many of them provide electric vehicles with exclusive licenses plates [11]. China's process of the implementation of climate policies) has both advantages and disadvantages in solving the climate crisis. For advantages, since the Chinese Communist Party is the only dominant party in China and the central government has absolute authority in Chinese politics, this political stability can enable China to have a strong long-term planning ability in climate policy-making (which is very important in combating climate change), and also make the implementation of climate policy more efficient because the central and provincial governments are united and they will work together. However, the absolute authority of the central government also has limitations. When there are mistakes or something inappropriate in the climate policies formulated by the central government, the provincial governments and local governments have limited power to change and can only follow them. For example, some experts believe that some climate goals set by the Chinese government are not ambitious enough. China hopes to reach the peak of carbon dioxide emissions by 2030, but it should achieve this goal by 2025 at the latest based on the Paris Climate Agreement [27]. In this case, no provincial governments have the power to modify and adjust the national climate goals except the central government.

For the US, state governments have more autonomy in implementing climate policies and they do not need to abide by the decision of the federal government. This can be seen from the example of the cooperation between the federal government and state governments in the field of droughts. The word "cooperation" could show the autonomy of state governments in the US. This (America's process of the implementation of climate policies) also has both advantages and disadvantages when it comes to addressing climate change. This can be reflected in the case of the establishment of the

US Climate Alliance. In 2017, the American government intended to withdraw from the Paris Climate Agreement. Then, to oppose this decision and support the Paris Climate Agreement, the governors of New York, Washington and California decided to establish the Climate Alliance, which is currently expanded and made up of 25 individual states and represents more than half (55%) of the US national population, about \$12 trillion of the US economy and 40% of the US greenhouse gas emissions [28]. In 2021, the American government decided to rejoin the Paris Climate Agreement and deepen the cooperation between the federal government and state governments in the field of climate change, which is praised by the Climate Alliance. On one hand, this case shows that the greater autonomy of state governments of the US allows them to choose not to follow the decisions of the federal government (which they believe are wrong) and to formulate more practical climate policies based on the environmental conditions of their own jurisdictions. However, on the other hand, this autonomy may lead to tensions and conflicts between the federal government and state governments, which is not conducive to the steady progress and achievement of the US national climate goals.

Therefore, the differences in the processes of the implementation of climate policy between China and the US reflect that the political systems of the two countries are different.

5. Conclusion

Overall, through analyzing and comparing how the Chinese government and American government are combating climate change, this article has found that there are both similarities and differences in the domestic climate policies of the two countries. For similarities, both countries have made great progress and achievements in two areas of climate change - cutting greenhouse gases emission and developing clean energy, but they both focus too much on why climate change happens and pay not enough attention to the consequences of climate change. This article has taken species extinction as an example to demonstrate this point, and it has also provided 2 suggestions for two countries to protect biodiversity: improving relevant laws and establishing nature reserves. For differences, the processes of implementing climate policies in the two countries are completely different. In China, although provincial governments have specific policy-making power, they must strictly abide by the climate policies and requirements formulated by the central government; but in America, state governments have the power to make their own climate policies and they do not have to follow the ideas of the federal government. Each of these processes has advantages and disadvantages. Therefore, all countries should give full play to the strengths of their own political systems and work together to combat climate change, which is a common challenge faced by all human beings in the world.

Finally, the research of this article has a limitation: it has only analyzed and compared the domestic climate policies of China and the US, and it does not pay attention to their international climate policies. But climate change is a global issue and needs joint effort from all countries. Therefore, further research could focus more on the importance of international cooperation and the role of international organizations such as the UN in addressing climate change.

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