

CLIMATE POLICY ANALYSIS

Country Profile: China

Assessing progress toward the Paris Agreement under China's Nationally Determined Contributions

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Introduction

Climate change is one of the most pressing issues facing our planet today. Rising temperatures, changing weather patterns, and increasing natural disasters devastate ecosystems and communities worldwide. With its rapid economic growth and as one of the largest emitters of Green House Gas (GHG), China plays a critical role in addressing this global crisis. Through the analysis of China's Nationally Determined Contributions (NDCs), this country profile report will examine its progress toward the Paris Agreement. This country profile seeks to provide a comprehensive analysis of China's approach to the climate crisis through five primary sections. Firstly, it will introduce China's official philosophy towards the climate crisis that has inspired the development of initial and updated NDCs. The subsequent section will examine China's progress in achieving its NDC goals and how it measures milestones compared to the Climate Action Tracker. Thirdly, it will critically evaluate the challenges and insufficiencies facing China's current NDCs, including factors that have led to unaccomplished goals. Lastly, sections four and five will propose strategies for accelerating action to achieve the Paris Agreement goals, which include the necessities for a just transition and adopting more ambitious policies to address housing affordability and equity to tackle the climate emergency.

China was chosen for this country profile because it is one of the world's largest emitters and fastest growing economies and is also where my traditional ancestral home resides. Despite immediate efforts by the Communist Party of China (CPC), social and financial inequity is rapidly rising with the influence of rapid industrialization. China's coastal cities, which are home to a significant portion of the population and contribute significantly to the economy, are under threat from the impacts of climate change, such as flooding, erosion, and saltwater intrusion. Coastal China already experiences frequent coastal flooding, storm surges, and erosion. At the same time, western in-land China faces more extraordinary climate anomalies impacting the most vulnerable regarding the ethnic and financially marginalized. Ultimately, curbing China's greenhouse gas output will do more than almost anything else at this point to decide the fate of the planet.

China's Nationally Determined Contributions

China's Philosophy of Climate Change

Like many other countries most vulnerable to climate change, China has been subject to centuries of colonial exploitation, which set a precedent for China's philosophy on development, neo-liberalism and climate action. The Chinese Dream, which seeks to rapidly develop the

country technologically and economically to reclaim its position as the Middle Kingdom after centuries of subjugation, encapsulates this vision. China's updated NDCs document, Government of China (2021) China's Achievements, New Goals and New Measures for Nationally Determined Contributions, outlines a proactive response to climate change that elevates high levels of economic development while establishing a sound economic structure for green, low-carbon, and circular development, a clean, low-carbon, safe, and efficient energy system, and green and low-carbon ways of life.

As a result, China has embraced market-based mechanisms such as carbon trading to reduce emissions and promote sustainable development. China has launched the world's most extensive carbon trading system, which covers nearly 3,000 power plants and aims to reduce emissions by up to 1.5 billion tons by 2025 (Government of China, 2021). The market and private property serve the state's developmental agenda. This form of marketization has reintegrated China into neoliberal globalization without pursuing a wholesale adaptation of neoliberal economic policies to combat climate change.

China's Initial NDC Goals

In June 2015, the Chinese government submitted the Enhanced Actions on Climate Change. China's Intended Nationally Determined Contributions are summarized as follows:

1. Achieve the peaking of CO₂ emissions around 2030 and make the best efforts to peak early.
2. Lower CO₂ emissions per unit of GDP by 60% to 65% from the 2005 level.
3. Increase the share of non-fossil fuels in primary energy consumption to around 20%.
4. Increase the forest stock volume by around 4.5 billion cubic meters on the 2005 level.
5. Take adaptation actions to effectively enhance mechanisms and capacities to defend against climate change risks.

China's Updated NDC Goals

On October 28, 2021, three days before the 26th UN Climate Change Conference of Parties (COP26), China submitted its updated Nationally Determined Contributions to the United Nations Framework Convention on Climate Change (UNFCCC). The updated NDCs are:

1. China aims to have a CO₂ emissions peak before 2030 and achieve carbon neutrality before 2060.
2. China aims to lower CO₂ emissions per unit of GDP by over 65% from the 2005 level.
3. China aims to increase the share of non-fossil fuels in primary energy consumption to around 25%.

4. China aims to increase forest stock volume by 6 billion cubic meters from 2005.
5. China aims to bring its total installed wind and solar power capacity to over 1.2 billion kilowatts by 2030.

