

Can Autocracy Handle Climate Change?

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ABSTRACT

Existing literature on climate politics predominantly concentrates on democracies. However, there is a pressing need to examine how authoritarian regimes respond to climate change, given their growing impact on global carbon emissions and their populations' acute climate vulnerability. Extant research often assumes that authoritarian regimes have inherent advantages in addressing climate change, leading to overly optimistic perspectives on their capabilities. This study highlights the necessity of qualifying those assumptions and evaluates the comparative advantages and disadvantages of autocracies relative to democracies throughout the policy process: policy formulation (or outputs), implementation, and outcomes. I argue that whereas climate-conscious autocracies may efficiently produce policy outputs based on scientific evidence, they often face more challenges related to information about local enforcement during implementation. This may result in greater hurdles than democracies, even with adequate state capacity and monitoring infrastructure. Furthermore, this analysis contends that a country's developmental stage, rather than its regime type, is related more directly to the effectiveness of translating implementation efforts into tangible policy outcomes. Therefore, this article posits that the political science discourse, which often juxtaposes democracies with autocracies, should expand its scope to better understand how a country's developmental level influences the success of its climate strategies.

In 2015, Robert Keohane underscored the urgency that political science had not dedicated sufficient attention to the politics of climate change despite its potential contributions (Keohane 2015). Since then, there has been a noticeable increase in political science publications focusing on climate politics, with some articles appearing in general political science journals. However, this surge remains largely confined to developed democracies (for recent examples, see Bayer 2023; Beiser-McGrath and Bernauer 2024; Pereira et al. 2024). The overwhelming focus on developed democracies can be attributed to two primary factors. First, compared to authoritarian countries, developed democracies historically have adopted a more proactive approach to climate change and have more diverse points of climate action and obstruction (e.g., voters, firms, different levels

of government, and NGOs), thereby providing a more extensive and richer context for scholarly analysis.¹ Second, these democracies maintain more transparent and robust measurement and data systems, offering researchers easy access to high-quality, longitudinal data crucial for detailed studies that address important questions with clean causal identification.² In contrast, studying authoritarian climate politics can be more difficult in those regards.

The notable gap in research at the intersection of climate-change politics and authoritarianism becomes particularly concerning when considering the increasingly significant role of authoritarian regimes in global carbon emissions and absorption, coupled with their governance of populations that are highly vulnerable to climate impacts. First, on carbon emissions, authoritarian countries are increasingly contributing to global carbon emissions. Figure 1 lists 13 authoritarian countries that were selected based on the availability of country-level CO₂-equivalent

