

Rethinking Energy Security: Geopolitics, Economics and Climate Change in a Fragmenting World Order

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Abstract

Through most of the last century, "energy security" carried a fairly narrow meaning: whether a country could obtain enough oil, gas or electricity, at a price it could bear, without serious interruption. That framing has worn thin. Armed conflict, sanctions regimes, rivalry among major powers, fractured supply chains and a warming climate have together pulled energy questions much closer to the centre of international security debates. Russia's war in Ukraine, continuing instability across the Middle East, and intensifying competition over critical minerals all point in the same direction: energy markets are now bound tightly to foreign policy, national security and economic resilience.

This paper follows how the meaning of energy security has shifted, examined through three lenses economics, geopolitics and climate change. Its central argument is that energy is no longer simply a commodity traded on international markets. It has become a strategic resource that states use to project influence, manage their exposure to risk and pursue their own interests. Moving toward renewable energy does not take geopolitics out of the equation; it arguably opens new fronts of competition, over critical minerals, technology, manufacturing capacity and the supply chains linking them together.

Drawing on realism, geopolitical economy and securitisation theory, the paper

develops a multidimensional reading of energy security — one that extends beyond simple access to energy and takes in economic stability, strategic autonomy, technological capability, infrastructure protection and climate sustainability. Understood this way, the emerging energy order looks less like an end to geopolitical rivalry and more like its migration into new terrain.

Keywords: Energy Security; Geopolitics; International Relations; Climate Change; Energy Transition; Economic Security; Critical Minerals; Resource Politics; Great-Power Competition; Securitisation.

1. Introduction

Energy is woven so deeply into daily life that most people only notice it when something breaks down. It keeps homes lit, moves people and goods, and underpins the technologies that modern economies rely on. For decades, discussions of energy security stayed fixed on one question: could states obtain enough energy at prices that were stable and manageable?

That question no longer covers what is actually happening. Today's energy system operates against a backdrop of war, strategic rivalry, sanctions regimes, technology races and mounting climate pressure. Pipelines, ports, refineries, power grids and shipping lanes now carry significance well beyond their engineering purpose — and dependence on a single supplier can turn into a political liability almost overnight.

Russia's invasion of Ukraine made this point unmistakably. As European energy supplies were disrupted and then rebuilt from scratch, it became obvious that reliance on energy imports is not simply an economic matter — it can carry direct consequences for foreign policy and national security.^[2] Instability across the Middle East, disrupted shipping lanes, and rivalry over strategically valuable resources tell a similar story.

At the same time, the global push away from fossil fuels is adding its own layer of

complexity. Batteries, electric vehicles, renewable technology and storage systems all depend on minerals and manufacturing capacity that are distributed unevenly around the world. Moving away from fossil fuels may loosen some old dependencies even as it creates new ones.³

The argument this paper develops is that energy security can no longer be reduced to a question of whether resources exist. What increasingly matters is who controls the resources, infrastructure, the technology, the markets and the supply chains — and what that control means for relations between states.

2. Research Problem

Energy security has traditionally been treated as though economic efficiency, national security and environmental sustainability belong in separate boxes. Recent events make that separation difficult to sustain.

A geopolitical conflict can knock out supply and send prices climbing. Sanctions redirect trade flows and reshape entire markets. Climate policy cuts demand for fossil fuels while raising demand for critical minerals and clean-energy hardware. States, meanwhile, are working to claw back control over supply chains they view as strategically important.

The problem this paper takes up, then, is how energy security is being reshaped under the combined pressure of geopolitical conflict, economic interdependence and the shift toward cleaner energy. Is the global energy transition actually easing older forms of insecurity, or is it simply moving geopolitical rivalry onto a new set of resources, technologies and networks?

3. Research Questions

1. How have present-day geopolitical conflicts reshaped what energy security means?
2. How does dependence on imported energy affect security, both at home and abroad?
3. In what ways does energy function as a tool of geopolitical leverage?
4. How is climate change altering conventional approaches to energy security?
5. Does the shift to renewables ease geopolitical rivalry, or does it simply create new

competition over resources?

