

Net Zero Divide: The Geopolitical and Economic Landscapes of the Energy Transition on the Global North and South

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Abstract

This article explores how global strategic shifts may undermine net-zero goals, reinforcing the Global North's competitive advantages while fostering asymmetry in climate trajectories. This imbalance risks an unequal divergence in climate goals, ultimately hindering a fair and equitable global energy transition.

The Global Energy Transition: Emerging Trends and Geopolitical Realities

The urgency behind the goal of net-zero emissions stems from overwhelming scientific evidence that continued climate warming will impose irreversible ecological and economic costs, an understanding that is now widely acknowledged in many governments and organizations. Changing sentiment on global warming led to international cooperation through historical landmark events such as the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, where nearly 200 nations pledged to curb emissions and work toward net-zero carbon emissions by 2050, marking a turning point in global climate governance. Subsequent Conferences of the Parties (COP) refined the framework, shaping climate finance mechanisms, and setting legal obligations for emissions reductions. Since international cooperation on climate change began, advancements in the reduction of carbon emissions have been documented, with the World Economic Forum's Energy Transition Index (ETI) reporting that since 2015, "out of 120 countries, 107 have shown progress over the past decade, with 30 countries seeing their scores increase by more than 10%."

Despite the efforts to combat climate change, new trends, challenges, and opportunities have emerged on the global stage, prompting renewed discussions on short and long-term outlooks and priorities. Recent global developments, including concerns over energy security, the rise of artificial intelligence, and international trade relations have become increasingly prominent. These developments have caused governments, businesses, and public sentiments to change, which may jeopardize the energy transitions goals. A recent analysis of ETI scores shows that "only 20 countries improved scores across all three dimensions in the past year" (WEF, 2024), suggesting that priorities may be shifting. While climate change has long been perceived as a global public good (Andre, Boneva, Chopra, & Falk, 2024), the pathway to net zero may be evolving in response to these new developments and changing sentiments.

The global push toward Net Zero has been a defining objective for many governments, industries, and

international organizations. Recent developments and geopolitical shifts have introduced new complexities that are reshaping the trajectory and priorities of the transition. As nations navigate these new challenges, several key global trends have emerged as particularly impactful:

1. An increased focus on energy security and the need to secure critical minerals and supply chains (Kim, Jaumotte, Panton, & Schwerhoff, 2025).
2. The pursuit of a first-mover advantage in the global race for artificial intelligence (Qutbah, 2025).
3. Increased trade recalibrations, disputes, and negotiation ensuing uncertainties and consequentially heightening volatility in financial markets. (WEF, 2025).

These interconnected trends can collectively shape the trajectory of the global energy transition. While decarbonization remains a widely acknowledged global goal, emerging trends indicate a shift in priorities that present lucrative opportunities and substantial opportunity costs that cannot be disregarded. These trends can influence the effectiveness of transition efforts and carry long-term implications, an effect that Gross and Finley observe, "a cooperative and open trade market would lead to a faster and less expensive energy transition," but rising "geopolitical tensions and rivalries will likely make this ideal solution unreachable" (Gross & Finley, 2025).

As a result of these changes, the trajectory of the climate transition appears to be shifting. The Global North, leveraging its economic and political competitive advantages, is well-positioned to capitalize on the evolving landscape, while the Global South, constrained by financial and structural limitations, remains unable to adapt in a similar fashion, potentially deepening the divide between the two regions. These changes may have significant long-term consequences: without substantial support and collaboration from the Global North, the Global South will struggle to decarbonize while maintaining its economic development, increasing carbon emissions, and jeopardizing climate targets. Leading to disparate climate reduction achievements between the Global North and South, reinforcing asymmetries in climate transition efforts and the need for a more equitable approach to sustainable development.

Challenges of the Global North and South

Understanding the divide between the Global North and Global South is essential to analyzing the dynamics

of the energy transition. The Global North generally comprises economically developed, industrialized nations with advanced technologies, high living standards, and significant influence in global policymaking. Countries such as the United States, members of the European Union, and parts of East Asia hold competitive advantages in renewable energy adoption, research, and climate policy leadership.

In contrast, the Global South includes developing nations that often face economic and infrastructure challenges preventing change, limiting their capacity to adopt clean energy technologies. Many rely heavily on natural resource exports and grapple with energy access and affordability, all while attempting to balance economic growth and sustainability (Hickel et al., 2022).

While the Global North sets ambitious climate targets and drives innovation, the Global South must navigate developmental priorities alongside sustainability goals. Given historical context and current trends, energy transition outcomes are likely to diverge significantly between the two regions. The assumption that access to increase capital or technology alone can ensure successful transitions in the Global South reflects an overly optimistic view that risks deepening the existing divide.

