EXPLAINERS

What is Energy Security?

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EXECUTIVE BRIEF & KEY FINDINGS

Energy security is generally considered a technical problem related to how many resources a country possesses and how much it usually imports. This paper argues that this analysis is incomplete as energy security combines power, dependence and perception, answering the underlying question of who controls the flow of energy, the costs of disruptions and the political leadership's willingness to decide the degree of dependency. The core argument of this paper suggests that a country's energy security is managed by pulling three levers at once — diversification from unreliable suppliers and building leverages, establishing cooperation at the international levels through unilateral and multilateral institutions and framing energy security as a security threat to legitimize swift actions. This paper also discusses how India is pulling all three levers at once through buying discounted Russian oil and increasing diversification, cooperating at multilateral platforms like the International Solar Alliance and creating a supply chain for critical minerals and, lastly, signaling the importance of chokepoint politics in public debate. A comprehensive understanding of energy security requires studying all three dimensions together rather than as one.

1. Introduction: Why This Matters

The aftermath of the Industrial Revolution and the boom in the modern economy saw surges in energy demand to run factories, data centers, farms, militaries and for household needs. Energy flows can be thought of like blood across the

body which is vital for the sustenance and preservation of humankind. Similarly, energy security forms, a vital national interest for any nation requiring enough energy at a stable price and without interruption. But this explanation does not answer the harder questions: enough energy according to whom and how to secure it?

The answer matters because it shapes what governments actually do. The ongoing Russia-Ukraine war witnessed how efficiently energy trade can be weaponized, after which the Iran-Israel-US conflict proved that the Strait of Hormuz, a single narrow waterway, can put Asia's energy security at risk. Growth in the clean energy sector has created certain sets of vulnerabilities based on critical minerals like lithium and cobalt. Thus, energy security is not one problem; it is several overlapping ones and any serious analysis needs to treat them separately.

This explainer studies what energy security means, its development with diverse perspectives on its literature, tracing government actions to secure it, analyzing real-world cases, and finally what all this means for India specifically.

2. Definition and Scope

The *International Energy Agency* (IEA) presents a straightforward definition, which states: uninterrupted availability of energy sources at an affordable price. This can provide an outer shell of definition but leaves the important questions unanswered— who guarantees the uninterrupted supply, what counts as a threat to energy security and at what point a shortfall becomes a crisis.

Cherp and Jewell (2014) provide a key academic definition where they describe it as low vulnerability of a country's vital energy systems which involve its resources, grids, pipelines, ports and such parts which keep its society functioning. The extent of vulnerability can be defined by combining two things involving a country's exposure to shock and its ability to absorb it. This means that a resilient energy security apparatus does not only imply robust availability of physical resources but also on the system's ability to absorb and adapt to new changes in order to secure uninterrupted energy supply at an affordable price.

Another significant and widely used four A's framework proposed by Asia Pacific Energy Research center (APERC), later cultivated by Kruyt et al. (2009) assesses energy security through four dimensions— Availability (physical presence of resources), Accessibility (whether these resources can be extracted), Affordability (keeping the prices stagnant and affordable for all) and finally, Acceptability (the impact of using these resources is socially and environmentally tolerable).

This was further expanded by Sovacool and Mukherjee (2011) into twenty measurable indicators including the technological development and regulatory mechanisms along with availability, affordability, and accessibility within the country to manage energy security.

Thus, energy security cannot be reduced to a single number i.e. analyzing it only based on import- dependence percentage but also involves physical, economic, geopolitical (supply-chain security) and transitional (involves analysis to understand the adaptation towards cleaner energy alternatives).

3. Historical Development: How the Idea Evolved

The contemporary analysis of energy security begins with the 1973 Arab oil embargo, wherein small oil-producing states in the Gulf reduced the supply to countries supporting Israel, increasing prices considerably. This indicated the vulnerabilities of developed Western economies to a small number of oil-producing countries, which further led to the creation of the International Energy Agency in 1974 to institutionalize supply-chain security, mediating through emergency measures and foreseeing future shocks.

During the 1979 Iranian Revolution, a second oil shock was triggered; initially, energy security was considered a geopolitical and military problem which was to be addressed through diversification of the supply chain, establishing strategic reserves as prescribed by IEA and protection of SLOCs through demonstration of naval power. By the end of Cold War, tensions within the oil markets eased and it became more stabilized, however, it led to a change in features of energy security moving from a more direct confrontation towards diplomatic routes such as the gas pipeline politics that took place between Europe and Russia.

The turn of the 21st century witnessed the rise of demands for energy from China and India, thus becoming a permanent national interest for both the nations while the formation and popularity of green parties across the globe laid the foundation for adopting cleaner fuels with emphasis on sustainable development as climate change in itself is a long-term energy risk. During this time the four A's framework was formalized as earlier its energy security policies were merely reactive and crisis-driven.

