Divergent Decarbonization: Great Power Competition and the Coming Climate Transition

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Abstract

Donald Trump's return to office has triggered widespread alarm about the future of global climate ambition. We argue US climate retrenchment is likely to reinforce pre-existing trends of divergent decarbonization. While US climate policy remains fragmented and vulnerable to partisan reversal, China has steadily expanded its leadership in green manufacturing, innovation, and critical mineral supply chains. Using an event study of stock market reactions to the 2024 election, we show Trump's victory negatively impacted US green firms while enhancing valuations of Chinese competitors. Moreover, divergent decarbonization has far-reaching implications for great power competition: China's dominance in low-carbon technologies is reshaping patterns of trade dependence, enhancing its capacity to provide green public goods, and bolstering its legitimacy as a global leader. We discuss core debates about what China's rise means for the stability, character, and legitimacy of international order and describe how divergent decarbonization is likely to shape each dimension.

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1 Introduction

In his 2024 re-election campaign, Donald Trump took aim at his predecessor's climate policies: he promised to repeal the landmark Inflation Reduction Act, campaigned on new federal support for fossil fuel extraction, and lambasted the left's green industrial policies as a "Green New Scam" (Tankersley, 2023; Reuters, 2024). Now in office again, he has been quick to follow through on these threats. Within his first months, the administration moved to halt implementation of key provisions of the Inflation Reduction Act (IRA), including delays to clean energy tax credits and reversals of federal procurement guidelines for low-carbon technologies. The US also formally withdrew from international climate finance commitments and suspended participation in global climate forums, signaling a broader retreat from multilateral climate engagement (Chu et al., 2025; Shah, 2025; Stevenson, 2025). This retrenchment of US climate policy is part and parcel of a broader shift in US orientation, away from its historical support of the post-war liberal international order and towards an isolationist, transactional, and reactionary approach to international politics (Sandbu, 2025).

These events have led to much alarm in climate policy circles about whether other countries are likely to follow suit, resulting in a global retreat from decarbonization policies and climate ambition.[1] We argue this is unlikely: rather, US retrenchment from climate policy is more likely to reinforce pre-existing trends in countries' decarbonization trajectories. While US climate policy has been consistently inconsistent – marked by high-profile legislative failures and compromises – China's commitment to decarbonization has steadily gathered speed since 2006 when it overtook the US as the world's largest greenhouse gas emitter.[2] Since then Chinese state investments in green manufacturing and in research and development have re-shaped the global green economy and subsi-

[1] See for example US Alliance for International Leadership (2025); Center for Global Sustainability (2025); Ettinger and Collins (2023).

[2] See Netherlands Environmental Assessment Agency (2007).

dized decarbonization efforts around the world. Where the Trump administration has committed itself to increasing fossil fuel extraction across the US, China's greenhouse gas emissions are on track to peak by decade's end (Linster and Yang, 2018; Zhang et al., 2024). Rather than ushering in an era of global climate retrenchment, President Trump's election is likely to irreversibly cement these emerging trends, resulting in what we refer to as divergent decarbonization.

The divergence of US and Chinese approaches to decarbonization, along with Trump's electoral victory, are taking place against a backdrop of slow-moving, but inexorable structural changes within the international system. The most important of these is the oft-referenced rise of China: as China's economy grows – lifting millions of its population out of extreme poverty – it will eventually overtake the United States in both economic size and material resources. Parallel investments in China's military capacity suggest that it may also soon be able – or at least willing – to challenge long-standing US military dominance within the Asia Pacific. This transformation of capabilities within the international system is likely to usher in a new era of world politics, one marked by a resurgence of great power competition and – for the first time in modern history – a hegemonic challenger that hails from Global South rather than Global North (Matheswaran, 2021; Gill, 2022).

For nearly twenty years scholars have debated what the rise of China is likely to mean for the character and longevity of the current international order (Ikenberry, 2011; Acharya, 2018; Lind, 2024). In this note, we argue that US climate retrenchment under the Trump administration – and the resulting divergence in US and China decarbonization trajectories – is poised to play an outsized role in the two countries' struggle for influence. We structure our discussion below around three central questions which have pre-occupied scholars of international order: 1) How will third parties respond to US-China competition for geostrategic influence? 2) How will the rise of China alter the character of the liberal international order? And 3) how will a shift in global power from industrialized countries to an emerging market economy shape the legitimacy and power of international order

moving forward?

Divergent decarbonization – accelerated by Trump's abrupt climate retrenchment – will shape the answers to each of these questions. China's expanding dominance of global green supply chains promises to provide it with a unique source of geostrategic leverage, particularly among trade partners in the global south. China's provision of green public goods – driven by its own state-led development policies – suggests a very different view of international order, one rooted in dirigiste, development oriented cooperation between states, rather than one which emphasizes free-trade and limitations on policy space. And finally China's leadership and support for a low-carbon economy promises to provide a new source of legitimacy to the rising power, especially when compared with the serial failures of Western powers to make meaningful progress on their own decarbonization commitments.

In the next sections we describe how the 2024 election of Donald Trump has reified patterns of divergent decarbonization and what this means for hegemonic competition between China and the US.