Progress and Achievements

Renewable Energy

Regarding lowering GHG emissions per GDP, China has expressed significant progress in controlling GHG emissions with low-carbon development models and building sustainable energy systems. As a result, by 2019, national non-fossil fuel energy consumption sharply rose to 15.3% from 2005's 7.9%, and at the same time, coal consumption fell from 72.4% to 57.7% (China's National Energy Administration / NEA, 2019). According to preliminary calculations, China's carbon intensity (CO₂ emissions per unit of GDP) in 2019 decreased by about 48.1% from 2005, reaching 51.9% of the 2005 level. This exceeds the 2020 goal of reducing CO₂ emissions per unit of GDP by 40–45% from the 2005 level, representing a cumulative reduction of about 5.7 billion tons in CO₂ emissions (Carbon Brief, 2021). In 2022, China issued new renewable targets, aiming to generate 3,300 TWh of electricity from renewable sources by 2025, which is approximately 35% more than it did in 2020.

Equitable Energy Development

Likewise, poverty alleviation and peripheral development are primary highlights in China's NDC achievement evaluation. For example, photovoltaic poverty alleviation projects implemented in areas with abundant renewable energy resources but relatively backward economies have not only boosted the use of renewable energy but also improved residents' living standards with wind, solar and hydropower generation capacities to sustain equitable distributions of energy. Sichuan province was used as a successful pilot for implementing appropriate renewable energy measures in underdeveloped and rural regions in China. As of June 2020, 18 concentrated photovoltaic poverty alleviation projects with a combined installed capacity of 450 MW have been constructed, benefiting more than 20,000 poor households in 17 counties (ERI and NDRC, 2021). Additionally, 70 grid-connected village-level power stations with an installed capacity of 31 MW have been built for photovoltaic poverty alleviation, providing benefits to 3,553 poor households in 20 counties (ERI and NDRC, 2021). The projects have generated a cumulative income of 44.69 million yuan from power generation and created 6,187 public welfare jobs (Government of China, 2021).

Transitioning out of Coal

Perhaps the most pressing target for tackling climate change is coal consumption. In 2020–2021, China shifted its stance on coal consumption, as evidenced by President Xi Jinping's announcement that China would strictly control coal consumption until 2025 and gradually phase it out thereafter. For example, as of 2019, the average use of standard coal consumption for power generation by thermal power plants has dropped to 306.4 g/kWh, a decline of 63.6 g/kWh compared with 2005 (Climate Action Tracker, 2022). In addition, China has pledged to discontinue financing for the construction of coal plants overseas, with 2021 marking the first year since 2000 that China's two central policy banks did not provide new energy finance commitments to international governments (Climate Action Tracker, 2022). This pledge could cancel 43 GW of new coal projects across Asia, including no new coal projects in countries such as Bangladesh and Sri Lanka. However, despite these efforts, China produced its highest-ever annual output in coal production in 2021.

Challenges

China faces immense challenges in achieving its NDCs due to its status as a developing country with a large population. The country is rich in coal but poor in oil or gas, and it is in a critical period of transforming its growth model, optimizing its economic structure, and shifting growth drivers. Despite the continuation of industrialization and urbanization, it is unlikely that the coal-dominated energy mix will change fundamentally in the short term, causing energy demand to keep rising. These challenges require significant efforts to address economic development, people's livelihood improvement, environmental governance, and climate change.

Per existing policies, attaining the IPCC 1.5°C or even 2°C maximum-warming goals appears challenging. Several models indicate that achieving these objectives necessitates reducing coal's share in China's electricity generation to approximately 0% by 2050, as stated by Climate Action Tracker in 2022. China's coal usage surpasses the power sector, with power generation accounting for 58.8% of the total coal consumption in 2019. The remaining coal consumption was attributed to industrial uses such as coal burners, iron and steel production (16.4%), building materials (9.4%), chemicals (7.4%), and residential and other uses (8%) (He et al., 2020).

Additionally, the swift transition to renewable energy sources poses economic and social challenges, including impacts on employment, local tax revenues, and existing coal-asset owners. For example, coal-related industries contributed 29% of GDP and 46% of tax revenues in 2018 in Shanxi, one of China's most extensive coal producers (He et al., 2020). Since coal is one of the most significant sources of employment, GDP, and tax revenues in coal-producing

regions, there is persistent inertia to transition away from coal without additional supportive policies.

Suggestions and Recommendations

Suggestion 1: A Just Transition — Equitable Distribution in the National Periphery and Green-Skill Development

China suffers a gap of social and income inequity between the Han coastal central provinces and the national periphery inhabited by its ethnic minorities, revealing that its low-carbon transition will have distributional implications. Marginalized low-income households and communities in the national periphery will be affected through several channels. Rising energy prices—either because of explicit carbon pricing or regulations—will affect household consumption, with low-income communities often less able to adjust and substitute into lower-carbon alternatives. Households will also be affected by changes in the labour market, with some experiencing job losses and transitions and positive or negative impacts on their wages and other sources of income. The specific policies adopted also matter. Suppose carbon revenues are recycled to compensate households through transfers; this could help alleviate some adverse effects if a social safety net is expanded to protect vulnerable households. For example, the World Bank (2015) suggests developing a comprehensive and coordinated labour market policy package, including:

1. Compensation and income support measures for laid-off workers and their families.
2. Active labour market programs such as public employment services, training, reskilling, and entrepreneurship to help the re-employment of laid-off workers.

