

RESEARCH ARTICLE

Emissions trading in China: New political economy dynamics

Zexiang Wang¹  | Jouni Paavola² ¹School of International Relations, Sun Yat-sen University, Guangdong, China²School of Earth and Environment, University of Leeds, Leeds, UK**Correspondence**

Zexiang Wang, School of International Relations, Sun Yat-sen University, Guangdong, China.

Email: wangzexiang88@gmail.com; mlzw@leeds.ac.uk**Funding information**

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Abstract

China has pledged to peak carbon emissions by 2030 and to become carbon neutral by 2060. Achieving the targets would need great improvement of its emissions trading scheme (ETS) that covers half of the country's emissions. Lessons from the European Union have shown that the ETS is not only a product of the changing circumstances, but its implementation and revisions are also continuously affected by the evolving context. Using a political economy perspective, we examine whether the changing environment is also affecting China's ETS. Our analysis centres on two recent contextual dynamics with relevance to the ETS: (1) the change in the ETS authority in 2018; and (2) the impacts of the deteriorating economic environment on the climate-energy policy complex. We find that China's ETS and its broad climate ambitions are still constrained by the tensions between the long-term socio-economic benefits of low-carbon policies and the short-term economic interests behind the government's policy motives, which led to conflicting interests and priorities among regulatory agencies and local governments. The analysis contributes to the political economy debates on emissions trading and China's environmental governance. It also provides practical insights to the policymakers with an in-depth inquiry into the structural barriers to China's net-zero targets.

KEYWORDS

China, conflicting interests and priorities, economic slowdown, emissions trading scheme, ministerial reform, political economy

1 | INTRODUCTION

China has pledged to peak its greenhouse gas (GHG) emissions before 2030 and to become carbon neutral by 2060. Achieving the targets would require great improvement of its emissions trading scheme (ETS, or interchangeably carbon market) that covers half of the country's emissions. However, China's ETS may be haunted by barriers arising from its unique institutional features of economic prioritisation and authoritarian environmentalism (Gilley, 2012; Han et al., 2012; Lo, 2016), which have become even more pressing due to the ongoing global recession and geopolitical conflicts. The government is used to prioritise economic growth over environmental protection and to

pursue environmental policy goals with coercive and mandatory measures. These features have led to high implementation costs and conflicts between economic and environmental interests.

The ETS offers China a new governance approach that can reduce emissions with lower policy costs, improve governance efficiency and create new opportunities for investment and economic growth (Han et al., 2012; Lo, 2015). However, the assumed benefits are constrained by the political economy context which has changed significantly since the government first revealed the ETS plan in 2011. China has reformed its environmental governance by establishing a new powerful environmental ministry and increasing its control over local environmental officials (Shen & Jiang, 2021). The economy has

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also experienced a painful slowdown due to a combination of factors. Our analysis starts from the political economy perspective that the ETS is essentially political, reflecting the broad relations of political and economic power within which it evolves (Ervine, 2017; Lane & Newell, 2016). Political economy considerations permeate the whole ETS process from the outset as to why it is chosen over other policies, to the consideration of design options and its performance and adaptation (Aldy, 2017; Lane & Newell, 2016; Paterson, 2012). While much research has examined China's ETS, little is known about how China's unique yet dynamic political economy shapes it.

Such examination is important. The experience from the European Union (EU) has demonstrated that the ETS is continuously affected by political-economic dynamics, mirroring the broad relations of political, economic and environmental interests. Hence, we examine how the recent changes in China's political economy affect its ETS, probing the structural barriers to China's future emission reduction efforts. We focus on two recent changes in China's ETS political economy: (1) the change of the ETS authority in 2018; and (2) the ongoing economic slowdown and its implications for the climate-energy policy complex. Drawing from empirical evidence, we argue that China's ETS is still stranded by the government's dilemma of balancing short-term economic interests and long-term socio-environmental imperatives. The government needs to prioritise climate change agenda and build trust in the long-term socio-economic benefits of the ETS. The national targets of achieving carbon peak and carbon neutrality (*tandafeng* and *tanzhonghe*, 碳达峰碳中和) may provide momentum for this, but its efforts could still be overshadowed by the fragmented authority framework and ongoing economic challenges. Our analysis resonates with two strands of earlier research published in *Environmental Policy and Governance*: one on the political economy of emissions trading (Deters, 2019; Skjærseth, 2010; Stevens, 2019; Thomas et al., 2011) and the other on the integration and interactions of environmental governance at different levels of the Chinese government (Schreurs, 2017; Tsang & Kolk, 2010; Zhang et al., 2020).

The next section elaborates our conceptual approach to the ETS political economy and its relevance to the analysis of China's ETS. We then outline our material collection and analytical solutions. We next present the empirical analysis of the two changes in China's ETS political economy. The findings will be discussed in the penultimate section, followed by a conclusion.

2 | ETS POLITICAL ECONOMY AND CHINA'S UNIQUENESS

Political economy reasoning has it that carbon markets are not neutral and value-free, but are political and highly politicised (Ervine, 2017; Newell & Paterson, 2010; Stephan & Lane, 2015). The neoliberal account of emissions trading promises the most cost-effective and flexible abatement strategy because the price mechanism will find the most appropriate price for environmental externalities. However, this account assumes that the markets will automatically work and

overlooks that the existing relations of political and economic power are interwoven into the very fabric of the ETS (Ervine, 2017). Despite the interest of many governments, emissions trading has not delivered cost-efficiency and carbon markets have often been in crisis without generating meaningful carbon prices. Lane and Newell (2016) coined the term 'zombie markets' to depict that carbon markets were effectively dead yet still politically unstoppable. The zombie-like development and varying design features across jurisdictions have underlined the importance of political economy analysis of ETSs, which should not be restricted to the policymaking process, but also consider the broad relations of power within which the ETS has both evolved and continues to change (Aldy, 2017; Lane & Newell, 2016; Stephan & Paterson, 2012).