2 Divergent Approaches to Decarbonization

Trump's election came at a delicate moment for the global climate transition. After decades of policy setbacks, the Biden administration succeeded in passing landmark climate legislation, aimed at putting the US on an even footing with China in the green transition. The unfortunately-named Inflation Reduction Act included $369 billion in federal funding for clean energy investment, low carbon transportation, and next generation research and development of low carbon fuels, grid-scale battery storage, and carbon capture and sequestration. Funding from the IRA dwarfed equivalent measures globally. It was designed to single-handedly place the US on track to meet its international climate commitments while catching up to long-standing Chinese investments in green

manufacturing (World Economic Forum, 2023).

In the wake of his promises to withdraw from the Paris Agreement and to repeal the IRA, Trump's election win dealt a devastating blow to US green manufacturing and climate ambition. Yet US retrenchment does not necessarily imply a global retrenchment of climate policy. Instead, we argue that the US retreat from climate action simply reifies a growing divergence in countries' approaches to decarbonization: where US climate action has been consistently inconsistent since the early days of the climate regime, Chinese state investments have consistently and increasingly shaped the frontier of what is possible in terms of global decarbonization. Trump is unlikely to eliminate this divergence; rather it is likely to make the differences between these two regimes and their approach to climate policy all the more permanent (Harvey, 2025; Zhang, 2025; Sanderson, 2025).

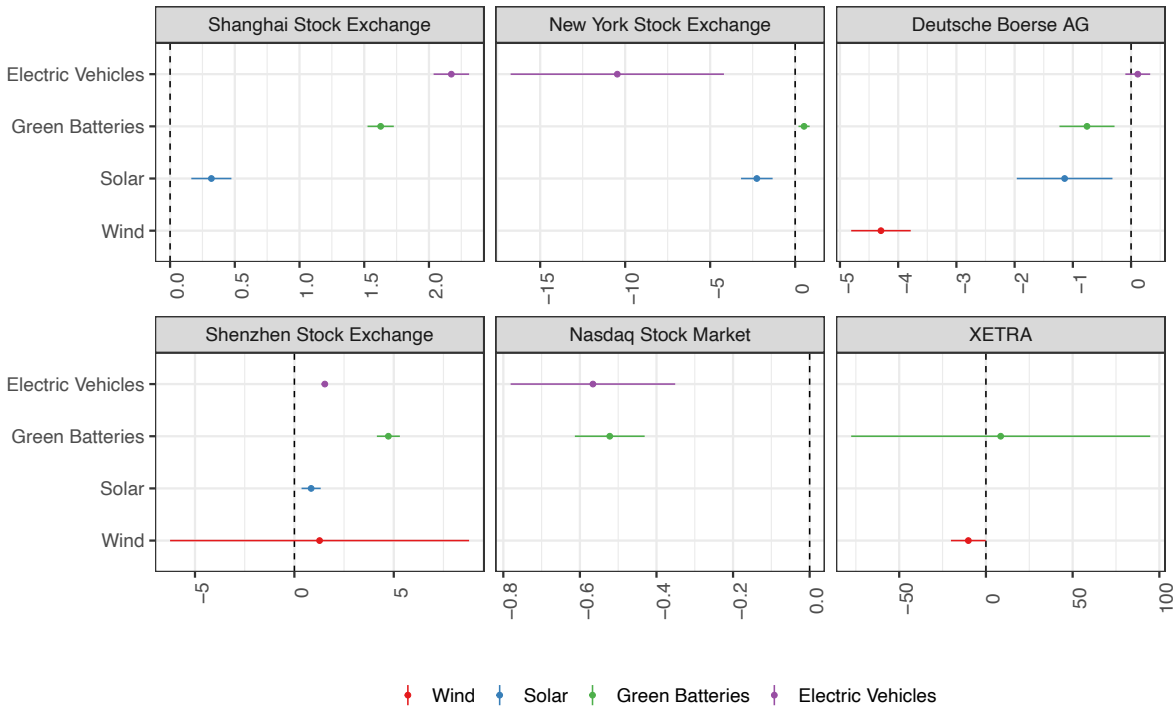

Figure 1: Election Induced Abnormal Returns to Green Firms

The financial performance of green firms in the aftermath of Trump's election supports the likelihood of divergence in climate policies rather than a global retreat. To show this

we employ an event study framework to estimate abnormal returns of all publicly-traded firms engaged in green manufacturing – solar, wind, electric vehicles, and lithium ion batteries – following the US election on November 5, 2024. Abnormal returns to firm stock prices are a widely-employed metric of how new information affects investor perceptions of future profits (Kothari and Warner, 2008). If Trump's win and the implied retrenchment of US climate policy indicates a broader, global retreat from climate action then we should observe negative abnormal returns to green firms across the board. If however the electoral outcome indicates diverging paths of decarbonization then we should observe negative returns to US green firms, but positive returns to Chinese firms reflecting gains vis-à-vis US competitors.

Figure 1 depicts the results of our event study analysis.[3] We aggregate abnormal returns within industries to the exchange level, enabling us to compare how green firms traded on Chinese exchanges compare with their US – and European – counterparts. Across the board Chinese renewable firms gain in value following Donald Trump's election reflecting expectations of renewed growth and profitability. In contrast, US firms generally have negative abnormal returns reflecting expected losses to firm profitability. Somewhat surprisingly, the returns of German firms are also largely negative or insignificant suggesting either expectations of retrenchment among these US allies in the wake of Trump's election or at least greater vulnerability of German manufacturers to the US market. Overall, counter to popular expectations, our results suggest that China's green industries are likely to thrive in an era of US climate retrenchment.