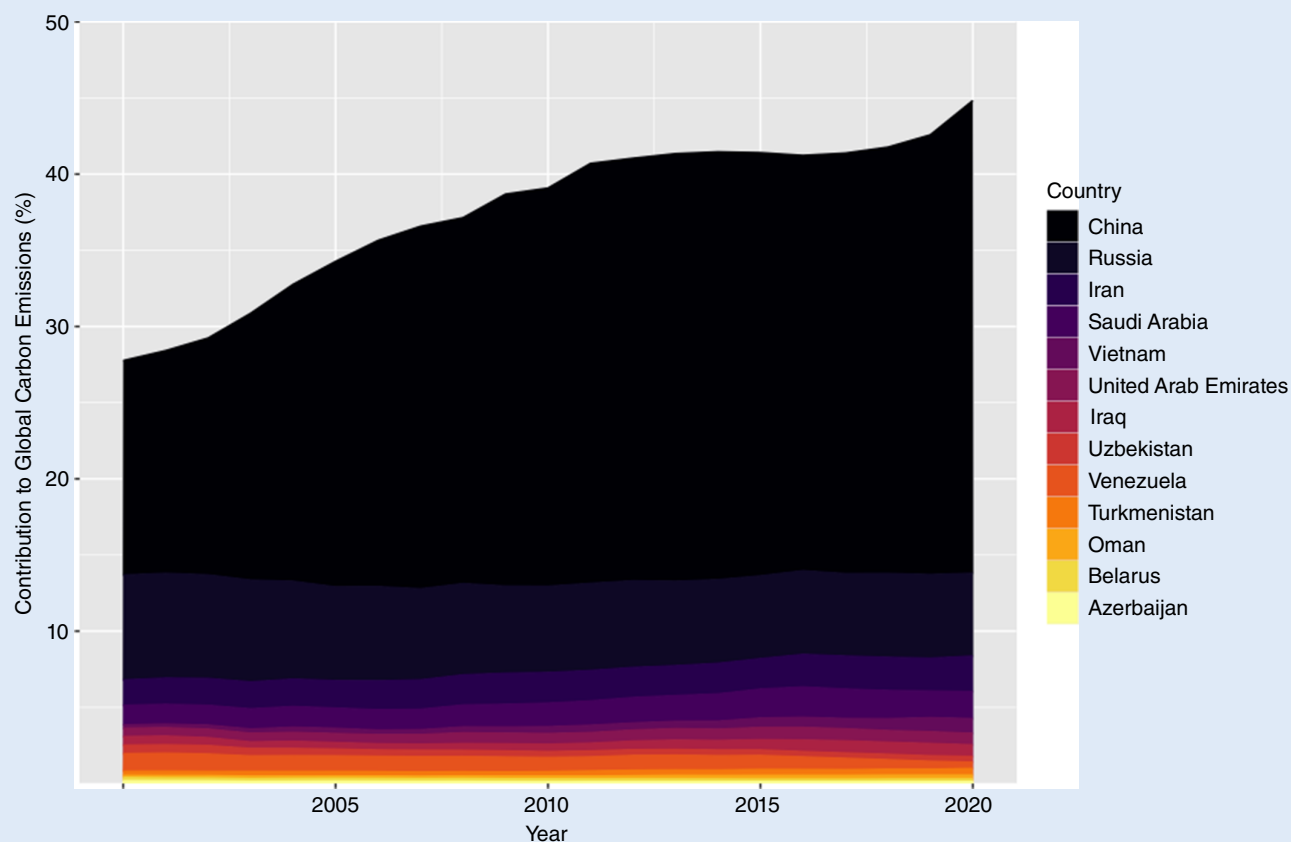
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Figure 1

Annual Percentage Contribution to Global CO_{2e} Emissions from 13 Authoritarian Countries, 2000–2020

Source: "Statistical Review of World Energy" (Energy Institute 2023)

(CO_{2e}) emissions data from the "Statistical Review of World Energy" (Energy Institute 2023) and that collectively were responsible for approximately 28% of global CO_{2e} emissions in 2000 (Shen 2024).³ By 2020, these countries had increased their contribution to 45%. Notably, that increase primarily was due to the rapid growth in emissions from China, the world's largest carbon-emitting country since 2006. China's emissions surpassed those of developed countries combined in 2019, and it is on a trajectory to overtake the United States as the most significant historic carbon emitter in the future (Larsen et al. 2021). Furthermore, regarding carbon absorption, several authoritarian countries—especially Russia and China—are projected to become the most significant global carbon sinks (Jiang et al. 2021), making their climate policies all the more important to the rest of the world.

change. Therefore, the imperative to gain a better understanding of authoritarian responses to climate change is more pressing than ever.

Can autocracy handle climate change?⁴ Extant literature indicates that authoritarian governments may possess substantial advantages over their democratic counterparts (Beeson 2010; Gilley 2012). Two primary considerations support this perspective. First, authoritarian regimes benefit from centralized policy making, which limits the influence of potentially opposing actors (e.g., businesses). Additionally, unlike democratic leaders, authoritarian rulers are not pressured to prioritize citizen demands favoring short-term personal benefits over long-term climate goals (Jamieson 2014). Because climate mitigation typically offers global benefits at the expense of localized costs, it

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Second, autocracies often govern large populations and tend to be underdeveloped, which leaves their citizens with insufficient resources to cope with the escalating impacts of climate

change. Therefore, the imperative to gain a better understanding of authoritarian responses to climate change is more pressing than ever.