The political economy analysis of ETSs is important for three reasons. First, it provides valuable accounts as to why emissions trading is preferred over other policy options. Some analysts argued that the rapid proliferation of ETSs was not just due to their proclaimed efficiency and flexibility, but also because they provide a politically feasible solution to address climate change while leaving entrenched economic and energy patterns of growth intact (Ervine, 2017; Newell, 2008). It suggests that emissions trading is an attempt by the power of global capitalism to ease the tension between accumulation and legitimation (Paterson, 2010). At the domestic level, carbon markets have enabled a new political coalition favouring decarbonisation by attracting the business sector with prospects of new profit opportunities (Paterson, 2012).

Second, the ETS design choices mirror political economy considerations (Aldy, 2017; Shen & Wang, 2019). As the ETS alters existing economic and energy structures by creating a new array of winners and losers in affected sectors, the pre-existing policy landscape must influence the policy design. Third, the ETS shapes and is shaped by the broad political economy context. The changes in the political, economic and energy circumstances all affect the ETS. This has been evident with regard to the EU ETS, which experienced price volatility after the 2008 economic crisis, failed to include the international aviation sector, has retained free allowances for certain industries and countries, introduced a market reserve policy and has seen skyrocketing carbon prices recently. This highlights that carbon markets are not neutral, and instead deeply embedded in the continuously changing political economy landscape.

China's ETS political economy is rather different from that of EU ETS. China's economy has experienced unparalleled growth over the last decades, but this has also caused many environmental problems. Within the political system, the environmental agency had long been marginalised due to the government's prioritisation of the economy until when in 2018 it was transformed into the Ministry of Ecology and Environment (MEE). At the local government level, enforcement of environmental policy has been plagued by the duality and overlap of the horizontal (*tiao*, 条) and vertical (*kuai*, 块) regulatory systems (Shen & Jiang, 2021; Tsang & Kolk, 2010). Environmentally authoritarian government relies heavily on command-and-control measures to achieve environmental goals, which has proved costly and inefficient (Gilley, 2012; Han et al., 2012). In 2010 for example, many provinces



ordered temporary shutdowns of power plants and factories to meet the energy-efficiency targets of the 11th Five-Year Plan (FYP), highlighting the inadequacy of regulatory measures. China initially did not perceive climate change as an environmental issue, but rather a scientific and economic one to be addressed by energy-saving measures (Lo, 2015). The authority of climate governance was held by the National Development and Reform Commission (NDRC) until 2018 it was moved to the MEE.

Unlike the ETSs of Western economies, China did not need to form a pro-climate political coalition underpinning its emission reduction policy given the government's dominance in the business and financial sectors. Its decision to adopt an ETS was due to its own political economy considerations. Since the 2000s, environmental problems have drawn extensive public attention, and the government sought to reconcile the interests of economic growth and environmental protection (Tang et al., 2015). Meanwhile, China's experience from the Clean Development Mechanism (CDM) had proved market-based instruments a more cost-effective and economically beneficial alternative (Ba et al., 2018; Lo, 2015).

After China surpassed the United States as the world's largest GHG emitter in the late 2000s, it has faced increasing pressure to combat climate change. The ETS offers to balance national economic, energy and climate interests. An ETS is more cost-efficient for abating GHG emissions and meeting energy intensity goals than regulation (Han et al., 2012). This resonated with the Communist Party's 'Comprehensively Deepening the Reform' strategy at the time, which sought to reform the economic system by minimising the role of government and promoting the role of markets to enhance efficiency and maximise socio-economic benefits (Chinese Communist Party, 2013).¹

China followed its philosophy of 'crossing the river by feeling the stones' by first experimenting with the ETS at the regional level. The government established eight regional pilots with varying economic and geographic conditions in 2013–2016, and used the experience to launch a national market in 2017 (Shen & Wang, 2019). Research has shown that China's ETS has been designed with features aligning to its unique political-economic conditions. China has not committed to an absolute emission reduction target and thus designed its ETS based on intensity targets. Allowances are distributed for free and are subject to within-period ex-post adjustments, so that the caps can be corrected to the actual energy consumption levels (Wang, Jotzo, & Qi, 2018). As electricity prices are controlled by the central government, the ETS includes both upstream and downstream sectors (Shen & Wang, 2019; Zeng et al., 2018). Only domestic offsets approved by the NDRC on the basis of the CDM methodology are accepted (Ba et al., 2018). Price management mechanisms have been introduced to avoid price fluctuations drawing lessons from the EU ETS (Munnings et al., 2016).

