

Resilient Futures: Enhancing Energy Security in the Global South

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Abstract: Energy security is a critical concern for countries worldwide, but it often has unique implications for nations in the Global South. Many countries in the Global South heavily rely on fossil fuels for their energy needs. This dependency can make them vulnerable to global oil and gas market fluctuations, geopolitical tension and price volatility. A significant portion of the population in the Global South needs access to reliable and affordable energy services. This energy poverty affects economic development, healthcare, education and overall quality of life. Energy security is not just about having uninterrupted access to energy but also about securing energy supplies at an affordable price. Rapid economic growth in the Global South has led to increasing energy demand. Meeting this demand while ensuring energy supply affordability and reliability is crucial for sustained development. This paper analyses the emerging energy security trends through the most debated contemporary issues, such as climate change, sustainable development and globalisation.

Keywords: Energy Security, Economic Growth, Global South, Sustainable Development, Globalisation.

Energy security is a fundamental component of national development and economic growth, particularly for countries in the Global South facing diverse challenges ranging from poverty alleviation to environmental sustainability. With the rise of emerging economies like India, the dynamics of global energy governance are undergoing significant shifts. India's energy landscape is characterised by a growing demand for energy, a mix of traditional and renewable energy sources, and a commitment to sustainable development goals. As India embarks on its journey towards becoming a global economic powerhouse, its energy policies and initiatives increasingly influence the Global South's energy security paradigm. (Charles Rajesh Kumar. J & M. A.Majid, 2020)

India stands at a pivotal juncture in its quest for energy security amidst the complex dynamics of the Global South. The country's energy demands are

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soaring due to its burgeoning population, rapid industrialisation, and ambitious economic growth targets. However, India's energy landscape is marked by many challenges, ranging from energy access disparities to environmental concerns and geopolitical uncertainties (Charles Rajesh Kumar, J & M. A. Majid, 2020).

This research paper explores the intricate interplay between India's energy security and its position within the Global South. Energy security, a cornerstone of national development and stability, is about ensuring a reliable supply of energy resources and fostering sustainability, affordability, and inclusivity in energy access and utilisation.

At the heart of India's energy security dilemma lies its heavy dependence on fossil fuels, particularly coal and oil, which pose immediate environmental hazards and leave the nation vulnerable to volatile global energy markets. Moreover, the uneven distribution of energy resources within India exacerbates socio-economic disparities, hindering the country's quest for inclusive development (Charles et al., 2020).

In the context of the Global South, India's energy trajectory is intricately intertwined with regional and international dynamics. As a rising economic powerhouse and a prominent voice in global affairs, India's energy policies and partnerships have far-reaching implications for the broader South-South cooperation, energy diplomacy, and the global energy transition (Karim El Aynaoui, Paolo Magri, Samir Saran, 2023).

By elucidating the complex nexus between India's energy security imperatives and its engagements with the Global South, this research endeavour seeks to offer insights and recommendations for policymakers, scholars, and stakeholders committed to advancing sustainable development goals and fostering equitable energy transitions in the 21st century (Karim et al., 2023).

India's Energy Landscape:

Rapid industrialisation, urbanisation, and demographic shifts have transformed India's energy sector. Historically reliant on fossil fuels, particularly coal, to meet its energy needs, India has been actively diversifying its energy mix to include renewable sources such as solar, wind, and hydroelectric power.

The government's ambitious renewable energy capacity expansion targets, as outlined in the National Solar Mission and National Wind Mission, reflect India's commitment to transitioning towards a low-carbon energy future (Karim et al., 2023).

India's energy security strategy is not just about ensuring a reliable supply of energy resources, but also about fostering sustainability, affordability, and inclusivity in energy access and utilisation. The launch of schemes like

the Pradhan Mantri Ujjwala Yojana, which provides clean cooking fuel to rural households, and the Saubhagya scheme, which is focused on universal electrification, underscores India's efforts to address energy poverty and improve energy access across the country.

India's Energy Policy and Global Outreach:

In 2006, India attempted to bring an 'Integrated Energy Policy' (IEP) where she defined her energy security as the continuous availability of commercial energy, which supports economic growth. The fear of shock and disruption of energy supply is a growing concern. The International Energy Agency predicts India's current growth rate will compel India to import 90 % of petroleum by 2025. This makes energy a security issue. IEP & Hydrocarbon Vision 2025 of the Government of India recommend that one route to energy is through diversification of foreign supplies and investment in oil and gas ventures overseas. India has sought new avenues to meet its energy requirements (Sayoni, 2015).

