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Techno-nationalism and China's transition toward carbon neutrality

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Introduction

In September 2020, China updated its decarbonization plan, announcing that it aims to achieve peak CO₂ emissions by 2030 and strive for carbon neutrality by 2060 (Wu et al., 2022). Colloquially known as the "dual carbon" goals, the plan has drawn considerable attention both domestically and abroad. As this announcement was made at a time when the Chinese economy was seriously affected by the COVID-19 pandemic, the plan was seen not only as a reiteration of the commitments the Chinese government made during the 2015 Paris Climate Summit but also as an economic blueprint based on the sustainable development momentum initiated by ecological civilization, China's policy and ideological framework for balancing economic growth and environmental protection (Chen and Zhao, 2022).

Although China's transition to carbon neutrality has been examined from the perspectives of economy, energy, environment, and technology, it has rarely been explored from the perspective of public communication. In this commentary, I reflect on the broader discourses surrounding China's environmental and technological policies, thereby underscoring how environmental communication is intertwined with national identity and technological aspirations. This offers a fresh perspective on how countries articulate their environmental commitments in a competitive global landscape.

Specifically, the commentary explicates how techno-nationalism plays a pivotal role in shaping public communications concerning the "dual carbon" goals. China's aggressive pursuit of, and enthusiasm for, renewable energy development are infused with techno-nationalist imaginaries that regard renewable sectors as a critical front enabling China to gain strategic advantages against the United States. The phase-out of fossil fuels in China may accelerate in the years ahead and catch international observers by surprise. In light of this, the commentary problematizes the prevailing "bridge fuel" narratives (Chen, 2020) promoted by North America's liquefied natural gas (LNG) industry, which justify further expansion of fracking activities by emphasizing the future growth potential of China's LNG imports.

Techno-nationalism in China: an overview

In the late 1980's, Reich (1987) introduced the term "techno-nationalism" to underscore the importance of safeguarding future technological advancements in the United States from foreign exploitation. Since then, relevant scholarly discussions have developed the term into a multidimensional and flexible concept that

recognizes the diverse approaches taken by states when setting up and implementing technology policies. Manifestations of techno-nationalism, despite their diversity, share three major points of agreement (Kennedy, 2013; Na and Pun, 2023). First, technological innovation capacity is considered as a determinant factor in the competitive struggle between nation-states. Second, investing more in research and development and developing high-tech industries are seen as effective solutions for economic challenges, such as slow growth and unemployment. Third, technological innovation is becoming more closely associated with military autonomy, national defense, and self-sufficiency.

Since the beginning of the “reform and opening up” era, China’s science and technology policies have encouraged both the acquisition and assimilation of Western technologies and indigenous technological innovation, suggesting a pragmatic approach that combines techno-nationalism with technoglobalism (Kennedy, 2013). This approach views technologies as “ideologically neutral” instruments that facilitate China’s socio-economic modernization and integration into global capitalism. This said, China has witnessed a significant increase in public sentiments related to protectionist techno-nationalism in recent years, as it has engaged in an escalating tech war with the United States. Increasingly, the social meanings of “technological innovation” in China have been defined and promoted around the rhetoric of national interest and national security, as evidenced by discourses concerning the development of Chinese information and communications technology (ICT) sector (Na and Pun, 2023).

The National Medium- and Long-Term Plan for Science and Technology Development (MLP), introduced by the Chinese government in 2006 and later updated in 2021, is the primary policy framework currently guiding China’s technological progress. Both versions of MLP (2006–20 and 2021–35) recognize renewable energy as a priority area (Braun Strelcová et al., 2022; Kennedy, 2013). They also have a decidedly nationalistic tone, emphasizing the importance of China improving its indigenous innovation capability in order to compete with other countries for technological strength. This has contributed to China’s strategic preference for combining the power of state and domestic capital when participating in increasingly competitive international renewable energy markets. For example, the rapid growth of solar panel manufacturing and export capacity in China, supported by government-backed subsidies, has ignited a prolonged US/EU-China “solar trade war” since the 2010s (Caprotti, 2015; Hughes and Meckling, 2017).

Compared to existing literature on environmental communication in China, the perspective of techno-nationalism offers new insights by addressing how the country’s decarbonization efforts are deeply rooted in concerns over national identity and security. It encourages a re-assessment of how technological advancements are perceived not only as economic opportunities but also as tools for national empowerment on the global stage. Understanding China’s energy policymaking through this lens can provide a more nuanced view of its motivations and strategies, particularly in contrast to Western narratives that tend to emphasize authoritarianism and propaganda (Chen and Zhao, 2022).