Although the ETS has shown economic and environmental potentials, it is also manifesting deficiencies and barriers which call for further reforms. First, while the intensity-based cap ensures cohesion between economic growth and energy intensity targets, it creates uncertainty for industries' abatement strategies and constrains market trading (Munnings et al., 2016). Second, the inclusion of both

upstream and downstream sectors creates a problem of double-counting, calling for reforms in the electricity market (Zeng et al., 2018). Third, state intervention has been extensive. In some pilots, the government arranged transactions and postponed deadlines to ensure compliance (Munnings et al., 2016). Last, public engagement has remained low, and a comprehensive and strong legal framework for the ETS is still lacking (Goron & Cassisa, 2017; Liu & Fan, 2018; Lo et al., 2018; Shen, 2015).

Heggelund et al. (2019, 2022) contended that China's ETS development has been a process of testing and learning, which improves ETS policy by drawing lessons from the past and regional pilots. The development of China's ETS has indeed involved many adaptive innovations derived from the complex and unique state-business and local-central government relations. While some innovations have adapted the ETS in a more efficient way across varying economic and industrial contexts, some have exposed existing institutional barriers in, for example, business engagement, industrial awareness and parochialism, which require further policy improvement (Lo & Chen, 2020; Schröder, 2012; Shen & Wang, 2019; Shen & Xie, 2018; Zhang et al., 2020).

However, it has rarely been noted that the ETS also needs to constantly adjust to the new information in its political economy environment. It is more than 10 years since China first revealed the ETS plan in 2011, and the political economy landscape of the ETS has changed significantly. Just like with the EU ETS, the evolving context will alter China's ETS considerations and practices. For China, emissions trading is not just a climate policy, but a novel attempt at governance transformation of political and economic relevance. Politically, the ETS signals the government's reform of its regulatory approach by exploiting markets to enhance efficiency. Economically, its co-benefits in green investment and technology innovation play a crucial part of China's transition towards a low-carbon, sustainable economy. Achieving these benefits would require not only a well-designed ETS but also coordinated reforms and efforts in other relevant policy areas, which are all constrained by the broad political economy environment. This highlights the need to examine the implications of China's rapidly changing political economy on the ETS. In so doing, we will focus on two recent important changes in the political economy landscape of China's ETS. The first is the change of the ETS authority in 2018. The second is the economic slowdown and its implications for the climate-energy policy complex and in particular for the country's mostly important fuel, coal. The two cases will highlight to what extent the changing political economy affects the ETS, and what are the underlying barriers for the government's net-zero targets.

In order to understand the political economy of China's ETS, this research uses qualitative research strategies drawing from semi-structured expert interviews and documentary materials such as formal government records, media reports and academic literature. We conducted 16 semi-structured interviews with representatives of the government, researchers, environmental nongovernmental organisations (NGOs) and ETS-related enterprises (an overview of the interviews is in the Appendix (Table A1)). The participants were selected based on prior research and through referral sampling methods until

an even coverage of different stakeholder groups was achieved. All participants were either directly involved in ETS activities or have experience from research on the Chinese ETS. Ethical clearance for the research was obtained from the authors' research institute. All interviews were conducted with the promise of confidentiality in Beijing, Shanghai, Shenzhen and Hong Kong between September 2018 and December 2019. Interviews were triangulated using comprehensive document research and analysed with a combination of narrative and critical discourse analysis.

3 | EMPIRICAL FINDINGS

3.1 | The change of the ETS authority

Climate change has always been closely related to China's economic, energy and technology policy agendas (Lo, 2015; Wang, Jotzo, & Qi, 2018; Wang, Liu, & Wu, 2018). Before 2018, the NDRC² was the climate policy regulator. As an economic regulation agency, it has advantages in enforcing the ETS over the environmental ministry³ given its substantial power over macroeconomic management and planning, through which it can specify climate targets, integrate them into the economic plans and align them with sectoral policies (Chang & Wang, 2010). It has also extensive power in energy governance, including setting out guidance for energy prices, approving power plant construction and promoting renewable energy and energy efficiency policies.

China's climate change governance changed significantly in 2018 when the government upgraded the MEP into the MEE. The MEE inherited the MEP's competence and the NDRC's climate authority. The department of climate change in the NDRC and its local affiliates were moved to the MEE. In June 2018, the MEE was further promoted to be the co-implementing agency of the country's leading body on climate change, the State Council Leading Group on Climate Change (SCLGCC).

A key objective of the reform was to strengthen the environmental ministry's power by bringing together the environmental competence formerly scattered across many ministries. The MEE is expected to fix China's environmental governance problems by improving administrative efficiency and lowering coordination costs. However, the reform may have mixed effects on climate policy as climate change is not just an environmental but also economic, energy and diplomatic concern. While the NDRC has broad power and leverage in those areas, the MEE may lack such power to make and implement policies by itself (Tsang & Kolk, 2010; Wang, Jotzo, & Qi, 2018; Wang, Liu, & Wu, 2018).