Post 2010, another dimension was added, demarcating a shift towards renewable energy, which brought a new set of dependencies based on rare-earth minerals and creation of clean technology supply chains indicating that the older hydrocarbon risks have not faded away whilst also being joined by new sets of vulnerabilities.

4. Theoretical Foundations: Three Ways of Thinking About It

There is no particularly accepted theory of energy security, but three broad lenses are available each of which has its unique characteristic while incomplete on its own.

4.1 The Power Lens

Here, an analogy is drawn between a country's military capability and energy security as a strategic resource which can be used to pressure country B's actions in accordance with country A.

This is highlighted in the work of Kalicki and Goldwyn where sea lanes, pipelines and supply chains function as instruments of statecraft to foster national interest.

Kilinç-Pala (2021) also subscribes to this realist perspective, arguing that the dependency of country B on country A for energy is not merely a technical fact but could also be used as leverage against the former.

4.2 The Interdependence Lens

This perspective stems the importance of the complex interdependence approach of Keohane and Nye, they underline the mutual dependence of buyers and suppliers; a distorted supply chain would reduce the revenue of the supplier as much as it will hurt the buyer's economy, thus creating an environment of cooperation for mutual benefit rather than confrontation. To institutionalize this cooperation the International Energy Agency was established to make cooperation reliable, trusted information sharing, discouraging unilateral actions which could disrupt the global economy and coordinating strategic reserves.

4.3 The Perception Lens

This states the importance of formation of a narrative around energy vulnerability and how it gets talked about. Inspired by the Copenhagen school of work on securitization (Buzan, Wæver, and de Wilde) highlights that an issue can only become a 'top priority' once it has been politically framed in a public forum. By doing so, they gather public legitimacy and a political consensus is formed over extraordinary measures such as, emergency spending, strategic reserves

developments and so on. This approach explains the different orientations of two import-dependent countries due to the presence of different political cultures; one country treats it as a routine business while the other considers it as a crisis situation based on their respective domestic politics.

4.4 Why All Three Matter Together

These three lenses have different arguments each describing a particular phenomenon but when put to practical sense, each is incomplete on its own. States usually test all three at the same time with different lexical orders based on different relationships. We witness countries acting defensively towards particular suppliers whom they do not trust completely; publicly describing a specific chokepoint as an urgent threat while closely cooperating with other countries and institutions, all forming an overall energy strategy. Hence, reading energy security through only one lens might risk missing the full picture.

5. How It Works: The Tools Governments Actually Use

In practice, governments undertake a consensus-driven toolkit to pursue energy security. To ameliorate the vulnerabilities of global supply chains and energy security, they build strategic petroleum and gas reserves, diversify their hydrocarbon mix — coal, gas, petrol, and diesel, while also enhancing renewable energy capacity and investing more in domestic exploration and production. Affordability is also taken under consideration by signing long-term supply contracts using price-hedging instruments and policies for domestic consumers are created by managing taxes and subsidies against price hikes.

To reduce dependence on any single supplier or route, they diversify — buying from multiple countries, using multiple transit routes, and in some cases settling trade in local currencies. Hard power also provides a cushion for securing energy as naval and maritime-security capabilities protect a nation’s vital energy interests by safeguarding the narrow shipping chokepoints through which the world's energy still moves. This diversification logic is not limited only to hydrocarbons; it is also being used to meet the requirements for production of clean energy as governments are importing critical minerals and securing battery supply chains, to avoid the old oil dependence problem.

At an institutional level, these tasks are initiated and coordinated through energy ministries, legitimate reserve authorities and multilateral institutions like the International Energy Agency. Mini-lateral partnerships are also established allowing them to strengthen supply-chain resilience outside a formal structure like the *Quad Critical Minerals Initiative* which coordinates economic and investment opportunities for procurement of critical minerals between the US, India, Japan and Australia. Thus, several overlapping backups are the underlying guarantee for energy security and no single tool is enough on its own.

6. Case Studies

The 1973 oil embargo presents a perfect example of how energy was used as a coercive weapon resulting in the institutional response in the form of the International Energy Agency and creation of national strategic reserves which still shape energy policy today.

In contemporary case studies, the Russia-Ukraine war since 2022 provides a suitable case. Before the war, Europe imported almost 45 percent of its natural gas, 27 percent of its oil and half of its coal from Russia. This war triggered a rapid shift of Europe towards Norway, the United States, and Algeria for its energy imports of oil and LNG, employing renewable rollouts like the Repower EU plan, which is an energy policy of the EU demonstrating independence from Russian energy imports by 2030 by domestically enhancing renewable energy generation and electrification.