As predicted by many scholars, India will develop good relations with Nigeria, Persian Gulf States, Venezuela and Southeast Asians like Indonesia, among others. In this regard, India is allied with many Asian, African, and Latin American states. Manmohan Singh's foreign policy was oriented toward economic diplomacy and energy diplomacy. The growing role of ONGC Videsh (OVL) is an expression of this drive. Energy diplomacy in these countries is a conscious choice as Africa and Southeast Asia are free from political instability that failed to cease after the Arab Spring.

Moreover, the rise of ISIS has been a growing concern for India, putting her assets and oil supply at risk. Though India can never discontinue oil imports from the Middle East, particularly Iran, the 2015 petroleum agreement with Saudi Arabia during PM Narendra Modi's visit displayed an attempt to explore other reliable oil suppliers as an imperative for Indian energy policy (Sayoni, 2015).

India's Leadership

India's leading ISA can be seen in the context of it being the voice of the Global South. The challenges of affordability and accessibility that India faced in significantly achieving the goals of its National Solar Mission (70 GW installed capacity as of September 2023) are similar to those of the rest of the solar-rich Global South. India has been sharing its experiences of capacity building with ISA LDC and SID member states and financially supporting ISA in implementing its programmes and projects. India is playing a crucial role primarily in promoting energy security and supporting sustainable livelihoods in Africa by assisting impoverished communities with the means to enhance their natural, economic, human and social capital (Guvvadi, 2023).

India's MNRE through ISA has recently inaugurated nine projects for the solarisation of healthcare centres and primary schools in three African countries at the fifth regional meeting in Kigali, Rwanda, on 31 August 2023, of which four are in Uganda, two in Comoros and three in Mali. The ISA partnered with Grid Controller of India Ltd (Grid-India) and the West African Power Pool (WAPP) to host 60 representatives from the West African Region in New Delhi, India, from 14th to 18th February 2023 for solar energy knowledge exchange through a study tour. (Guvvadi, 2023).

India's ISA capacity-building projects have reaped results as well. The Indian government has backed the ISA by offering solar energy training spanning 21 days under the ITEC Scheme. During 2018–2019, 133 participants from 25 countries received training at the National Institute of Solar Energy in Gurugram, Haryana, India, with assistance from the ITEC scheme. An ISA Solar Fellowship for Mid-Career Professionals from member countries through which they can pursue a master's degree in renewable energy management and economics, focusing on solar energy administration aims to establish a competent and well-trained workforce to oversee and administer solar energy initiatives, programmes, and policies (Guvvadi, 2023).

Finance and Scaling Solar

The Affordable Finance at Scale and Scaling Solar Applications for Agricultural Use (SSAU) programmes were launched together by India's MNRE and the French Ministry of Environment, Energy and the Sea at a Ministerial side event on ISA at the United Nations Headquarters in New York, in April 2016. The Export-Import Bank of India (EXIM Bank) has pledged to fund solar initiatives to scale up affordable finance, totalling USD 1.4 billion. Simultaneously, the French Development Agency (AFD) has committed to financing solar projects valued at 900 million Euros, and SSAU has emphasised the implementation of off-grid solar solutions in rural areas. The India, Brazil and South Africa (IBSA) Facility of the UN South-South Cooperation Office has sanctioned USD 2 million for ISA's partner organisation, the United Nations Development Program (UNDP), to support the solar pumping pilot program initiated in 10 African member nations of Benin, the Democratic Republic of Congo, Mali, Niger, the Republic of Sudan, Senegal, South Sudan, Togo, Tuvalu and Uganda to expand solar energy utilisation for agricultural purposes. (Oguntuase, 2023)

The Scaling Solar Mini-Grids Program, aiming to address the energy requirements of ISA member nations in specific regions lacking a reliable grid or with no grid access at all, was introduced on 24 May 2017 during the 52nd African Development Bank Group Meeting held in Gandhinagar, Gujarat, India. The program also explicitly targets island member states with ample solar energy potential. The Scaling Rooftop program to

streamline and pool resources for expanding off-grid and grid-connected rooftop solar installations across ISA member nations by targeting government and institutional buildings, commercial and industrial buildings and residential properties was launched in New Delhi on 11 March 2018 (Oguntuase, 2023).