For years, China's environmental governance has been paralysed by weak implementation at the local level. This was largely due to China's decentralised administrative structure in which local governments are incentivised to enforce growth-oriented policies while shirking environmental protection responsibilities (Kostka & Nahm, 2017; Ran, 2013; Zhang et al., 2020). Local environmental officials face a conflict between horizontal and vertical regulatory

systems (Chang & Wang, 2010). Although local environmental departments are responsible for enforcing the policies of the central government, they are financially and institutionally subordinate to local governments. Enforcement of environmental policies is thus often undermined due to economic considerations (Schreurs, 2017). While the central government has recently sought to tackle this problem by establishing the MEE and using more inspection and disciplinary measures (Shen & Jiang, 2021), the institutional settings of local environmental departments have not been reformed and local governments are facing rising pressure of delivering imminent economic results given the current impacts of COVID-19 outbreaks and economic slowdown:

The MEE has a positive effect in integrating environmental governance. For example, now carbon monoxide and carbon dioxide are regulated by the same agency, while before they were regulated by the NDRC and the MEP respectively. However, the problem of weak enforcement may still exist, as local environmental bureaus are still subordinate to, and heavily influenced by the local governments. —Interview with an environmental journalist

In China's political system, the responsible agency's power and hierarchical ranking are crucial for policy enforcement, as this will affect how the local governments and businesses weigh the importance of the policy with relevant interests. In previous sulphur dioxide trading experiments, local environmental departments struggled with policy enforcement due to their weak authority within the administrative hierarchy and the local governments' economic interests (Tao & Mah, 2009). In contrast, the NDRC has more leverage to ensure ETS compliance (Goron & Cassisa, 2017):

To firms, the orders from the NDRC and from the environmental agency are different. Obviously, they will pay more attention to the former. —Interview with an academic scholar in environmental politics

The rapid ETS development has been largely motivated by the government. The government dominates the ETS, and has a great influence on the price. So the authority change could affect policy enforcement. —Interview with an academic scholar in environmental economics

The transfer of authority has changed the way how climate, economic and energy policies are coordinated. Before 2018, the coordination could be achieved within the NDRC through its extensive power over the three policy areas. Now coordination has to happen through inter-ministerial communication and collaboration between the NDRC and the MEE. It is uncertain whether the MEE has sufficient leverage on the NDRC, if the latter prioritises economic and energy interests over climate change:

**TABLE 1** Key authorities relevant for carbon finance regulation in China

	Ministry of Ecology and Environment (MEE)	Securities Regulatory Commission (SRC)	People's Bank of China (PBC)
Competence	<ul style="list-style-type: none"> Responsible for the design, implementation and supervision of the ETS, setting up the market infrastructure for carbon finance. Supervising the spot trading of carbon allowances. 	<ul style="list-style-type: none"> Formulating the policies, regulations and standards concerning the securitisation of carbon assets and the futures contracts of carbon allowances. Overseeing issuing, trading, custody and settlement of equity shares, bonds, and investment funds concerning carbon assets. Overseeing the listing, trading and settlement of carbon futures contracts, carbon futures exchange and relevant firms. 	<ul style="list-style-type: none"> The leading authority of China's green finance development. Formulating the policies, regulations and standards of financing and investment concerning the carbon finance market.
Interests and goals	<ul style="list-style-type: none"> Climate change mitigation Stability of carbon prices Cost-efficiency of emissions abatement 	<ul style="list-style-type: none"> Stability of the securities and futures markets Price discovery and hedging 	<ul style="list-style-type: none"> Establishing a sound and stable green finance system to support the real economy and promote ecological civilisation Stability of China's financial markets.

Source: Authors' own creation based on each agency's competence and goals in relevant documents.

The MEE lacks the ability to influence the NDRC when the NDRC decides to de-prioritise climate policy.
—Interview with an academic scholar in environmental politics

A recent example echoing this concern is the NDRC's 14th FYP for a Modern Energy System (NDRC & NEA, 2022), which specifies plans for the country's energy sector up to 2025. Unlike previous FYP energy plans, it sets no limits on coal consumption or the share of coal in primary energy sources. Instead, it emphasises the importance of coal for the country's energy security, drawing lessons from the previous year's coal and electricity shortages. In 2021, the coordination of climate policies was further complicated as the NDRC took the responsibility for coordinating the policies to achieve the national targets of carbon peak and carbon neutrality. It will compile a national roadmap for emission reduction, including plans for cleaning up carbon-intensive sectors and promoting low-carbon technologies. It is also the implementing agency for the newly established leading group on the dual-carbon targets which consists of high-profile officials from several ministries and is headed by the Vice Premier. While the MEE remains the regulator of the country's climate policy, emission reduction now falls into the competence of both the NDRC and the MEE.

Concerns of interest coordination also arise with regard to carbon finance,⁴ which involves financial regulators such as the Securities Regulatory Commission (SRC) and the People's Bank of China (PBC) with different policy priorities (see Table 1). Signs of such conflicting priorities were seen before the MEE took over the ETS authority. In 2016, the NDRC drafted an ETS proposal to the State Council for legislation in order to upgrade the ETS legal status.⁵ The proposal included carbon futures as one of the commodities in the system. The SRC as the financial market regulator opposed the plan due to concerns for incomplete market infrastructure and potential instability, but its objection was

overruled by the NDRC. However, in the same year when rectifying the financial market orders, the SRC affirmed that the ETS is disallowed from the securitisation and trading of futures contracts (SRC, 2016). Then in 2017, the NDRC changed its attitude and started to emphasise the importance of financial stability in the ETS and only allowed spot trading in the upcoming national market (NDRC, 2017). In 2020, the MEE as the new authority issued its first ETS regulation including no financial instruments related to carbon.