6. What relationship is emerging between critical minerals, energy technology and strategic autonomy?

7. How might states reconcile energy security, economic resilience and climate goals within a more fragmented international order?

4. Objectives of the Study

This study sets out to trace how energy security has evolved within the current international system; to examine the connection between energy resources and geopolitical power; to consider the economic fallout from energy dependence and supply disruption; to assess how conflict and sanctions affect global energy markets; to weigh the security implications of climate change and the energy transition; and to gauge the growing importance of critical minerals and energy technologies.

5. Theoretical Framework

This paper draws on three complementary traditions — realism, geopolitical economy and securitisation theory — to explain why energy has outgrown its status as a purely economic question and is increasingly discussed in the language of national and international security.

5.1 Realism and Energy Power

Realist thinking treats states as operating in an environment where security and power are the abiding concerns. Viewed through that lens, energy resources look less like ordinary commodities and more like strategic assets. States pursue reliable access to energy because their economic strength, military capacity and political stability all depend on it.⁴

This lens also draws attention to the vulnerability that comes with dependence. A state leaning heavily on a single external supplier can find its options narrowing during a crisis. States that hold large reserves, strong production capacity or control over transit routes, by contrast, can convert those assets into political leverage.

5.2 Geopolitical Economy

Geopolitical economy starts from the premise that markets are never fully separated from political power. Pipelines, ports, shipping lanes, refineries, power grids and financial arrangements all sit inside broader political and strategic structures.

Competition over energy is therefore also competition over infrastructure, investment, technology, markets and influence — which is why shifts in energy trade often ripple well beyond commercial life.⁵

5.3 Securitisation Theory

Securitisation theory explains how energy issues come to be framed as security matters in the first place. Once governments begin describing energy dependence, critical infrastructure or supply-chain disruption as threats to national survival, policies that once looked purely economic take on a security character.⁶

This matters most during crises, when governments tend to place strategic reserves, domestic production, supplier diversification and infrastructure protection ahead of purely market-based calculations.

6. Energy Security and the Geopolitics of Conflict

Recent conflicts have shown that energy infrastructure can become strategically significant in its own right. Pipelines, refineries, power stations, ports and electricity networks affect both military operations and civilian life, and disrupting them can inflict economic pain even when the fighting itself is taking place far from major energy-producing regions.

Energy can equally serve as a lever of political pressure. States with strong production or transit advantages can use supply decisions, pricing or control over infrastructure to influence states that depend on them. Sanctions add a further twist, aiming to squeeze an adversary while reshaping the wider pattern of global energy trade.

The result is a more fragmented energy landscape, in which established trade routes

give way to new suppliers, new markets and new financial and logistical partnerships.

7. Economics of Energy Security

Energy security and economic security cannot really be pulled apart. A sudden spike in energy prices pushes up inflation, raises production costs and erodes industrial competitiveness. For countries that import most of their energy, a sharp rise in global prices also drives up import bills and strains public budgets.⁷

That is why governments increasingly treat diversification as a form of economic resilience — strategic reserves, multiple suppliers, domestic production, renewable generation, resilient grids and alternative transport routes all help cushion the system against external shocks.

The goal, in other words, is shifting away from simply finding the cheapest energy and toward building a system that can absorb disruption without sustaining serious economic damage.

8. Climate Change and the Transformation of Energy Security

Climate change has redrawn the terms of the energy-security debate. Governments now have to balance two demands at once: keeping energy supplies reliable, and cutting greenhouse-gas emissions.

Moving away from fossil fuels can loosen dependence on traditional exporters, but it introduces new dependencies of its own. Renewable technology, electric vehicles and storage systems all rely on minerals and components whose extraction and processing are concentrated in a handful of countries.⁸

The energy transition, then, should not be read as the end of energy geopolitics. It is better understood as a shift in which resources, technologies and supply chains geopolitical competition now revolves around.