Solar E-Mobility and Storage

The Scaling Solar E-Mobility & Storage program aims to establish a supportive environment for the widespread adoption of energy storage systems and expand solar energy utilisation in the electric mobility sector within ISA member countries, which very much aligns with the “One Sun, One World, One Grid” vision articulated by Prime Minister Narendra Modi. The ISA aims to establish large-scale solar power generation in various geographical areas within its membership. This, combined with the creation of bilateral, regional, and inter-regional transmission connections holds the potential to eventually connect solar energy resources globally, allowing the transfer of solar energy from one part of the world to another. Nineteen ISA member countries have joined the program, intending to achieve a cumulative capacity of 7,657 MW (Oguntuase, 2023).

Green Hydrogen

The initiation of the GHIC during India's G20 Presidency complements ISA's program, which is centred on green hydrogen introduced during its Fourth Assembly, conducted virtually on 21 October 2021. The primary goal of this initiative is to expedite the production and use of green hydrogen within ISA member countries. Considering the significant cost advantages of producing hydrogen using solar energy in mind and recognising ISA's capabilities, its engagement in this technology through the GHIC could yield a wide array of favourable outcomes for its member countries and the global community (Oguntuase, 2023).

Critical Challenges in the Global South

Affordability of energy

Based on 2024 statistics from the International Monetary Fund, per capita income in India is approximately US\$2,900; in sub-Saharan Africa, it is less than US\$1,800. This compares with more than US\$63,000 per capita income in North America and more than US\$51,000 in Western Europe. The significant disparity in per capita income between the Global North and Global South underscores the critical importance of affordable energy. Solutions feasible in the Western world, such as electric vehicles, carbon capture, utilisation and storage (CCUS), and hydrogen production or importation, may be financially inaccessible in the Global South. While governments in developed countries offer incentives, subsidies or mandates to alleviate costs associated with these transition pathways, those in the Global South often need more financial flexibility to

implement large-scale subsidies. They prioritise providing the cheapest available energy, hydrocarbons in many countries, and subsidising this energy to ensure mass affordability.

Economic growth emerges as the primary solution to bridge this gap, enabling countries in the Global South to offer incentives and subsidies for energy transition akin to those in the developed world. However, access to cheap, affordable energy is crucial to achieving such economic growth, leaving developing nations in a Catch-22 situation. (Ashutosh Singh and Atul Arya, 2024)

Economic and political dependence on domestic fossil fuel endowment

Domestically available coal, oil and gas are critical pillars for ensuring supply security and are primary revenue sources for numerous countries in the Global South. They are vital in funding country budgets and supporting social programs. Moreover, the sector is one of this region's largest direct and indirect employers. Governments cannot afford to swiftly transition away from fossil fuels, which they depend on for national operations, without viable alternative revenue sources.

A rapid phase-out of fossil fuels could result in widespread unemployment, political unrest and destabilisation - all counterproductive to addressing climate change (Ashutosh Singh and Atul Arya, 2024).

Infrastructure bottlenecks

Energy is fundamentally an infrastructure business that involves building massive supply nodes (power plants, solar farms, CCUS and hydrogen hubs, nuclear plants) and interconnections (transmission lines, pipelines) over large distances. Such endeavours necessitate land procurement, sitting and permitting processes before projects proceed. In many developing countries, land ownership is fragmented, and procurement and permitting procedures involve multiple layers of engagement with local, state and federal stakeholders. As a result, setting up large-scale solar farms, gas pipelines, and electric grids can encounter prolonged delays, especially when projects must navigate multiple jurisdictions and cross county and state lines. (Ashutosh Singh and Atul Arya, 2024)

Access to technology and skilled workforce

Lack of access to technology and a skilled workforce present significant hurdles for energy transition in the Global South. Many countries need the technological infrastructure and expertise to deploy and maintain new energy systems such as carbon capture and storage, direct air capture, and hydrogen projects. Limited access to advanced technologies impedes progress toward sustainability. Additionally, a shortage of skilled workers trained in emerging energy technologies complicates efforts to implement efficient and sustainable energy solutions. Bridging the technology gap

through global collaboration and investing in workforce development is essential to overcome these challenges and facilitate a successful transition (Ashutosh Singh and Atul Arya, 2024).