Public communication of the “dual carbon” goals

Much like ecological civilization, public perceptions of the “dual carbon” goals are influenced by relevant public communication found in media coverage, policy documents, and scholarly discussions (Chen and Zhao, 2022). Among “dual carbon” discourses, there is a noteworthy trend: the underplaying of natural gas in China’s energy future compared to renewables. For example, in a feature story by Xinhua, China’s state news agency, the country’s progress toward net-zero was framed as primarily driven by innovation and investment in new energy industries, as well as CO₂ recycling and conversion (Xinhua, 2023). Similarly, in an infographic series titled “China’s progress toward ‘dual carbon’ goals in 3 years,” published by another state-owned Chinese media outlet, *Global Times*, metrics cited to assess progress in decarbonization were: (1) the share of non-fossil fuels in primary energy consumption, (2) forest stock volume, and (3) the total installed capacity of wind and solar power (Global Times, 2023).

The low-profile status of natural gas in domestic media narratives concerning China’s energy transition is intriguing, considering the following factors. First, the share of natural gas in China’s energy mix has steadily grown over the past decade, increasing from 3.3% in 2009 to 9.5% in 2022 (Liu et al., 2023). Today, China’s gas demand growth potential remains substantial, even though its status as a major gas producer. This has been used by the North American LNG industry to back up the expansion of trans-Pacific LNG trade (Chen, 2023). Second, China currently classifies natural gas as a “clean fuel” and deems it crucial in the process of phasing out coal in residential heating and electricity generation. Third, public support for shale gas development in China is substantial, especially when compared to the United States (Zhang et al., 2022). This could be attributed to the Chinese public’s perception of natural gas as a cleaner alternative to coal and oil, as well as their lack of knowledge regarding the environmental impact of fracking. In short, given that natural gas will continue to play a key role in fueling China’s economic growth in the coming decades, its limited presence in domestic discourses celebrating China’s environmental progress is indicative of strategic decisions made by policymakers, scholars, and media outlets.

A major factor underpinning these decisions, in my opinion, is techno-nationalism. Techno-imaginaries constructed based on renewables, in contrast to natural gas, have two notable advantages. From the perspective of energy security, although China has been keen on diversifying its energy imports, further increasing its reliance on natural gas would still leave it vulnerable to future geopolitical risks (Feng, 2024). These risks could be avoided if renewables were the dominant sources to meet China’s future energy demand. Furthermore, China has been the leader of the global renewables race in terms of installed renewable capacity, investment scale, and policy support (Hilton, 2024). Consequently, it increasingly positions renewable technologies as a critical field that would aid in its competition with the United States by establishing itself as the global supplier of goods to an increasingly carbon-constrained world.

Consider, for instance, the stunning growth of China’s electric vehicle (EV) industry, which in 2022 reached a remarkable

6.8 million annual sales, far exceeding the U.S. record of around 800,000 (Yang, 2023). The rapid expansion of China's EV manufacturing capability and market size is framed as part of China's pursuit of the "dual carbon" goals and is made possible by generous policy incentives, such as government subsidies, tax breaks, and procurement contracts. These policy incentives are driven by not only environmental considerations, such as reducing air pollution and dependence on imported oil, but also the potential benefits of revitalizing China's high-end manufacturing industries and gaining a competitive advantage in the global automotive market.

Conclusion

The future of China's energy mix, as presented in the analysis above, is far from certain. The case of China's EV industry demonstrates that the Chinese government has both the determination and the financial capacity to substantively alter the course of what it deems as key strategic sectors in just a few years. As China seeks to build competitive advantages against the United States by accelerating technological innovation in renewables, the share of fossil fuels in China's energy mix may decline more rapidly than current estimates. At a minimum, this poses additional financial risks to the proposed expansion of trans-Pacific LNG trade by Canadian and U.S. LNG stakeholders. Thus, instead of blindly embracing "bridge fuel" narratives that use China's future gas demand to justify North America's shale gas development (Chen, 2020), we need to carefully consider the numerous risks linked to the expansion of LNG infrastructure.

Furthermore, as countries navigate the intricacies of energy transition and climate change, policymakers benefit from comprehending the interplay between techno-nationalism and environmental communication. On the one hand, they may craft more narratives that assert national capabilities and global competitiveness to resonate with their populations while advancing

energy transition goals. On the other hand, in order to cultivate more constructive partnerships, international collaborations on renewable technologies should consider nationalistic sentiments.

Author contributions

SC: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

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