[3]Methodological details can be found in the appendix. Table A-1 in the Appendix lists the data sources for all figures and analysis.

3 Implications for World Order

Next we discuss implications of China's green dominance in the context of US-China rivalry and the long-term structural changes under way in the international system. We focus our discussion around three questions which have occupied the literature on great power transition over the last twenty years: What does the rise of China mean for global patterns of conflict and cooperation? What does the rise of China mean for the provision of public goods in the global economy? And what does the rise of China mean for the legitimacy and persistence of the Western-led liberal international order? We argue that the patterns of decarbonization and retrenchment discussed above have the potential to shape the outcome to each of these questions in significant ways.

3.1 Coercion and the Balance of Power

How will China's dominance in green supply chains shape its long-term diplomatic and geopolitical influence? Figure 2 maps trade flows between key exporters (left) and importers (right). China enjoys clear dominance of all categories with two exceptions: electric vehicles in which its exporters' market share is roughly equal with that of German firms and polysilicon – an upstream component of solar panels – the manufacture of which remains dominated by Germany and the US (Nahm, 2021; Nemet, 2019b). Notably, while China generally relies on imports of polysilicon for its downstream production, the vast majority of these components are imported from Germany and other nations, rather than from the United States. Thus China not only dominates across sectors of green manufacturing but it is also relatively insulated from reliance on US upstream component suppliers.

China's dominance of green supply chains is particularly apparent in its dominance of emerging markets where it out-competes exports from the US and Germany across nearly every relevant product category. Figure 3 depicts the relative shares of US, German,

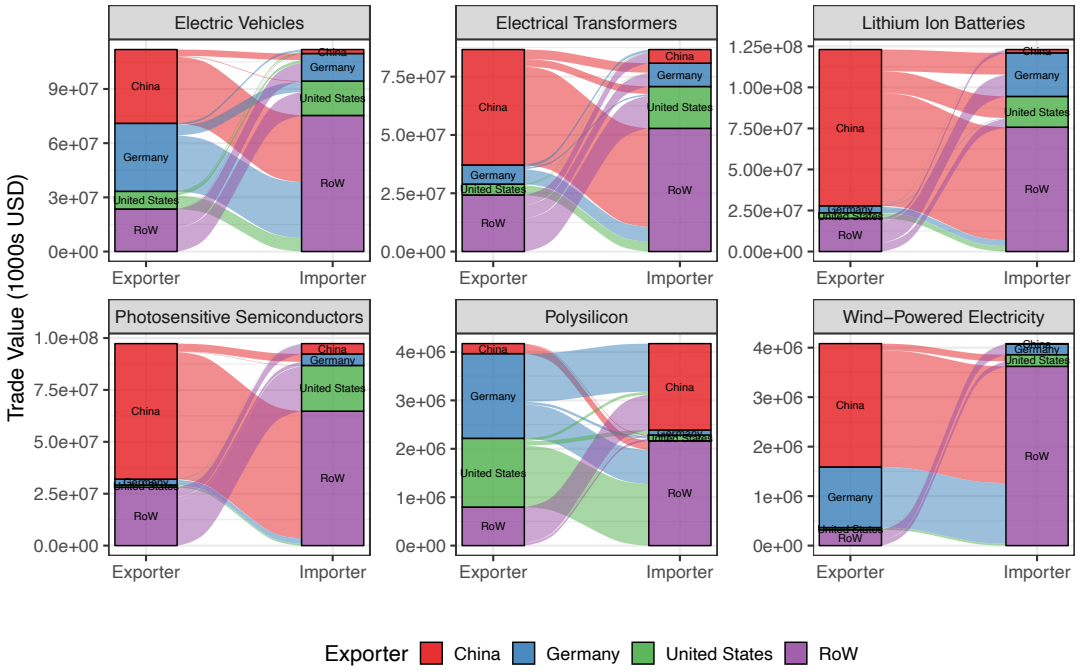

Figure 2: Trade Flows of Green Products, 2023

and Chinese exports of photosensitive semiconductors, a key component of solar panel manufacturing. In the map green indicates German exports, blue indicates US exports, and red indicates Chinese exports. Across the board, Chinese dominates the global export market, though this dominance is particularly pronounced across the global south.[4]

This trade in green goods represents only a small portion of global commerce to date. However, projections indicate that there is substantial scope for growth over the coming century. In 2022, green trade reached 1.9 trillion USD, growing 4% year on year despite overall stagnation in the broader value of international trade. China's international trade in green goods with members of the Regional Comprehensive Economic Partnership (RCEP) grew from $0.37 billion to $4.4 billion between 2001 and 2020 with an additional four-fold increase expected in global green trade by the end of the decade (UNCTAD, 2023b; Yang et al., 2023; UNCTAD, 2023a).

[4]Similar figures depicting global export shares for other green technologies are included in Appendix Figures A-1 through A-6.