Second, authoritarian regimes can swiftly mobilize people and resources, leveraging coercive capabilities to restrict individual freedoms and focus attention, efforts, and resources on their priority issues without hindrance. Consequently, climate-conscious autocracies effectively may curb individual, group, and organizational carbon emissions. This form of governance has been termed “authoritarian environmentalism” and is characterized by authority concentrated in a few executive agencies, limited public participation in policy making or implementation beyond state-led mobilization, rapid policy outputs, and constraints on individual freedom (Beeson 2010; Gilley 2012). Some scholars argue that as current democracies struggle to address climate change promptly and effectively, authoritarian approaches to climate governance may become more commonplace and necessary (Beeson 2010; Fiorino 2018; Shearman and Smith 2007). In the face of climate change, influential scientist James Lovelock once remarked, “It may be necessary to put democracy on hold for a while” in favor of allowing a few uncorrupt authorities to make science-based decisions that impose restrictions on personal freedom (Hickman 2010).⁵ Such an exercise of authoritarian power is deemed legitimate in democracies during crises, serving to fulfill citizens’ essential safety needs (Barry and Smith 2008; Mittiga 2022).

Although “authoritarian advantages” in swiftly enacting policies and mobilizing resources are acknowledged, a nuanced perspective is necessary to address the overly optimistic view regarding authoritarian capabilities in handling climate and environmental crises. This article presents a more balanced understanding by examining the comparative advantages and disadvantages that autocracies encounter across the three phases of the policy process: policy formulation (or outputs), implementation, and outcomes. It contends that although climate-conscious and science-based autocracies may be more effective at producing sound climate-policy outputs, they might face greater challenges in information asymmetry regarding

characterizations are made about authoritarian regimes, this study places particular empirical emphasis on China due to its status as the primary authoritarian country contributing to global carbon emissions and its emerging role as a global leader in the fight against climate change.

POLICY OUTPUTS

Authoritarian regimes often are perceived—not without justification—as more efficient than democracies in generating policy outputs. This efficacy is attributed to the concentration of policy-making powers within a few key agencies, which often rely on expert scientific advice. Unlike in democracies, the policy-making process in authoritarian regimes tends to be more insulated from those societal interests that might oppose climate policies. These include businesses concerned about economic repercussions, citizens apprehensive about personal costs, and politicians who may resist policies based on partisan and ideological grounds or electoral considerations (Cain 2023). Such resistance also includes skepticism about the government’s ability to effectively manage a profitable energy transition (Gazmararian and Tingley 2023). In contrast, democracies are criticized for their structural inefficiencies in addressing climate challenges. Critics highlight that democratic policy-making processes often are cumbersome and susceptible to influence by special interests, which can impede swift and effective action (Mildenberger 2020).

However, it is crucial to note that a prerequisite for the authoritarian advantage is that the authoritarian leadership must prioritize climate change and convey a strong political signal throughout the political hierarchy about its conviction. Governments in every country have multiple goals, including economic development, poverty alleviation, education access, healthcare, sustainability, and energy security, which can be contradictory. For example, the tradeoff between pursuing economic growth or recovery and environmental protection is a classic dilemma (Shen

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local enforcement. This results in more implementation hurdles compared to democracies—even with sufficient state capacity and monitoring infrastructure in place. Translating policy implementation into policy outcomes, particularly in hard-to-abate industries and sectors, depends on the possession and application of necessary knowledge, technical expertise, and supportive regulatory frameworks, which are not inherently tied to a country’s regime type. This article concludes by proposing that the ongoing discourse on countries’ climate actions should emphasize the development level as much as the regime type. Whereas general

2022). Only after the 2012 Eighteenth Party Congress did the Chinese leadership seriously address environmental protection and shift its focus to climate change. In the preceding decade, environmental protection (e.g., sulfur-dioxide reduction) was a key state policy but sometimes was sacrificed for goals that local leaders deemed more critical for their promotion (Shen 2022). Because most authoritarian countries are still developing, some leaders may not prioritize climate goals over development goals and thus may not fully realize their authoritarian advantage in climate policy making.