This perception underestimates the significant constraints faced by the Global South in its climate change related efforts. In a paper analyzing 172 regional mitigation scenarios consistent with the Paris Agreement targets, Hickel and Slameršak found that “OECD countries and the rest of Europe consume 2.3 times more energy than the average in the Global South (119 GJ per capita vs. 52 GJ per capita)” and that “only 11 of the 172 scenarios analyzed have the Global North–Global South energy gap declining to less than 30 gigajoules per capita per year by the end of the century” (Hickel, J., & Slameršak, 2022). Their research demonstrates that the global framework set forth in the Paris Agreement does not adequately address the complex and divergent realities of the Global North and South when it comes to energy transition efforts.

While the Global North benefits from centuries of economic and institutional development, its competitive advantages are being leveraged in a multifaceted strategy in reprioritizing climate change goals. However, this shift risks deprioritizing collaboration, investment, and self-sufficiency, factors that the World Economic Forum (Majid, 2025) identifies as essential to a successful energy transition in the Global South.

Overlooking the Global South’s constraints could intensify climate change and obstruct energy transition. Without significant subsidies and technological cooperation, the Global South may rationally reprioritize its energy supply and demand goals, reinforcing “domestically available coal, oil, and gas serve[ing] as critical pillars for ensuring the security of supply” as they “are primary sources of revenue for numerous countries.” If clean energy technologies fail to become cost-competitive with carbon-intensive alternatives, adjusting market incentives alone will be insufficient for a sustainable transition.

Beyond market mechanisms, structural and economic issues facing the Global South, the realities of the region must also be addressed to ensure a stable and secure energy transition. A “rapid phaseout of fossil fuels could result in widespread unemployment, political unrest, and destabilization, all counterproductive to addressing climate change” (Singh & Arya, 2024). A comprehensive strategy is needed, one that incorporates both targeted market interventions and economic aid for success in the long term.

The Global Energy Transition in a Fragmented Landscape

The global energy transition is reshaping geopolitical dynamics, and the gap between nations capable of independently meeting climate targets and those reliant on external support has widened. The differences between the Global North and Souths’ economic structures, industrial capacity, and policy frameworks determine the feasibility of sustainability goals, creating divergent trajectories for advanced and emerging economies.

Among the most influential Global North policies are the U.S. Inflation Reduction Act (IRA) and the EU’s European Green Deal. The IRA allocates nearly \$400 billion to clean energy, targeting investment in renewables, EVs, hydrogen, and carbon capture (Kumar et al., 2022). The European Green Deal mobilizes €1 trillion over a decade to promote renewable energy, efficiency, and environmental policies (European Commission, n.d.).

Beyond financial and industrial strength, the Global North wields institutional, military, and technological leverage. Influence over capital markets facilitates favorable investment conditions, while geopolitical dominance enables access to critical minerals like lithium and rare earth elements, at favorable terms, which are vital for renewable technologies and battery systems.

While these advantages allow the Global North to advance their sustainability goals, they also contribute to structural imbalances in global energy markets. Many developing economies in the Global South face difficulties in securing liquid markets, specialized labor supply, or deploying advanced technology at comparable scales to the North, reinforcing the inequalities in climate adaptation. Addressing this divide requires international cooperation, equitable resource allocation, and strategic policy alignment to ensure a balanced and inclusive global energy transition.

The New Geopolitical Landscape: Intensifying Divides in the Energy Transition

Since the UNFCCC and Paris Accords, the energy transition has evolved amid rising geopolitical uncertainty. While the Global North can navigate risks more effectively, the Global South faces heightened vulnerability. Understanding these dynamics is critical for evaluating global energy transition outcomes. Wang et al. (2024) find that “there is a negative correlation between geopolitical threats, geopolitical acts, geopolitical risks and

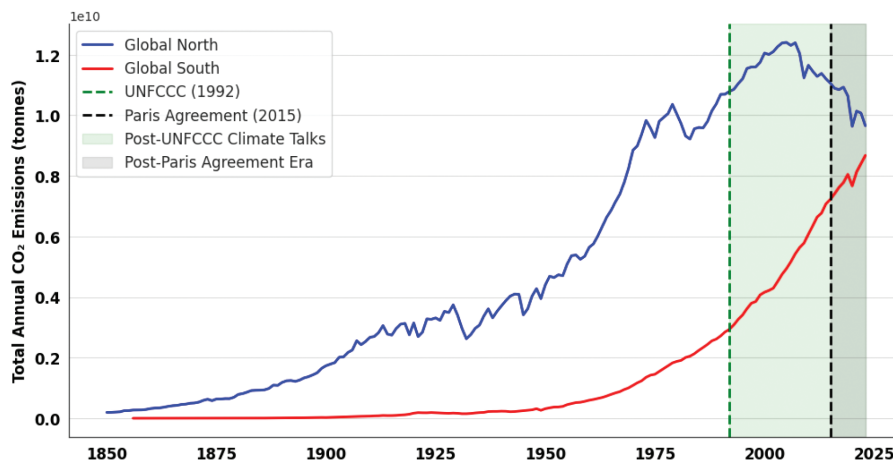


Figure 1: CO₂ Emission Trends in the Global North and South, 1850-2023

Note: Emissions are in metric tons of CO₂ per year. Regions are classified based on economic development, energy infrastructure, and reliance on fossil fuels: the Global North includes developed, high-income nations with advanced energy systems; the Global South includes emerging and developing economies often reliant on fossil fuels or facing energy access challenges.