Financing and cost of capital

Financing and the cost of capital pose substantial challenges for energy investment in the Global South. Limited access to capital markets, high borrowing costs, and real or perceived investment risks deter domestic and foreign investors. This problem is even more pronounced in today's high-interest-rate environment. The lack of creditworthy off-takers and uncertain regulatory environments undermine investor confidence. Currency volatility and political instability amplify investment risks, discouraging long-term commitments. Infrastructure projects require substantial up-front capital, which many developing countries need help to mobilise independently. Consequently, attracting capital and securing favourable financing terms are paramount for advancing energy infrastructure and transitioning to sustainable energy sources (Ashutosh Singh and Atul Arya, 2024).

Paths to progress:

A 'horses-for-courses' approach

We must recognise that each country has opportunities, faces challenges, and must find its way forward. Regional energy pathways for poorer countries could focus on primary energy access and affordability needs—and, once assured, consider more ambitious climate goals. To meet these needs, many countries in the Global South want to be enabled and supported to build their economic and industrial capacity through conventional fossil fuels, especially gas, to meet economic growth needs and to reduce the burning of wood and waste. A “technology leapfrog” from traditional biomass to renewable may be appropriate in some circumstances, but it will be a complex transition pathway for many low-income economies (Ashutosh et al., 2024).

Capacity building to reduce risks

To make clean technology projects in the Global South less risky and attract investments, there is a need to build capacity in logistics, contracting, financing, policies and regulations. Support should also include working together on nonfinancial options such as technology transfer and research and development and providing direct funding. Using the public-private partnership model to develop local workforces to build, maintain and invest in renewable projects will also improve long-term viability and the scaling-up of renewable projects (Ashutosh et al., 2024).

Greater role of multilateral development banks

Seed funding from multilateral development banks (MDBs) has the

potential to attract significant private finance. However, achieving this will demand more effective collaboration. Additionally, MDBs can aid developing nations in establishing robust institutional frameworks and mitigating risks linked to renewable investments. The commitment of US\$61 billion of climate finance from MDBs for low—and middle-income economies at COP28 is an excellent first step (Ashutosh et al., 2024).

North-South collaboration

Government-to-government collaboration and sharing of technology and best practices can provide a jump start for developing countries on their path to energy transition. For example, learning from the on-the-ground execution of policy programmes such as the Inflation Reduction Act could help other governments design even more robust policy frameworks. Technology partnerships on carbon capture and storage, hydrogen, EVs, and other clean tech projects would bring the benefits of experimentation, learning and cost reduction from the Global North to the Global South. Government-to-government collaboration would also help to design effective, transparent and integrated carbon markets that will improve confidence in funding offset projects in the Global South. (Ashutosh Singh and Atul Arya, 2024)

Way Forward

Developed nations and international organisations are responsible for providing financial aid, technology transfer, capacity building and technical assistance to support climate action in the Global South. Renewable development, particularly solar, is growing rapidly in developing countries. Removing permitting and infrastructure bottlenecks will accelerate deployment, grid connectivity and decarbonisation. (Ashutosh Singh and Atul Arya, 2024). The India-led ISA for an equitable green energy transition for the Global South has taken significant steps towards funding, policy, technology, infrastructure and capacity building. The Alliance can enormously contribute to economic growth, energy access, technological innovation and energy security on a global scale if its goals are realised. However, success will depend on the commitment of Member Countries and international partners towards consistent efforts and devising practical strategies for addressing any challenges that may arise in its value chains, financing and technology transfer while capitalising on the agreed framework. The ISA has laid out an integrated institutional infrastructure needed for a sustainable future in solar energy. Still, SDG 7 and the respective Member States' net-zero emissions targets can only be met by massively expediting consolidated climate change action, as it has been forecast that the current rate of climate action will not hold global warming at 1.5°C. ISA's target of only monetary mobilisation by 2030 must be updated to more effective action-oriented targets. The Alliance must begin building on its hard-laid-out foundations

immediately.

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