Moreover, another often-assumed precondition for authoritarian advantage is that climate policies are made based on scientific evidence. For instance, China's official guiding principle for responding to climate change is "to fully implement a scientific outlook on development...using scientific and technological progress as support" (State Council 2008). The national target to reduce climate intensity (i.e., CO₂ emissions per unit of GDP) by 40% to 45% was established based on scientific studies conducted by the National Development and Reform Commission, China's chief state agency for policy planning (Gilley 2012, 290).

POLICY IMPLEMENTATION

The second phase in the policy process is implementation, which hinges on two critical preconditions for successful execution. First, sufficient state capacity—typically measured by staff and funding—is vital to prevent a mandate from becoming an "unfunded mandate," a risk that is present in both democracies and autocracies. Second, a reliable measuring, reporting, and verification (MRV) system at the monitored-unit level (e.g., firms) is essential for measuring and monitoring quantifiable progress toward specific goals. However, authoritarian countries still lag behind developed democracies such as the United States, the United Kingdom, and the European Union in establishing robust MRV systems. For instance, China issued an implementation plan for establishing a standardized and unified carbon emissions MRV system only in August 2022, and recent developments are still at a relatively early stage. The two preconditions can be intertwined. For example, the integrity and verification of firm-level carbon-emissions data under China's national carbon emissions trading scheme (ETS) can be compromised by inadequate funding from provincial environmental departments.

In the implementation of policies, the principal (i.e., legislator) delegates responsibilities to the agents (i.e., local implementers such as bureaucratic agencies). In both autocracies and democracies, an agency dilemma arises when (1) the interests of the principal and the agents are misaligned, and (2) the principal lacks complete information about the actual implementation by the agents. Contrary to popular belief, principals in autocracies can be less informed about agent activities than in democracies, partly due to insufficient alternative information channels beyond official sources. This information gap can lead to a more significant implementation gap.

When institutions—such as rules, regulations, laws, and policies—fail to shape and restrain agent behavior, the principal relies primarily on two main approaches known as the "police patrol" and the "fire alarm" to monitor agent behavior (McCubbins and Schwartz 1984). The police patrol involves centralized, direct, and resource-intensive inspections by the principal. In contrast, the fire-alarm approach relies on interested third parties (e.g., citizens and civil society) to monitor and report violations. Compared to autocracies, democracies have a notable advantage in having better-informed and more active third parties who are less apprehensive about potential repercussions. These entities readily act as low-cost "fire alarms" for the principal in uncovering instances of agent noncompliance. This proactive involvement provides the principal with valuable information to impose punishment and claim credit for taking corrective actions.

To address their more significant information gaps, autocracies resort to police patrols to monitor and discipline agent noncompliance, which incurs high costs for both the principal and the public. These patrols are usually manifested in targeted inspection campaigns that mobilize people and resources, coerce compliance, and impose punitive measures to ensure adherence to state policies. Historically, these campaigns have been instrumental in implementing key state policies such as grain procurement, crime crackdowns, and political purges (Oi 1989; Perry 2007; Rigby 1968; Tanner 2000; Teiwes 1993). In recent years, China has refined this approach with what are termed by Shen, Wang, and Zhang (2023) as "regularized campaigns" to tackle high-priority issues such as anti-corruption and pollution control. These efforts involve multiple, prolonged waves of surprise inspections by central teams to local areas, enhancing their reach and duration (Manion 2016; Shen, Wang, and Zhang 2023). Unlike typical ad hoc efforts, these regularized campaigns have demonstrated sustained effectiveness in reducing policy evasion and ensuring compliance with environmental standards. Their sustained efficacy partly stems from the severe consequences of noncompliance. For example, the initial wave of central environmental inspection campaigns led to the penalization of 29,000 enterprises, accumulating fines totaling approximately USD \$224 million. Additionally, 1,527 individuals were detained and 18,448 government and party leaders were interviewed, with 18,199 held accountable for their actions (China News 2018).