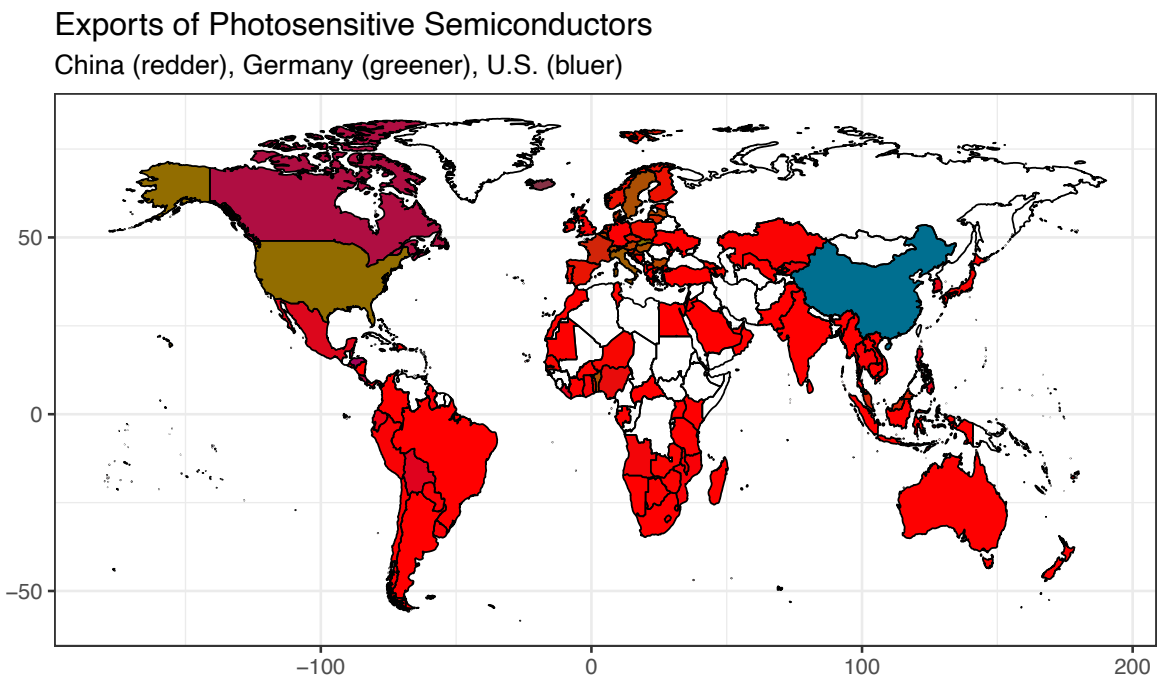

Figure 3: Exports of Photosensitive Semiconductors from China, Germany, and the US, 2023

As trade in green goods expands, China's dominance of low-carbon supply chains promises a corresponding increase in its coercive capacity vis-à-vis green trading partners. Asymmetric dependence on international trade has long been recognized as as a source of coercive leverage in the international system. States on whom trade partners disproportionately rely can threaten to withhold goods and resources or offer to provide the same goods and resources on concessional terms in order to incentivize cooperation. Green goods represent just one area of the global economy in which China holds a significant advantage relative to its trade partners and relative to potential competitors – most notably the US – alike; yet as the magnitude of green goods grows the strategic value of China's investments in this decarbonization will expand in kind (Keohane and Nye, 1977; Farrell and Newman, 2019).

In addition to their projected growth, trade in green goods is strategically valuable for China due to the particular salience of trade in the context of national energy systems