The hedging on the financial aspects of the ETS underlines a predicament in which the government seeks to develop green finance for its economic benefits but also fears the associated financial risks due to incomplete market infrastructure. Since 2016, China has launched several initiatives to develop green finance to underpin its strategies of economic transition and ecological civilisation. In 2016, the PBC released the Guidance on the Establishment of Green Finance Framework to initiate an experiment on green finance (PBC, 2016). In 2017, it further instructed the NDRC to launch the national ETS by 2017 to build market infrastructures for carbon finance (PBC, 2017). An annual report on green finance has also been released since 2017. In 2018, the PBC was included as a member to the country's top leading body on climate change, the SCLGCC. The same year, the PBC and the SRC established the Committee on Green Bonds Standard, and the MEE also established the Committee on Climate Investment and Financing. In 2019, the State Council issued a plan to establish a futures exchange in Guangzhou that will include carbon futures as the first commodity. However, despite the green finance initiatives, China's ventures have been limited due to the concerns for financial risk and inadequate market infrastructure (Lo et al., 2020):

Carbon finance and the financialisation of the carbon market are different. The government likes the idea of carbon finance because it can attract investment. But

about the financialisation of the carbon market, drawing lessons from the past stock market catastrophe, the government is concerned about the potential financial risk. —Interview with an academic scholar in environmental politics

The ETS should mainly serve as a policy to reduce emissions. So it should avoid over-financialisation. —Interview with a provincial NDRC officer

Carbon finance also faces challenges due to immature market infrastructure. Market liquidity is low, which does not support trading on financial goods. In the absence of an absolute and quantified emission reduction target and due to the global energy crisis, the carbon price in China still faces many policy uncertainties:

The market infrastructure is not sufficient to support the trading of carbon futures now. The biggest concern is financial risk. The low market liquidity cannot attract financial institutions, and also has the risk of market manipulation. —Interview with an academic scholar in environmental economics

Regarding carbon finance, preventing financial risk is always the primary concern of policymakers. The lack of market infrastructure is not realistic to financialise the ETS at the beginning. —Interview with a provincial-level environmental officer

Spot trading and futures trading are regulated by different agencies with different policy stances. While the MEE as the spot trading regulator focuses on emission reduction, the SRC as the financial regulator focuses on price discovery and hedging:

There are still disputes among different regulators. The attitude of the government on carbon finance remains uncertain until further regulation is released. —Interview with an asset management fund manager in financial sector

The above observations highlight the fragmentation of ETS governance. The authority change in 2018 has broken up the economic, energy and climate dimensions of ETS governance, which now requires more inter-ministerial coordination between the NDRC and the MEE than before. The authority change was partly reversed when the responsibility for achieving dual-carbon targets was assigned to the NDRC while the MEE remains responsible of climate governance. In China, carbon finance is administered and supervised by the PBC and the SRC whereas the MEE lacks both experience and competence. Carbon finance policies are not determined by the MEE solely and it faces competition from the country's financial regulators with varying policy priorities and interests.

3.2 | The climate-energy policy complex amid economic slowdown

In China's energy mix, coal accounts for nearly 60% of total energy consumption and for about 70% of China's GHG emissions.⁶ Excessive coal consumption has contributed to severe air pollution, triggering public dissatisfaction and threatening social stability (Flatø, 2022). The ETS offers to balance the aims of environmental protection, energy security and economic growth. By providing a strong price signal, it can incentivise industries to switch to cleaner energies and invest in low-carbon technologies. Industries are allowed flexibility to decide their abating strategies so that emission reduction can be achieved at the lowest cost. Moreover, it echoes the government's reform of its economic and environmental governance, exploiting markets to enhance efficiency.

Yet, the materialisation of those benefits are constrained by China's energy political economy. Many features of its energy sector are inhospitable for emissions trading, such as the highly regulated electricity market, explicit and implicit subsidies on fossil fuels and the government's regulatory and planning approach in energy governance (Ren et al., 2021; Wang et al., 2021; Yuan et al., 2019; Zhang et al., 2018). Reforms in these policy areas are thus needed for the ETS to achieve flexibility and cost-efficiency in GHG abatement. For China, the tensions between the long-term socio-economic imperatives and the short-term economic interests are key in determining climate policy pathways (Purdon, 2015). Studies have found that even as the long-term benefits of low-carbon energy transition are widely accepted in China, concerns over its short-term economic impacts still trigger resistance of local governments and entrenched interest groups (Shen & Xie, 2018; Tan et al., 2021; Zhang et al., 2020). Ensuring economic growth and energy security, at least in the short run, is still a defining factor for China's climate policy.

The ETS is an artificial market: the carbon price is determined by the political economy of market design which reflects the broad configuration of interests in relation to climate change (Ervine, 2017). The government's short-term economic prioritisation may thus constrain the ETS function, entrenching the incumbent energy political economy dominated by fossil fuel industry. The influence of economic prioritisation could be more pressing now as China has been dealing with economic slowdown, the COVID-19 Pandemic and the ensuing global recession. We examine next how the slowing economy affects the ETS by focusing on the recent dynamics of China's coal political economy. Coal is closely related to China's short-term economic interests and the ETS as it dominates the power sector and key industries with strong carbon lock-in and path dependence in energy transition. Reducing coal consumption has become a cornerstone for China's emission reduction efforts (Heggelund et al., 2022). The government's stance over imminent economic boost and coal phase-out will thus reflect its considerations of climate change mitigation and institutional reforms which affect carbon price and market confidence.

To date, the prices and market liquidity of China's ETS have had limited impact on the energy sector. As of 2020, eight regional



markets had traded a total of 425 million allowances worth 1.56 billion dollars. The average prices ranged from \$1.5 to \$4.7 per ton (Slater et al., 2020). The national market had its first compliance year by 2022 covering only the power sector. The market traded 194 million allowances with an average price of \$6.5 per ton.⁷ Compared with the EU ETS prices which have reached around \$90, it is clear that the prices in China's ETS have been rather low.