A comprehensive case study could be analyzed through the Iran-Israel-US conflict, involving the threat of a complete blockade of Strait of Hormuz bringing in all three dynamics at once: the calculation of leverage at stake by countries in a key chokepoint, to absorb the shocks the importing countries are initiating diversified and coordinated efforts to ensure backup reserves and governments are formulating policies to diversify and to enhance reserve capacities by publicly citing the energy security threat as its justification.

7. Why It Matters Right Now

The contemporary scenario puts energy security at the center of geopolitics and diplomacy. Firstly, we are witnessing the conversion of energy trade from a commercial process to a tool for coercion and agenda-setting, through the use of embargos, sanctions, customs, and financial limitations, which demonstrates that interdependence alone cannot be a deterrent to energy security. Secondly, new vulnerabilities have emerged due to clean-energy transitions based on critical minerals, and processing capacity for cobalt, lithium, and other rare earth minerals is concentrated in a handful of countries, which is again creating conditions similar to those long seen in oil markets. Thirdly, maritime chokepoints like the Strait of Hormuz, Bab El Mandeb, and the Red Sea have experienced repeated disruptions, suggesting that the physical trade routes matter as much as the owners of the resources on the ground.

This suggests that the overlapping of all the dynamics and an integrated approach strengthen energy security. Efficiently dealing with energy security demands quick adaptability by countries in building robust supply networks, physical trade routes, and the use of diversified fuel types if tension builds.

8. What This Means for India

Energy security forms a vital national interest for India as the country imports nine-tenths of its crude oil and half of its natural gas, and the major chunk of it moves through the Strait of Hormuz. With the price spikes and supply disruptions in West Asia, a sudden inflation and financial strain can be felt here. So, a diversified approach is needed to alleviate the vulnerabilities at its lowest level.

On the power and leverage track, India is trying to diversify a list of its suppliers beyond the boundaries of West Asia to include Russia, the United States, and suppliers from parts of Africa and Latin America. To strengthen this interest, maritime security is safeguarded through its naval presence in the Indian Ocean based on the SAGAR doctrine (Security and Growth for all in the region) and by protecting the shipping lanes. The recent anti-piracy operations in the Indian Ocean and Gulf of Aden under Operation Sankalp showcases India’s readiness to secure its national interest. To manage its dependence on energy resources, India is still sticking to buying discounted Russian oil, despite heavy sanctions by the US, this shows India is leveraging its dependence to its advantage rather than enduring it.

On the cooperation track, India is leading and investing heavily in unilateral and multilateral platforms such as the formation of the International Solar Alliance, engaging with the International Energy Agency despite not being a full member and signing long-term contracts in order to avoid market volatility with stable lock-in terms and diversified partnerships.

On the perception track, the government is witnessing continuous dialogue within the Parliament and civil society regarding the energy shocks created due to flare-ups in West Asia, exposing the vulnerabilities of the Indian energy market. The policymakers have explicitly marked the Strait of Hormuz as a critical point with diversification of route and reserves expansion along with long-term renewable investments as the only alternatives available to dodge the problem.

The academic discourses on Indian energy reserves, flag an important gap. As India's energy reserves are well below the prescribed limits of IEA; demands reserves equivalent to 90 days of sustenance, but the government SPR (strategic petroleum reserves) currently covers only about 9-10 days only. The Carnegie Endowment for International Peace in its report on India's Oil Security Strategy: Structural Vulnerabilities and Strategic Choices, compare Indian SPR with that of China, Japan and South Korea all of which maintain higher levels than India with China being at the top in the world. Thus, the gap between the actual capacity and the capacity needed to ensure stability is India's biggest energy-security weakness.

Combining every dimension, it reflects that Indian strategy is not scattered but it is working on several tracks at once which proves our hypothesis that energy security is not a single-track race but a mix of overlapping ones.

9. Conclusion

We can conclude that energy security is not a simple exercise as the picture is far more layered. Energy security is shaped by how power and leverage are used, it involves understanding the cooperation and shared risk, and also displays how political leaders choose to frame it in public discourse. All three dimensions are nothing when alone but everything when combined. Thus, the useful way to study any country's energy security strategy is to identify how they balance all three at once.

India is also showing its balance by diversifying the suppliers and trade routes, strengthening multilateral partnerships and mobilizing the masses regarding the energy security vulnerabilities to justify the need for expansion of reserves and investment in its alternative sources of energy. The real gap between rhetoric and resourcing is still to be addressed particularly around the expansion of India's Strategic petroleum reserve. With the changes in the global order and transformation in global energy politics this three-part framework of analyzing energy security remains a useful way to track the real progress and actual shortfalls.

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