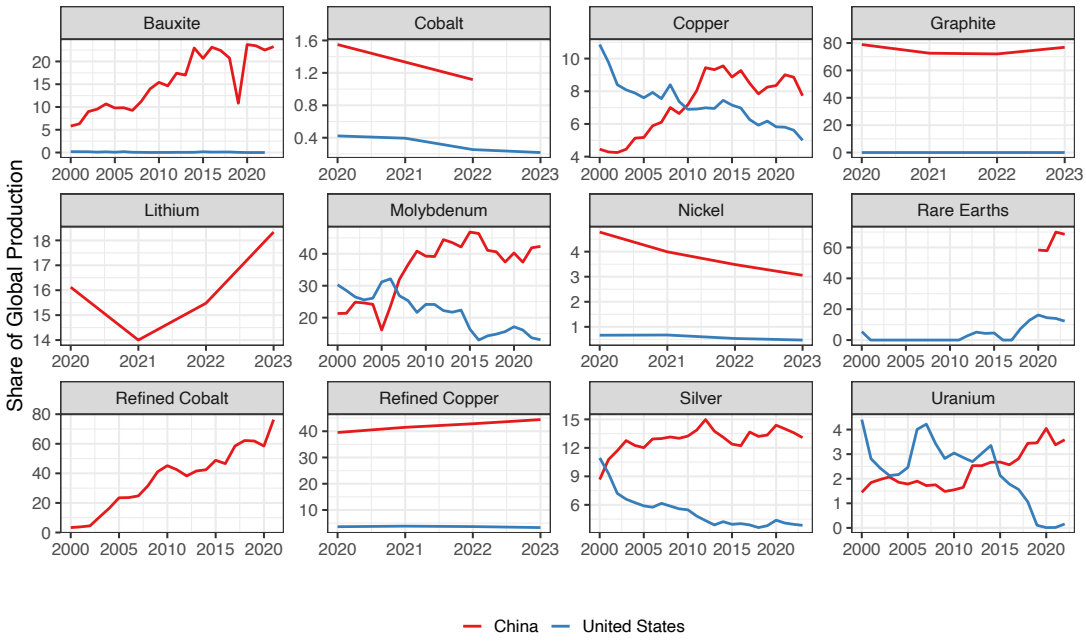

Figure 4: Production of Critical Minerals, 2000-2025

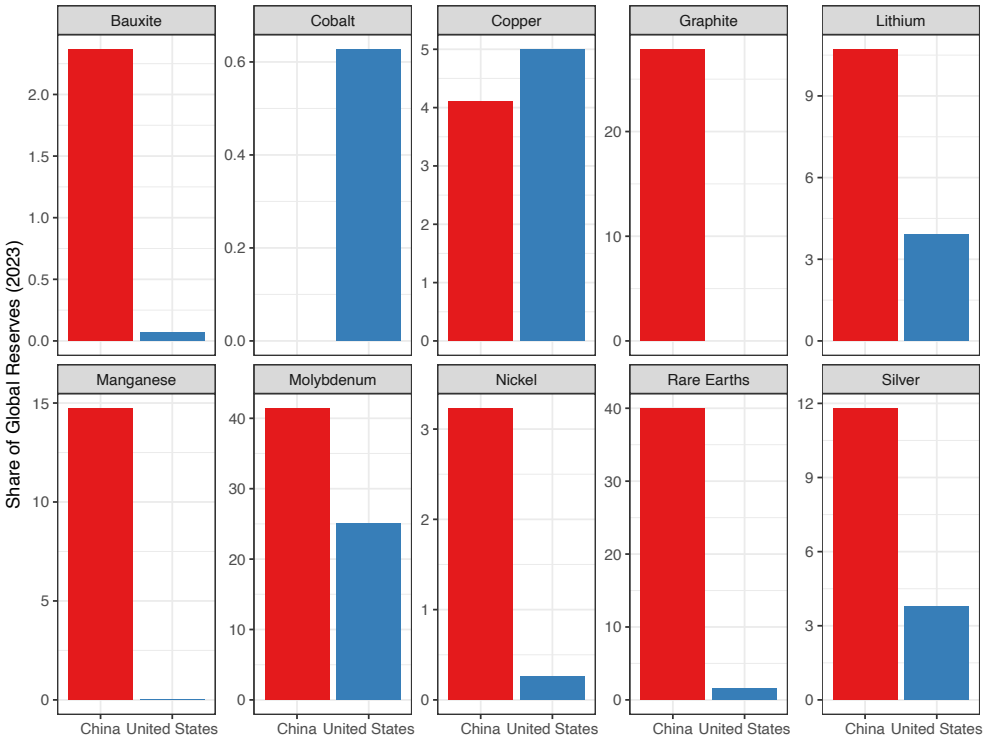

Figure 5: Global Reserves of Critical Minerals, 2023

which are necessary to power economic growth and promote macroeconomic stability. Historically trade in fossil fuels including oil and natural gas has had profound impacts on the distribution of geopolitical power and has led to the emergence and cultivation of energy diplomacy and energy policy as significant vectors of political influence. As states transition to low-carbon energy systems, control of green supply chains – not only dominance of low-carbon technology, but also the global supply of critical minerals – is likely to take on renewed strategic significance (Overland et al., 2021; Goldthau and Witte, 2011).

Here too China already has a significant relative to the United States and its Western allies. While deposits of critical minerals are globally dispersed, China dominates global supply chains due to its significant and unparalleled investments in refinement, processing, and export (Goldman Sachs Research, 2023; World Economic Forum, 2024). Figure 4 depicts trends in the production of key critical minerals by China versus the US over the last twenty-five years. Figure 5 depicts reserves of these same minerals by country. As in the case of green manufacturing, China dominates both production and reserves of nearly every mineral considered (SIPRI, 2024).

Whether China's rise and eventual overtake of the United States in economic – and potentially military – terms results in open conflict or a more peaceful, negotiated transition, China's dominance in green manufacturing and the processing of critical minerals will play an important and growing role in shaping its strategic position.

3.2 The Character of International Order

Hegemonic rule within the international system has long been associated with the provision of public goods. In Kindleberger (1973)'s classic analysis, it was the absence of a global hegemon willing to provide a backstop to global markets that led to the chaos of the Great Depression. Hegemonic states support stability and order in the international

system through the provision of public goods from which other states benefit, but which they are themselves unwilling to provide. Traditionally these public goods have included: support for open markets, stable currency systems, and a commitment to rules-based global governance (Krasner, 1976; Keohane, 1984). Yet this particular approach to public goods provision may well reflect the character of the hegemon rather than any universal logic of hegemonic rule. Both recent examples of hegemonic provision of public goods – first the United Kingdom and later the Unites States – share a distinct commitment to the principles of free markets, democratic governance, and a rules-based order (Ikenberry, 2001).