Source: <https://ourworldindata.org/co2-emissions>

energy transition” and that “geopolitical risk has a negative impact on the energy transition and slows down the process... as geopolitical risk increases, the elasticity of energy transition to geopolitical risk increases.”

Zhu et al. (2025) further observe that “geopolitical risk negatively impacts energy transition[s] more in developed countries due to their high dependence on the international energy market than in non-developed countries, where internal economic and infrastructural factors more influence energy policies.” They note that while geopolitical risks have slowed the transition in the Eastern Hemisphere due to reliance on transnational energy chains, “Western Hemisphere countries [have used] geopolitical risks to transition to energy independence,” citing examples like U.S. trade renegotiations and the EU’s ban on Russian seaborne oil and the creation of an EU Gas Purchasing Platform (Marhold, 2023).

Additionally, Zhu et al. (2025) explain that “large natural resource rents considerably boost geopolitical risk dampening... resource-based economies are more inclined to safeguard old energy supplies than promote renewable energy options amid global conflicts.” This reveals a core divide: while the Global North possesses the capacity to advance clean energy, resource-dependent Global South economies often remain tethered to fossil fuels as a risk management strategy.

Energy transitions traditionally follow a historical pattern: nations initially rely on low-cost, high-density fuels before shifting to cleaner sources as institutional strength and investment grow. Yet, many Global South countries face limited capital access, specialized labor shortages, and weak governance, stalling renewable adoption. In the absence of sustained international support, these nations may prioritize low-cost fossil fuels such as coal (South Africa, Indonesia, India, China) and heavy crude oil (Venezuela, Nigeria, Mexico) to meet short-term demand, reinforcing environmental and opportunity costs.

Emissions trends underscore this divergence. According to the European Commission’s *GHG Emissions of All World Countries 2024*, “top emitters, in 2023 China, India, Russia, and Brazil increased their emissions compared to 2022, with India having the largest increase in relative terms (+6.1%) and China the largest absolute increase by 784 Mt CO₂ eq.” The report also states that “global GHG emissions... have increased by nearly 1.5% annually on average since 1990, and they were 61.8% higher in 2023 than in 1990.” Among major emitters, China, India, Russia, and Brazil saw increases, while the USA (–1.4%) and EU27 (–7.5%) saw declines (Crippa et al., 2024).

These patterns of emissions are further contextualized in Figure 1, which illustrates the historical divergence of CO₂ emissions between the Global North and Global South from 1850 to 2023. The figure demonstrates how emissions from the Global South have sharply increased since the 1990s, coinciding with accelerated industrialization, while emissions in the Global North have plateaued or declined post-2005. Despite the implementation of major climate accords such as the UNFCCC (1992) and the Paris Agreement (2015), emissions trajectories suggest that mitigation efforts have had an uneven impact, with the Global South still on a steep upward path. This divergence highlights the structural imbalance in global energy and climate politics: while the Global North had decades of high-emission growth before transitioning toward cleaner alternatives, the Global South is now attempting to industrialize in a more carbon-constrained world, often without the same financial and institutional support.

Summary

As global complexities continue to evolve, the solutions of tomorrow must adapt accordingly. The pursuit of net-zero emissions and the energy transition

has shaped national strategies for decades. However, recent developments, including heightened concerns over energy security, the growing influence of artificial intelligence, and the recalibration of international trade policies, have introduced new uncertainties that are redefining the geopolitical and geoeconomic landscape. Highlighting the systemic imbalances between the Global North and South, producing divergent realities in the result for achieving net-zero emissions for both regions.

Advanced economies in the Global North, supported by technological innovation, geopolitical leverage, and financial resources, are accelerating for adjusting their energy transitions while meeting emerging trends. In contrast, the Global South, face significant obstacles in achieving a sustainable energy transition without compromising economic growth and internal stability. Under conditions of heightened uncertainty, limited access to investment, lack of technical expertise, and overall support from the Global North, the Global South may continue to rely on carbon-intensive resources to meet energy demand, increasing abatement costs, and deepening reliance on fossil fuel infrastructure.

If current trends persist, global efforts to stabilize energy markets and mitigate climate change risks will be increasingly challenged. Bridging the gap between the Global North and South will require strategic investments in energy infrastructure, innovative financing mechanisms, and technology transfers. Without these interventions, disparities in energy transition pathways will deepen economic and energy inequalities, further complicating global climate objectives.

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