The market liquidity and prices now are not sufficient to reflect the economic dynamics. Sometimes firms do not even see the price signal in their abatement strategy. —Interview with an academic scholar in environmental politics

Covered companies also suggest that they do not attach much importance to the ETS (Deng et al., 2018; Liu & Fan, 2018; Shen, 2015):

Because of the slow progress of the national carbon market and little attention from the central government, leaders of the company have not paid too much attention to the ETS. —Interview with a state-owned enterprise in iron and steel sector

We don't have employees to work exclusively on the carbon assets and trading, the work is usually shared by some departments before the compliance deadline. —Interview with a state-owned enterprise in power sector

As China's economy is slowing down, pessimism has emerged on ETS stringency:

The pressure of the economic downturn can impact China's climate policy as the government may relax its climate policy stringency. —Interview with an academic scholar in climate economics

Over the past decade, China's coal political economy has experienced significant changes. After 2008, as the government sought to stimulate growth via a massive infrastructure projects, China's coal consumption skyrocketed, reaching its highest ever level in 2013. The infrastructure building stimulus also contributed to severe air pollution and high GHG emissions and led to pressure from both domestic and international communities to address the energy use. The government faced the imperative to reduce its reliance on coal in the early 2010 s.

Addressing air pollution was obviously the primary motivation of the government to reduce coal consumption then. But reducing coal consumption could also benefit climate change mitigation. —Interview with an environmental NGO

At the time, the government also needed to reduce overcapacity in the energy sector, because the massive scale of coal-fired power plant construction had surpassed the country's need and many plants were not in full operation (China Electricity Council, 2013).

As a result of more and more coal plants, many existing plants only operate part-time. This is a waste of investment and capacity. —Interview with an environmental NGO

Central government used to have the authority to approve new coal power projects. To reduce overcapacity, China decentralised the authority to local governments in 2014 so that approval decisions could be made in light of their circumstances. The authority of approving environmental impact assessments of new coal plants was also decentralised to provincial environmental bureaus in 2015 (Shearer et al., 2018). The decentralisation turned out to be counterproductive. Provincial governments raced to permit new plants for economic and security considerations (Tan et al., 2021; Wang et al., 2021; Zhang et al., 2018), further aggravating overcapacity.

Building coal plants was beneficial to local economies, as it could boost investment and production in many sectors. —Interview with an environmental NGO

In 2016, the NDRC and the NEA stepped in by suspending or cancelling the construction of coal plants in most provinces (NDRC & NEA, 2016). The government also set an 1100 Gigawatt (GW) capacity cap on coal power in the 13th FYP. As a result, China's coal consumption decreased to 3.8 billion tons in 2016:

A capacity of 1100 GW cap in the 13th FYP is undoubtedly the most powerful policy to limit the construction of coal plants, and local governments have to cease many ongoing projects to control their capacity under the cap. —Interview with a provincial-level NDRC officer

However, due to the deteriorating economic environment, China's coal consumption has rebounded since 2017 as the government has stimulated growth with infrastructure investment. The production of iron and steel, cement and other building materials has increased, which has increased coal consumption and GHG emissions (IEA, 2019):

The government used to boost the economy via infrastructure investment and construction. However, given the substantial debts of local governments, the central government may be more cautious this time. But it may still put aside the stringency of fossil fuels to reduce the burdens of industries. —Interview with an academic scholar in environmental economics

The power sector has also been revitalised. In 2017 and 2018, its coal consumption increased by 4.9% and 6.4% respectively (Xinhua, 2019). Local governments started to invest again in new coal power projects to promote growth. New coal power capacity skyrocketed in 2019 and 2020 as local governments rushed to use the last chance to build new capacity in the 13th FYP (Greenpeace, 2021). The coal reliance threatens economic and energy security. In late 2021, several provinces experienced power cuts and blackouts, as power plants faced soaring energy prices and mandatory limits on their coal consumption. The U-turn of coal consumption highlights the dilemma between climate change mitigation and short-term economic growth, given the significance of coal to the economy, especially to the local governments:

From a long-term perspective, certainly the economy will phase out coal eventually. But a short-term rebound is still possible, if coal consumption proves cheaper.....Moreover, it should be noticed that the coal industry is still influential, especially in some regions. —Interview with a provincial NDRC officer

Local governments do not want to shut down coal plants, because this will waste the investment before and cause unemployment. —Interview with an academic scholar in climate economics

Due to the highly regulated electricity prices, rallying coal prices and increasing costs of complying with environmental regulations, coal power business is no longer attractive for state-owned enterprises (Tan et al., 2021). However, local governments still have economic and security stakes. Some governments, especially those in coal rich regions, rely on revenue and employment from coal-related industries (Mori, 2018). Some also pursue self-reliance due to the concerns of potential disruption of inter-provincial electricity transmission (Wang et al., 2021).

The central government's stance has also wavered. In the 26th United Nations climate change conference in Glasgow, China supported India in changing the language on coal from 'phase-out' to 'phase-down'. In addition to removing limits on total coal consumption and the share of coal in primary energy mix in the 14th FYP (NDRC & NEA, 2022), it also plans to increase coal production capacity and provide more financial support for coal industry (Xinhua, 2022a, 2022b).