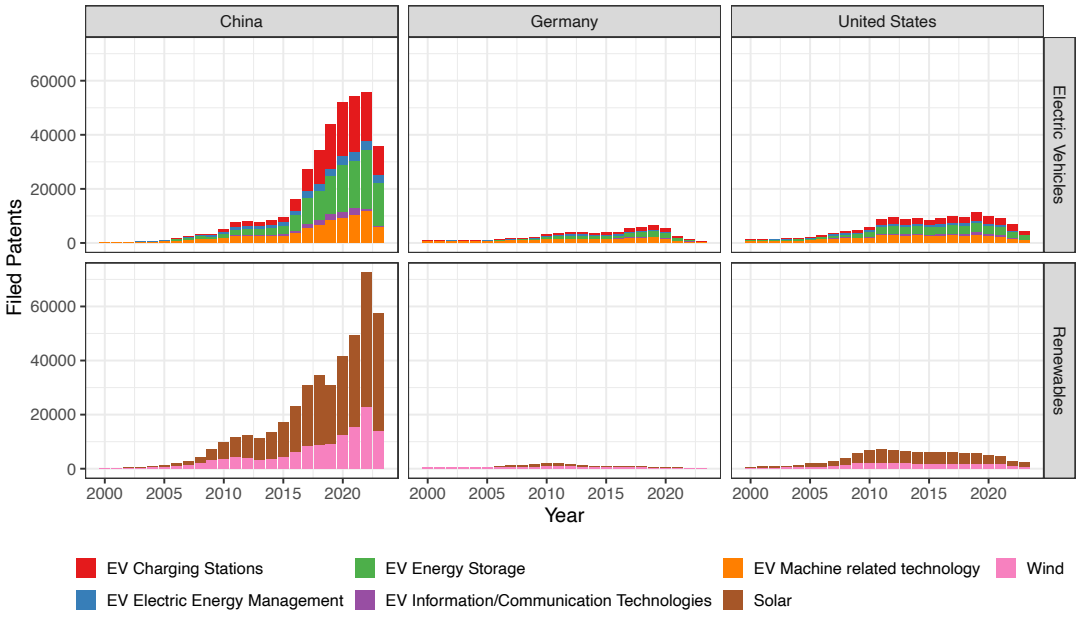

Figure 6: Patents of Key Green Technologies, 2000-2025

In contrast, China's approach to public goods – and therefore its approach to order in the international system – may differ markedly from that of the Western powers (Acharya, 2018). Chinese investments in research and development, supply and demand-side stimuli, and in forward-looking climate policies are already re-shaping the global energy transition and will continue to impact decarbonization efforts for decades to come. Figure 6 depicts a measure of green innovation over the last twenty-five years: the number of patents filed

related to key green technologies by country. Beginning around the mid-2000s, Chinese patent applications dramatically outpace those of either the US or Germany across nearly all sub-sectors. This R&D activity reflects in large part financial commitments from the Chinese state itself. Figure 7 depicts Chinese state subsidies for renewable energy and electric vehicles from 2020-2024 and compares these with those of the United States, including funds allocated under the IRA. Both of these critical green technologies benefit tremendously from Chinese state support. These subsidies not only serve Chinese domestic interests, but also function to make green industries commercially viable at a global scale. Further, it shows how the prospect of an IRA repeal could further exacerbate Chinese leadership in green investment and subsequent public goods provision.

This provision of public goods is especially salient to decarbonization efforts given the multiple, interrelated market failures which characterize the challenge of global climate change. These include not only the failure to internalize the social costs of carbon emissions but also under-investment into research and development and various coordination failures during the early stages of technological deployment (Popp, 2013; Greenstone, 2024). In both cases, consistent support from the state is needed to overcome barriers to decarbonization. China's commitment to providing this state-sponsored support has had transformative effects on the global climate transition, most notably in driving down the costs of renewable energy technologies by nearly 99% since the late 1970s and also in accelerating the global adoption of electric vehicles (Nemet, 2019a; Fletcher, 2011).

Rather than a commitment to free trade and a rules-based international order then, China's approach to public goods provision may reflect instead its commitments to dirigiste economic governance and to providing the enabling conditions for poverty alleviation via rapid economic development.