Whereas past efforts focused on pollution control, regularized campaigns have the potential to significantly improve reported carbon-data integrity in China—the foundation for a functional carbon ETS. The ETS is considered one of the most cost-effective solutions for carbon-emissions reduction. In July 2021, China launched its national ETS, which is expected to be the primary tool to achieve its "dual carbon" goals of reaching peak carbon emissions by 2030 and carbon neutrality by 2060. Despite progress, a key obstacle has been a lack of data integrity. The Ministry of Environment and Ecology established a "central-provincial-municipal" three-level mechanism to review monthly carbon-emissions data submitted by firms, which involves screening by the central government, technical review by the provincial government, and on-site inspections by the prefectural government. Issues arise when subnational governments contract out their responsibilities to other agencies and firms. Contracting and subcontracting, although legally allowed, further complicated the principal-agent problem. It has been reported that the contracted services knowingly participated in data fabrication or only superficially examined submitted data and materials without verifying their authenticity, completeness, and accuracy (Ministry of Ecology and the Environment 2022). This situation echoes past challenges in China, where environmental protection bureaus were influenced by special interests (Shen 2022; Shen, Wang, and Zhang 2023). For instance, that influence led to less stringent enforcement of standards, particularly at higher-contributing industrial firms, which resulted in more violations but fewer punishments—a situation that persisted until the central government initiated regularized campaigns to curb pollution (Shen, Wang, and Zhang 2023). Similarly, the central government could employ regularized campaigns to enhance monitoring and verification of carbon data, in addition to pollutant emissions data, in localities.

POLICY OUTCOMES

Ultimately, mere implementation is insufficient; implementation efforts must translate effectively into policy outcomes. Achieving policy outcomes presents challenges for both democracies and autocracies, particularly when addressing complex policy issues. The Paris Agreement established a long-term goal to maintain the increase in average global surface temperature within this century to well below 2 degrees Celsius above the preindustrial level and to continue efforts to further restrict the temperature increase to 1.5 degrees Celsius. Achieving this goal necessitates a drastic reduction in carbon emissions from major emitting sectors, including industry, transportation, and power.

However, abatement efforts do not uniformly translate across different sectors: some sectors are inherently more complex and can be significantly more challenging to abate than other sectors. Notably, the cement, iron and steel, and chemicals industries—which are responsible for approximately 20% of global carbon emissions—pose significant challenges due to emissions originating from the processes themselves, in addition to those related to energy use (International Energy Agency 2020). These industries typically rely on high-temperature process heat, which is a strength of fossil fuels.

Achieving deep decarbonization of these hard-to-abate industries and sectors depends on possessing the necessary knowledge and technical know-how, making the technological innovations cost-effective and competitive, and deploying them at scale, which are more directly related to a country's level of development rather than its regime type. For instance, green hydrogen—a rising innovation expected to become competitive by mid-century—and concentrated solar power could provide the high-temperature process heat required for the cement, iron and steel, and chemicals industries. The ability to apply technical expertise for deep decarbonization and have supportive regulatory frameworks to scale the innovation is not inherently tied to a country's regime type. Developed countries currently

are leading, although developing countries—especially China—are catching up.

CONCLUSION

In conclusion, the notion of “authoritarian advantages” in climate mitigation warrants careful consideration, with the comparative advantage depending on the stage of the policy process. As outlined in table 1, this study contends that authoritarian countries focused on climate issues and guided by scientific evidence may exhibit greater efficiency in generating policy outputs compared to their democratic counterparts. However, it is essential to recognize that even with sufficient state capacity and monitoring infrastructure, the successful large-scale implementation of these policies may present unique challenges for autocracies, particularly when grappling with significant informational gaps related to local enforcement of rules and standards. Nonetheless, autocracies can leverage their coercive ability to swiftly mobilize resources for regularized implementation campaigns. These campaigns, as observed in the enforcement of pollutant-emissions standards, have proven to be effective and enduring in ensuring compliance despite the high costs incurred by both enforcers and their targets. Finally, the successful translation of implementation into outcomes hinges on having and applying the necessary knowledge, technical expertise, and supportive regulatory frameworks. The challenge is not inherently tied to regime type and varies across industries and sectors.