Given the strong lock-in effect of coal on China's energy transition, the government has invested heavily in energy efficiency and clean coal technologies to reduce the environmental impacts. It has upgraded most of the existing coal power plants to meet efficiency standards (Chinese Government, 2019). But investment in energy efficiency can also affect the ETS by reducing compliance costs of coal power plants and prolonging their life-spans (Wang, Jotzo, & Qi, 2018; Wang, Liu, & Wu, 2018; Yuan et al., 2019). Also, the investment has mostly targeted air pollutants instead of GHG emissions:

Compared with the CO₂ emissions and greenhouse effects, the government is more concerned about the impact of air pollution from coal. —Interview with an environmental journalist

Although supporting clean coal technologies is pragmatic in a coal-dominant energy economy, it is misleading to label clean coal as green. In 2017, China identified clean coal as one of its strategic fields for technology investment (Xinhua, 2019). In 2019, clean coal was included in the government's Guiding List for Green Industries, which offers preferential policies and financial support to clean coal technologies and investment (NDRC, 2019). The scope of the Guiding List was adopted by the MEE in 2020 to guide investments and financing regarding climate change (MEE, 2020).

China's coal phase-out is challenged by short-term economic interests. The ETS is still immature and has limited effect on energy transition. Local governments still rely on revenue and employment from coal industry, which is a structural barrier for coal phase-out. While the central government has shown determination on coal phase-out, its stance has recently wavered due to economic and security concerns. The swing could slow the reforms in relevant policy fields, further constraining the ETS functions.

4 | DISCUSSION

China's environmental governance has been characterised for long by economic prioritisation and authoritarian environmentalism. However, the pursuit of growth proved unsustainable in the late 2000s due to environmental degradation and mounting GHG emissions (Tang et al., 2015). The command-and-control approach also needed reform to enhance efficiency (Han et al., 2012). The ETS emerged to help amalgamate economic, energy and climate interests in the early 2010s. (Lo, 2015). The market-based policy resonated with the government's 'Comprehensively Deepening the Reform' ideology, which sought to reform its mandatory governance approach and enhance efficiency by utilising markets (Chinese Communist Party, 2013).

However, the realisation of those benefits are constrained by the particularities of China's political economy. The political economy landscape of the ETS has changed significantly after China firstly brought up the policy in 2011. We have examined two major changes that are of great importance for the ETS functioning: (1) the change of the ETS authority and (2) the economic slowdown and its implications for the climate-energy policy complex. Our starting point was that the contextual political economy is fundamental to the ETS functioning, as it affects the policy design, the reforms in relevant fields and the policy effects in both prices and institutional practices. The validity of this starting point has been established in the context of the EU, where the ETS has been demonstrably shaped by the changing political economy.

We first focused on the change of the ETS authority from the NDRC to the MEE in 2018. Although the MEE has been upgraded to



consolidate China's environmental competence and strengthen the enforcement of environmental policies, the authority change also likely increases the costs of coordinating climate change, economic, energy and financial policies. The NDRC had advantages in ETS governance as it could incorporate the ETS targets into economic and energy policies (Chang & Wang, 2010), and had more leverage to ensure compliance (Goron & Cassisa, 2017). The authority change split the economic-energy and climate dimensions of the ETS into two agencies. After the NDRC has regained the responsibility for emission reduction to attain the dual-carbon targets, the coordination of the ETS with the country's economic and energy strategies has been further complicated.

Carbon finance is another example of tensions among competing authorities. Carbon finance falls into the MEE's competence but it also involves the supervision and authority of the PBC, the SRC and the NDRC since it falls under the broad policy framework of green finance. Priorities and interests of competing agencies are thus a defining feature of carbon finance policy. The MEE as the environmental regulator is primarily motivated to promote investment and financing policies to achieve climate targets. In contrast, financial regulators such as the PBC and the SRC focus on market stability due to the past catastrophes in China's stock market and the spillover effects of the financial markets (Cao et al., 2022; Lo et al., 2020). Concerns about carbon financial market instability stem from the immature legal and market infrastructures. The dominance of a handful of state-owned enterprises could also result in market manipulation and speculation. The MEE lacks expertise and competence in financial regulation, and needs to rely on other authorities to design and implement policies. Therefore, prudence and stability have become central to China's carbon financial market, allowing only spot trading and a scattering of financial experiments by far.

Next, we reviewed the recent dynamics in China's climate-energy political economy, assessing the implications of the recent economic slowdown to the ETS institutional environment. Climate policy involves the tensions between short- and long-term interests (Purdon, 2015). In China, this is reflected in the government's hedging on its most important fuel: coal. Despite the broad agreement on the long-term socio-economic imperatives of coal phase-out, the economy still heavily relies on coal for short-term growth and energy security. Short-term interests are especially important for local governments that are incentivised to deliver strong economic performance, whereas the benefits of environmental regulations are longer-term and more difficult to quantify (Tan et al., 2021). The ETS has only had limited impact on the energy sector to date due to low carbon prices and market liquidity, and it faces many structural barriers such as the subsidies on fossil fuels, the highly regulated electricity market and impediments to renewable energy development. The government is accustomed to curb coal consumption with command-and-control policies. A functional ETS thus requires reforms in interconnected policy areas, which are constrained by the government's stances over the long-term interests and short-term impacts associated with climate policies. Although the government has ratcheted up efforts to reduce coal

reliance since the early 2010s, we found that its stance has wavered recently due to economic slowdown and the associated shift towards short-term priorities. Stringency of coal phase-out policies has waned at both the central and local government levels, and the country's coal consumption has rebounded as a result.