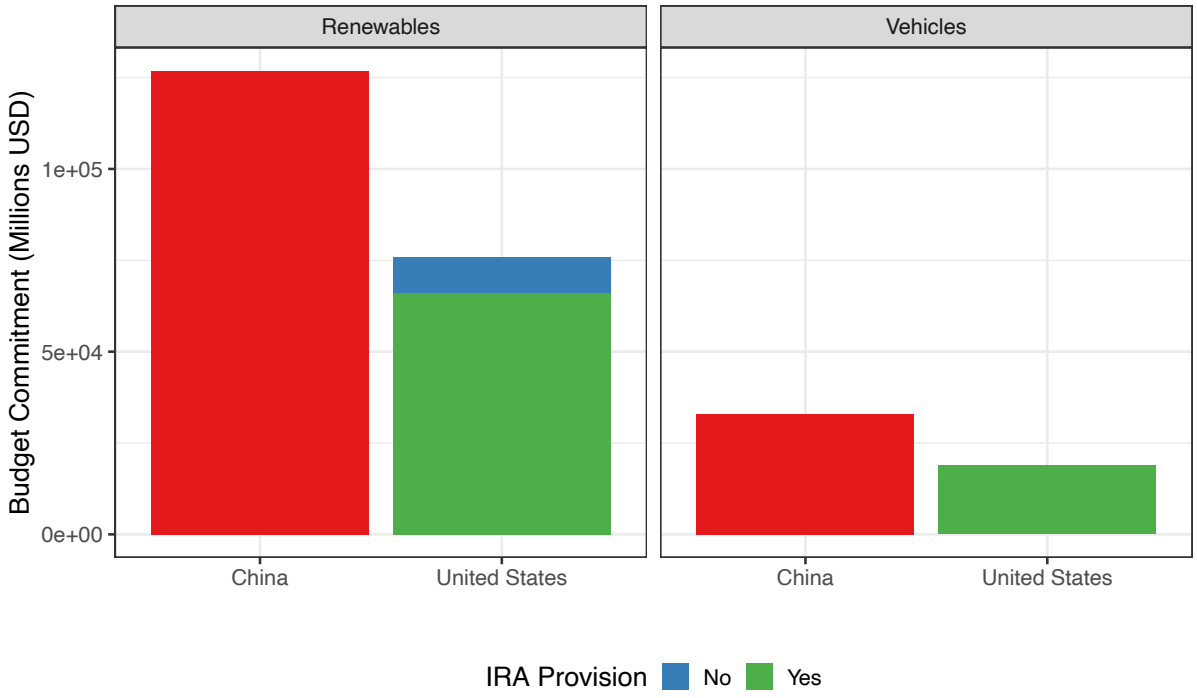

Figure 7: Budget Commitments for Renewables and Low-Carbon Vehicles, 2020-2024

3.3 Legitimacy and Consent

The final dimension of divergent decarbonization we consider is its implications for legitimacy and consent-based order in the international system. Theorists of the postwar international order argue that the US-led, rules-based international system represents an innovation in international politics: rather than imposing order via coercion and force alone, the US system represents a compromise. The hegemon voluntarily agrees to be bound by rules and institutions of its own making in exchange for the consent and cooperation of other states in the system (Ikenberry, 2011; Stone, 2011). Some argue that the consensual nature of the liberal international order make it likely that its institutions will persist even after the rise of China and the decline of the US. Yet others critique this view, both of the likely persistence of the current international order and also the normative basis of legitimacy and consensual rule. Yan (2019) and other Chinese scholars

have outlined a view of legitimacy based on political leadership and "moral realism." In this view, China is likely to support the emergence of a very different international order, one rooted in alternative notions of leadership, consent, and legitimacy.

Against this backdrop, China's leadership in the area of decarbonization may have special significance and power among other countries of the global south. As the impacts of global warming are increasingly felt by citizens around the world, the failure of Western nations – particularly the United States – to live up to its own international treaty commitments and the rules of its own making may lead to growing disillusionment with the liberal international order. In contrast, China's consistent investments in green manufacturing and its provision of green public goods are already serving to burnish its credentials as a principled emerging power, enhancing its own legitimacy and approach to international order (Karlsson et al., 2012; Hurrell and Sengupta, 2023).

4 Conclusion

Donald Trump's return to office has revived fears of global backsliding on climate cooperation. Yet rather than triggering a collapse of ambition, US retrenchment is likely to re-instate and reinforce pre-existing divergence in global patterns of decarbonization. While US climate policy remains fragmented and reversible; China's has grown more consistent, strategic, and consequential. Through sustained investments in green manufacturing, R&D, and critical minerals, China is remaking the material and technological foundations of the energy transition. These developments carry systemic implications. As global demand for low-carbon technologies expands, China's control over key supply chains strengthens its geopolitical leverage, enhances its capacity to provide global public goods, and legitimizes an alternative vision of international order. Renewed US obstructionism is likely to reinforce rather than counter this shift.

References

Amitav Acharya. *Constructing Global Order: Agency and Change in World Politics*. Cambridge University Press, Cambridge, 2018.

Center for Global Sustainability. Advancing u.s. climate action under federal policy rollbacks. Technical report, America Is All In, February 2025.

Amanda Chu, Jamie Smyth, et al. Inside trump's first strikes at biden's climate legacy. *Financial Times*, 2025.

Aaron Ettinger and Andrea M. Collins. Trumpism and the rejection of global climate governance. *International Political Science Review*, 44(5):789–808, 2023.

Henry Farrell and Abraham L Newman. Weaponized interdependence: How global economic networks shape state coercion. *International security*, 44(1):42–79, 2019.

Seth Fletcher. *Bottled Lightning: Superbatteries, Electric Cars, and the New Lithium Economy*. Hill and Wang, New York, 2011. ISBN 9780809030538.

Bates Gill. Meeting china's military challenge: Collective responses of u.s. allies and partners. Technical report, National Bureau of Asian Research, 2022.

Goldman Sachs Research. Resource realism: The geopolitics of critical mineral supply chains, 2023. URL https://www.goldmansachs.com/insights/articles/resource-realism-the-geopolitics-of-critical-mineral-supply-chains.

Andreas Goldthau and Jan Martin Witte. Back to the future or forward to the past? strengthening the international energy regime. *Global Policy*, 2(2):193–204, 2011. doi: 10.1111/j.1758-5899.2011.00129.x. URL https://onlinelibrary.wiley.com/doi/full/10.1111/j.1758-5899.2011.00129.x.

Michael Greenstone. The economics of the global energy challenge. Distinguished Lecture, American Economic Association Annual Meeting, 2024.

Fiona Harvey. "backsliding": most countries to miss vital climate deadline as cop30 nears. *The Guardian*, Feb 2025. URL https://www.theguardian.com/environment/2025/feb/08/countries-miss-climate-deadline-cop30-trump-pollution.

Andrew Hurrell and Somini Sengupta. Climate leadership beyond the global north. Policy analysis/working paper, 2023.

G. John Ikenberry. *After Victory: Institutions, Strategic Restraint, and the Rebuilding of Order After Major Wars*. Princeton University Press, Princeton, NJ, 2001.