The commitment of a country to prioritize climate change, its level of state capacity, the functionality of its MRV systems, and the availability of knowledge and technologies to abate hard-to-abate industries are interconnected and closely linked to its developmental stage. Although political science often emphasizes the dichotomy between democracies and autocracies, there is potential to broaden this perspective. By considering the broader impacts of a country's developmental level, political scientists can gain deeper insights into climate politics globally.

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Table 1

Comparative Advantages of Authoritarian versus Democratic Regimes in Climate Mitigation

Stage of the Policy Process	Autocracies (Compared to Democracies)	Preconditions
Output	More effective	National leadership must view climate change as a high-priority policy issue. Climate policies are made based on science.
Implementation	Less effective if unable to overcome more significant informational challenges	There is sufficient local state capacity to implement. A reliable, standardized, and unified MRV system at the monitored-unit level is in place.
Outcome	Not directly relevant	It requires having and applying the necessary knowledge and technical expertise and having supportive regulatory frameworks to translate efforts into outcomes, especially concerning the hard-to-abate industries and sectors.

DATA AVAILABILITY STATEMENT

Research documentation and data that support the findings of this study are openly available at the *PS: Political Science & Politics* Harvard Dataverse at <https://doi.org/10.7910/DVN/NEPEWK>.

CONFLICTS OF INTEREST

The author declares that there are no ethical issues or conflicts of interest in this research. ■

NOTES

1. This is not to suggest that entities such as NGOs and citizens are irrelevant to climate policies in authoritarian regimes. Rather, they tend to have a lesser impact compared to their counterparts in democracies and generally are not the principal actors in climate action or obstruction (Shen, Cain, and Hui 2019).
2. This article uses the terms “autocracies” and “authoritarian regimes” interchangeably. Both refer to systems characterized by centralized control and significant limitations on political freedoms. In these systems, ruling power may reside in a single individual, a small group, or a dominant political party. While some authoritarian regimes are governed by a single party, others may permit multiple parties but maintain control through manipulation and repression. As a result, partisan politics, including those related to climate change, are significantly more constrained in authoritarian regimes than in democracies, leading to fewer political obstacles in enacting climate policies.
3. This article uses the Democracy Index from the Economist Intelligence Unit. The Index evaluates countries based on various indicators of political freedom and civil liberties, assigning scores that reflect their degree of democracy. Despite annual recalibrations of these scores, a minimum of 50 countries are consistently identified as authoritarian. The “Statistical Review of World Energy” (Energy Institute 2023) provides annual data on CO₂e emissions from energy, process emissions, methane, and flaring at the country level for 13 of these authoritarian states (see figure 1). Consequently, the total contribution to global CO₂e emissions by authoritarian countries, therefore, would be even higher.
4. Climate policy revolves around three crucial pillars: (1) climate mitigation, involving the reduction of carbon emissions; (2) climate adaptation, encompassing adjustments to actual or expected climate conditions and their impacts; and (3) loss and damage, addressing the residual destructive effects of climate change that mitigation and adaptation have been unable to prevent or address. This study emphasizes the first pillar because it is within this realm that the majority of discussions and debates regarding regime type and its capacity to address the climate challenge have taken place.
5. An important question arises regarding whether democracies’ command and control and regulation of everyday life in the face of crises should be viewed as “authoritarian.” Moreover, does the answer vary depending on the duration of state intervention? For instance, wartime mobilization and global pandemics typically are temporary, whereas addressing climate change and reversing the degradation of life-sustaining ecosystems are long-term challenges requiring sustained efforts. Some scholars would reasonably assert that such interventions bear authoritarian characteristics regardless of duration. However, depending on our ideological and normative values, we also might argue reasonably that these state actions are not authoritarian because they aim to protect society and align with democratic principles. It also is plausible to argue that crises such as climate change demand urgency without constituting emergencies. Therefore, long-term, authoritarian-style governance in response to these urgent matters could be perceived as a “new normal” in democratic societies.

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