The two cases highlight a key challenge for China's climate policy: climate change remains less important than other priorities in the political agenda. In both cases, the interests and priorities of central authorities and local governments overrode climate policies, disturbing the ETS political economy. But the recent national dual-carbon targets may provide new momentum. By prioritising emission reduction in the country's political and economic agendas, they can create new incentives for bureaucratic agencies and local governments to implement climate policy. However, the impact of the deteriorating economic environment should not be underestimated. China's climate policy is still overshadowed by short-term economic interests, as the government clings to achieve its growth targets despite the mounting costs of doing so.

Our research makes several theoretical and empirical contributions. Theoretically, we complement the ongoing political economy debates of emissions trading, adding that not only the ETS itself is a product of evolving political-economic circumstances, but also its implementation and performance are continuously shaped by the changing context. This has particular relevance to the current research on global climate policies. The drastic changes in global economic and geopolitical circumstances, along with the varying domestic factors and priorities, have informed distinctive political economy considerations across jurisdictions in regard to combating climate change. Tailored political economy research perspectives are thus of more importance in understanding the complexity of climate politics across countries and regions. Empirically, we have inquired about the impacts of the recent political reform and the evolving economic-energy circumstances on China's ETS, exploring the potential barriers to the implementation of the policy and generating new empirical insights. We argue that the tensions between the long-term socio-economic necessities and the short-term economic interests are defining factors for the ETS functioning, and such tensions could be further magnified by the current political-economic upheavals.

5 | CONCLUSION

China's climate policy has been constrained by the tensions between long-term socio-environmental necessities and short-term economic interests. Although the ETS provides a solution with economic co-benefits, its implementation and effects are still determined by the broader political-economic environment. We in this paper have explored the evolving context of China's ETS by focusing on the implications of two recent dynamics: (1) the change of the ETS authority and (2) the economic slow-down and its implications for the climate-energy policy complex. We find that the ETS in China is still overshadowed by the imminent economic interests and priorities of central authorities and local governments, which suggests that climate change has remained a topic with lower priority. The recent national targets

of achieving carbon peak and carbon neutrality may offer a fix by prioritising emission reduction in the political and economic agendas. Yet, as the economy is faltering due to the COVID-19 outbreaks and other geopolitical upheavals, imperatives of economic growth could again dominate the agenda and undermine climate policy ambitions. Future research is therefore needed on the implications of the deteriorating economic circumstances and the dual-carbon targets on China's climate ambitions.

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ORCID

Zexiang Wang  <https://orcid.org/0000-0003-3686-7055>

Jouni Paavola  <https://orcid.org/0000-0001-5720-466X>

ENDNOTES

- While some argued that in recent years China's environmental governance has experienced a process of politicisation with strong party disciplines (Shen & Jiang, 2021), in parallel, the market has still been repeatedly stressed as a crucial mechanism in resources allocation to promote governance efficiency on various occasions by the government and the Communist Party.
- The NDRC (National Development and Reform Commission, 国家发展和改革委员会), formerly State Planning Commission and State Development Planning Commission, is a macroeconomic management agency with broad administrative and planning control over the economy. It has a higher administrative rank than most of the ministries in the government with the reputation of the 'mini-state council'. During 1998–2018, it was the competent authority of China's climate governance given the issue's economic, energy and diplomatic relevance. It also administrates the National Energy Administration (NEA, 国家能源局) responsible for formulating and implementing China's energy policies.
- Before 2018, the Ministry of Environmental Protection (MEP, 环境保护部) did not have the authority of climate governance and was plagued by the problem of weak local enforcement of environmental regulations. In 2018, the MEP was upgraded into the MEE (Ministry of Ecology and Environment, 生态环境部) that has absorbed the climate change authority from the NDRC.
- Carbon finance (*tanjinrong*, 碳金融) refers to financial instruments and investments applied in the ETS, such as futures, bonds, loans, equities and other forms of contracts concerning the trading of carbon allowances.
- In 2014, the NDRC issued the first ETS regulation to guide domestic ETS activities (NDRC, 2014). As a departmental regulation, it had the lowest binding force in the legal system. The NDRC thus attempted to strengthen the ETS legal status in 2016, but due to the workload of the State Council, the proposal was shelved.
- Data from National Bureau of Statistics of China and Statista.
- Data from Shanghai Environment Energy Exchange.

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APPENDIX

TABLE A1 Interview list

No.	Date	Interviewee
1	09.2018	Academic scholar in environmental politics
2	10.2018	Academic scholar in climate economics
3	10.2018	Environmental NGO representative
4	11.2018	State-own enterprise in iron and steel sector
5	11.2018	Academic scholar in environmental politics
6	11.2018	Provincial-level NDRC officer
7	11.2018	Environmental NGO representative
8	12.2018	Academic scholar in environmental politics
9	12.2018	State-own enterprise in power sector
10	12.2018	Provincial-level environmental officer
11	04.2019	Provincial-level NDRC officer
12	04.2019	Environmental NGO representative
13	07.2019	Environmental journalist
14	09.2019	Environmental journalist
15	10.2019	Academic scholar in environmental economics
16	12.2019	Asset management fund in financial sector