G. John Ikenberry. *Liberal Leviathan: The Origins, Crisis, and Transformation of the American World Order*. Princeton University Press, Princeton, NJ, 2011.

Christer Karlsson, Charles Parker, Mattias Hjerpe, and Björn-Ola Linnér. Looking for leaders: Perceptions of climate change leadership among climate negotiation participants. *International Negotiation*, 17(1):93–113, 2012.

Robert O. Keohane. *After Hegemony: Cooperation and Discord in the World Political Economy*. Princeton University Press, Princeton, NJ, 1984.

Robert O. Keohane and Joseph S. Nye. *Power and Interdependence: World Politics in Transition*. Little, Brown, Boston, 1977. ISBN 0316489352.

Charles P. Kindleberger. *The World in Depression, 1929–1939*. University of California Press, Berkeley, 1973.

S. P. Kothari and J. B. Warner. Econometrics of event studies. In B. E. Eckbo, editor, *Handbook of Corporate Finance: Empirical Corporate Finance*, pages 3–36. Elsevier / North-Holland, 2008.

Stephen D. Krasner. State power and the structure of international trade. *World Politics*, 28(3):317–347, 1976. doi: 10.2307/2009974. URL https://www.jstor.org/stable/2009974.

Jennifer Lind. Back to bipolarity: How china's rise transformed the balance of power. *International Security*, 49(2):7–38, 2024.

Max Linster and Chun Yang. China's progress towards green growth: an international perspective. Technical Report 2018/05, OECD Green Growth Papers, 2018.

M Matheswaran. Us-china strategic competition in the asia-pacific. Technical report, Trends Research Institute, 2021.

Jonas Nahm. *Collaborative Advantage: Forging Green Industries in the New Global Economy*. Oxford University Press, Oxford, UK, 2021. ISBN 9780197555361.

Gregory F Nemet. *How solar energy became cheap: A model for low-carbon innovation*. Routledge, 2019a.

Gregory F. Nemet. *How Solar Energy Became Cheap: A Model for Low-Carbon Innovation*. Routledge, New York, 2019b. ISBN 9780367136598.

Netherlands Environmental Assessment Agency. China overtakes us as top co emitter. Reuters, 2007.

Indra Overland, Roman Vakulchuk, and Arild Moe. The geopolitics of renewable energy: Debunking four emerging myths. *Global Environmental Change*, 69:102292, 2021. doi: 10.1016/j.gloenvcha.2021.102292. URL https://www.sciencedirect.com/science/article/pii/S0959378021000757.

David Popp. Innovation and climate policy. Working Paper 15673, National Bureau of Economic Research, 2013.

Reuters. Trump has dismissed president joe biden's policies to fight climate change as a "green new scam". *Reuters*, Jul 2024.

Martin Sandbu. Preparing for a post-american world (part 1). *Financial Times*, 2025.

Henry Sanderson. China is winning the race for green supremacy. *Financial Times*, Jan 2025. URL https://www.ft.com/content/d3650b44-0313-44c9-a7aa-495549b158b5.

Simmone Shah. How trump is trying to undo the inflation reduction act. *Time*, 2025.

SIPRI. Critical minerals and great power competition, 2024. URL https://www.sipri.org/sites/default/files/2024-10/critical_minerals.pdf.

Ian M. Stevenson. Trump energy adviser slams renewables, says focus is on fossil fuels. *Politico*, 2025.

Randall W. Stone. *Controlling Institutions: International Organizations and the Global Economy*. Cambridge University Press, Cambridge, UK, 2011. ISBN 978-1-107-00540-2.

Jim Tankersley. Trump's climate plan: Drill, build, and dismantle biden's legacy. *The New York Times*, 2023.

UNCTAD. Global trade in green technologies to quadruple by 2030, Mar 2023a. URL https://unctad.org/press-material/global-trade-green-technologies-quadruple-2030.

UNCTAD. Global trade slows, but green goods grow, Mar 2023b. URL https://unctad.org/news/global-trade-slows-green-goods-grow.

US Alliance for International Leadership. Implications of the trump presidency for global climate action. Technical report, USALI, 2025.

World Economic Forum. The inflation reduction act's global impact: clean energy boom in the u.s. Technical report, World Economic Forum, 2023.

World Economic Forum. Energy transition and geopolitics: Are critical minerals the new oil?, April 2024. URL https://www.weforum.org/publications/energy-transition-and-geopolitics-are-critical-minerals-the-new-oil/.

Xuetong Yan. *Leadership and the Rise of Great Powers*. Princeton University Press, Princeton, NJ, 2019. ISBN 9780691190082.

Yiran Yang, Yu Liu, and Bin Zhang. Evolution characteristics and influencing factors of green trade in china and rcep countries. *Frontiers in Environmental Science*, 11: 1211121, 2023. doi: 10.3389/fenvs.2023.1211121. URL https://www.frontiersin.org/articles/10.3389/fenvs.2023.1211121/full.

Wen Zhang et al. Evaluating china's 2030 carbon peak goal: Post-covid-19 scenarios. *Renewable and Sustainable Energy Reviews*, 2024.

ZhongXiang Zhang. The united states' climate credibility crisis. *East Asia Forum*, Jun 2025. URL https://www.eastasiaforum.org/2025/06/07/the-united-states-climate-credibility-crisis/.