9. Critical Minerals and the New Geopolitics of Energy

Lithium, cobalt, nickel, graphite, copper and rare-earth elements have all become

strategically significant because of the role they play in batteries, electric vehicles, renewable-energy infrastructure and advanced technology.⁹

That raises an obvious question: if oil and gas defined twentieth-century energy geopolitics, will minerals, processing capacity and technology define the twenty-first-century version?

The honest answer is that it is complicated. Holding mineral reserves alone does not guarantee power. Processing capacity, technical know-how, investment, manufacturing scale and control of supply chains all matter just as much. The geography of energy power, in short, is becoming more tangled rather than simply shifting from one resource to another.

10. Energy Transition and Great-Power Competition

The energy transition is becoming entangled with industrial and strategic rivalry among major powers. Electric vehicles, batteries, solar panels, hydrogen, nuclear power, energy storage and critical minerals have all taken on economic and national-security weight.¹⁰

As a result, governments are folding climate policy into industrial policy. Subsidies, domestic manufacturing schemes, investment screening, technology restrictions and efforts to diversify supply chains all reflect a growing conviction that control over clean-energy technology translates into national power.

The shift to cleaner energy is thus both an environmental project and a geopolitical one. How it unfolds will depend as much on how states manage cooperation and rivalry as on technological progress itself.

11. Towards a Multidimensional Concept of Energy Security

A contemporary understanding of energy security should move beyond a narrow focus on supply. It should take in at least six interconnected dimensions:

- Availability: reliable access to sufficient energy.
- Affordability: prices that households and economies can sustain.

- Geopolitical security: protection from external coercion and conflict-driven disruption.
- Economic resilience: the capacity to absorb shocks to markets and supply.
- Technological sovereignty: access to, or control over, critical energy technologies.
- Climate sustainability: the ability to meet energy needs while limiting environmental harm.

These dimensions overlap heavily. A country rich in energy resources can still be vulnerable if its infrastructure is fragile. Another might enjoy reliable supply but face strategic dependence because it imports critical technologies. Energy security, then, is best understood as a web of interlocking vulnerabilities and capabilities rather than a single measurable quantity.

12. Conclusion

Energy security is undergoing a deep transformation in the twenty-first century. Oil and gas still matter, but a narrow focus on securing fossil-fuel supply can no longer capture the full picture of contemporary energy politics.

Geopolitical conflict, economic interdependence and climate change are increasingly feeding into one another. Energy resources can generate prosperity, create vulnerability and serve as tools of political influence — sometimes all at once. The energy transition adds a further layer, shifting attention toward critical minerals, advanced technology, manufacturing capacity and supply-chain resilience.

The central claim of this paper is that energy security is now less about the raw availability of resources and more about power, resilience and strategic autonomy. The energy geopolitics of the future will be shaped not just by who holds oil and gas reserves, but by who can control technology, minerals, infrastructure, finance and supply chains.

That makes energy security a genuinely interdisciplinary problem, sitting at the crossing point of international relations, political economy, environmental politics and national security. Making sense of where it is headed means working across these fields rather than

treating them as separate. In the end, the emerging energy order will hinge on how states balance rivalry with cooperation, autonomy with interdependence, and economic growth with the urgent demands of climate sustainability.

Footnote

1. International Energy Agency, World Energy Outlook 2023 (Paris: IEA, 2023).
2. International Energy Agency, "A 10-Point Plan to Reduce the European Union's Reliance on Russian Natural Gas," IEA, 2022.
3. International Energy Agency, Global Critical Minerals Outlook 2024 (Paris: IEA, 2024).
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9. International Energy Agency, The Role of Critical Minerals in Clean Energy Transitions (Paris: IEA, 2021).
10. Daniel Yergin, The New Map: Energy, Climate, and the Clash of Nations (New York: Penguin Press, 2020).

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