Moreover, approximations suggest that 10 to 15 percent of China's labour force is employed in industries that generate significant carbon emissions. Most of these high-carbon jobs are in the mining, energy, manufacturing, and transportation sectors, with a considerable portion of informal employment. Many of these jobs require relatively low levels of skills. Over the past five years, employment in these industries has declined, while low-carbon industries have seen a rise in employment, which has more than offset the losses. As of 2015, the number of green jobs in China was estimated to be 54.42 million (Carbon Brief, 2021). Green jobs typically require higher levels of human capital, which has important implications for education and skills development. This is why such opportunities are predominantly in the wealthier Han-majority coastal areas, with Shandong, Jiangsu, and Guangdong having the highest number of green jobs among mainland provinces.

Consequently, it is imperative to devise a green skills strategy that integrates green skills into the training and education for green jobs to enhance equitable opportunities for workers

(mostly low-income minorities) in the periphery. To meet the growing demand for green skills in green jobs, the government should reassess its skills development policies and collaborate with schools, training institutions, employers, and workers to incorporate green skills into relevant programs. This transformation should involve the creation of modular and competency-based curricula materials in training and reskilling programs. Thus, such strategies promote lifelong learning for the workforce to acquire the skills necessary for green jobs through on-the-job training, in-service training, and apprenticeships.

Suggestion 2: Secure, Safe & Affordable Housing in a Climate Emergency

China's recurrent cycles of internal migration, with a predominant trend from rural to urban areas, indicate the country's rapid urbanization and transition from a planned to a market economy. Limited access to urban housing, coupled with the migrant population's temporary status, contributes to their poor living conditions. The intertwined affordable housing and climate crises exacerbate the situation. The dearth of affordable housing in many cities forces individuals to reside in unregistered dwellings susceptible to poor living conditions and climate-related disasters.

The increasing frequency and intensity of extreme weather events caused by climate change worsen the housing crisis by diminishing the supply of affordable housing and escalating housing and related costs. These dual crises disproportionately affect individuals with low incomes and minorities, who are more vulnerable to the effects of climate change and are burdened by higher costs. These disparities stem partly from past discriminatory policies that have resulted in unequal neighbourhoods, compounded by present-day exclusionary zoning and land-use policies that restrict development in proximity to job centers and other desirable amenities (Climate Action Tracker, 2021). Additionally, inequitable disaster recovery allocations favour homeowners over renters and Han people over ethnic minorities from the periphery. As observed, climate change interacts with differential exposure to risk, preparedness, coping, and recovery capabilities from climate change impacts. Low-income residents and minorities are often more severely affected by climate change and by adaptation and mitigation policies (Green, 2014).

Solving these crises entails investing in new, environmentally sustainable public housing and community-level mitigation efforts. Addressing infrastructure and service inadequacies in low-income communities and neighbourhoods and building up institutions and governance options, including financing, are the primary steps. The construction of public housing would not only expand the supply of affordable housing but could also considerably reduce carbon emissions while enhancing residents' quality of life (Reckien et al., 2017).

Complementing these investments with support for community-level mitigation measures, such as levees and open spaces that function as fuel breaks, can help protect entire communities against mounting threats. Granting marginalized groups full access to decision-making processes will make them active participants in climate change governance. For mitigation, spatial planners should be conscious of and endeavour to reduce possible negative repercussions of compact-city spatial planning models on low-income neighbourhoods and ethnic communities, for example, by using social policy to cap accommodation prices and rents for households in need. Related to public transport, it is crucial to reduce out-of-pocket expenses, offer unlimited-use passes for public transportation, and prioritize women's perspectives in public transport schemes.

Conclusion

To conclude, the devastating effects of climate change on ecosystems and communities worldwide have made it one of the most urgent issues of our time. As one of the largest emitters of greenhouse gases, China's proactive response to this crisis through its updated NDCs is crucial. Despite challenges such as the coal-dominated energy mix and rising energy demand, efforts must be made to address economic development, environmental governance, and climate change. Strategies proposed in sections four and five of this country profile, including a just transition and policies to address housing affordability and equity, can accelerate action towards achieving the Paris Agreement goals. Additionally, investing in new environmentally sustainable public housing and community-level mitigation efforts, addressing infrastructure and service inadequacies, and integrating green skills into training and education for green jobs are crucial steps towards a more equitable and sustainable future.

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