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Renewables: A New Frontier in India-China Relations?

Introduction

“The transition towards renewable energy represents a game changer for interstate energy relations.”

-Daniel Scholten

As India and China power up their emerging economies, the key question is whether the impact will light a bulb or blow a fuse for global energy transition goals. This paper explores whether the renewable energy transition by both countries is a challenge or an opportunity for India. The most populous markets in the world are also becoming the most fossil fuel-based energy-consuming and GHG-emitting countries. According to IEA, energy accounts for more than three-quarters of total GHG emissions globally.² Both China and India aim to achieve net-zero targets by 2060 and 2070, respectively.

The pursuit of renewable energy-related energy independence has become - even more relevant for them amid disruptions in the Strait of Hormuz during the ongoing US-Israel War on Iran. India imports 80% of its oil, out of which 50% of the supply transits through the Gulf region.³ The dependency is much larger for China, the world’s largest oil importer. China purchases 90% of Iran’s oil exports and sources about 50% of its oil imports via the Gulf region.⁴

China is the largest energy consumer, followed by the US and India. In 2024, India consumed 22% of the energy consumed by China.⁵ Notably, their per capita energy consumption is one of the lowest in the world.

Their energy consumption, from an industrial development lens, is not an anomaly. Most modern developed countries have high energy consumption rates while transitioning from a developing economy to becoming a developed economy. They require more energy to meet the increasing needs of their large population and fuel commercial growth. This industrial growth has long been fueled by insatiable energy

needs, which has led us to climate change. This provides an opportunity for both India and China to become developed countries with renewable energy forming their foundational base.

China’s early and substantial investments in clean energy technology and manufacturing have given it a significant edge in the global renewable energy market. This first-mover advantage made them the supply hub of the world, including for India. The COVID pandemic exposed India’s import dependencies and vulnerability to supply-side shocks. This vulnerability extends beyond just raw materials to include critical components and technologies necessary for India’s renewable energy transition. The China-led border skirmishes, its developing leadership position in Asia, and monopoly over critical minerals, together with China’s position as India’s largest import trader, have disclosed further vulnerabilities in renewable energy adoption for India.

The India-China strategic partnership has witnessed its highs and lows since India’s independence in 1947. In the last few decades, both countries have made significant strides in solidifying their positions in the global order. Considering their key role in the contemporary world order, their collaboration would benefit everyone, especially in achieving energy transition goals.

India and China: Powering Partnerships

A strategic partnership between India and China, especially in the energy transition sector, would lead to seismic changes in global energy production, consumption and pricing patterns. The transformation of these countries from being major polluters to key leaders arresting climate change could be sufficient to protect the planet from its devastating impacts. Further, their united front in renewable energy could alter the global balance of power, potentially reducing the influence of traditional fossil fuel-producing nations.

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The two countries started to collaborate on this back in 2009, when at COP15, both nations came together to forge closer collaboration on the issue of balancing economic growth vis-a-vis international pressure to cut down carbon emissions.⁶ Between 2002 and 2018, India and China issued a series of Memorandums of Understanding on energy exploration, information and sustainability coordination.⁷

In several COP events and UN Conferences, both countries have shared a similar opinion on climate change-related finance, trade and support measures. For example, in COP26 in 2021, both countries aligned on the final agreement to mention global ‘coal-phase down’, replacing ‘coal phase-out’, aligning with their current resources and requirements.

China has played a significant role in India’s energy transition by making available cost-effective equipment and machinery needed for the installation of renewable energy facilities, thus leading to the perception by a section of the Indian industry that China is a catalyst in India’s energy transition.⁸ SAIC was the first Chinese firm to establish a factory in India in 2017 through an acquisition. Beiqi Foton, BYD, Changan Automobile, Chery and other Chinese manufacturers are also playing a key role in collaborating to boost renewable energy adoption in the Indian market.⁹ Several solar energy equipment manufacturing companies are also setting up their offices and warehouses in India, as India is one of the largest solar energy tech markets for several Chinese companies.

In these cases, both countries are prioritising collaboration for mutual benefits over competition for relative advantages, focusing on achieving a sustainable future. They have also been the loudest voice representing the interests of the developing nations. Their collaboration can also make the historical polluters accountable.

Further, if they enter into strategic partnerships, this can reduce the costs of renewable energy technologies globally.

While the potential for collaboration between India and China in renewable energy offers significant opportunities, the reality of their relationship is marked by intense competition and strategic challenges. China’s stronghold in solar manufacturing and critical mineral supply chains could disrupt the balance in the

partnership, raising potential concerns about India’s energy security and technological autonomy. India’s strong push for self-reliance and antagonism towards imports from China may also affect the energy sector collaboration.

India v/s China: High Voltage Tensions

Shifting from competition over fossil fuels, territorial zones and maritime zones, the subject of renewable energy transition has emerged as a new domain of rivalry between these two Asian leaders. The majority of Critical and Rare Earth Elements (REEs), including lithium, cobalt, copper, gold, and uranium, among others, used in the production of EVs, solar panels, wind turbines, and storage batteries¹⁰ are under China’s control.

Leveraging its resources and position as a global manufacturing hub, China has monopolised the production and supply chain as a part of its energy security strategy. In 1990, the Chinese government declared REEs a “protected and strategic mineral”, which prohibited foreign investors from mining these or participating in their smelting or separation projects, except in joint ventures with China’s companies.¹¹ This strategy has led them to control around 70% of the REE global production.¹² A similar situation can be witnessed in solar energy. China accounts for more than 80%-97% of production in all manufacturing stages (such as polysilicon, ingots, wafers, cells and modules) of solar panels.¹³ This has significantly limited the energy transition plans of the Indian government.

It is estimated that this has not only affected the industry economically but also resulted in a loss of approximately 200,000 jobs by 2018, as imports from China began dominating the Indian market.¹⁴ These job losses may have increased since then, the data for which is limited. This indicates that India’s renewable energy transition could become its next oil problem with high dependency on imports.

To strengthen its leadership in energy transition, India and France launched the International Solar Alliance in 2015, which has 120 members. To further counter China’s dominance, India is diversifying its imports and collaborating with the US, Taiwan, Australia, Germany, France, and the EU, among others. However, to secure its energy resources, India is facing difficulties in having a strong hold in Central Asian

and African markets due to tough competition from China. The success of this approach depends on the ability of these alternative sources to match China's scale and cost-effectiveness.

Energy security issues, the high import cost of equipment, and increasing reliance on China as its importing trade partner have motivated India to also develop its own manufacturing industry, catering to the needs of the growing energy sector. Union and State Governments are also facilitating different subsidies, import duties and initiatives to promote the domestic manufacturing industry. One of the key Union Government-led initiatives is the Production Linked Incentive Scheme (PLI) to boost domestic manufacturing in the renewable sector. Recently, the Union Government mandated the use of locally manufactured solar cells from June 2026 to curb its current 70% reliance on Chinese imports.¹⁵ The effectiveness of this policy will depend on India's ability to scale up domestic production capacity and quality in the coming years.

In addition, recognising the vulnerability of power systems to malware attacks, India is implementing stricter inspection protocols for power sector imports and considering banning imports from certain countries. The effectiveness of these measures in enhancing energy security remains to be seen.

Conclusion

This is a pivotal moment in the energy transition sector for India, not only from the aspect of import independence but also from the geopolitical aspect. It is both a pathway to sustainable growth and a battleground for strategic competition. The renewable energy transition represents both a challenge and an opportunity for India. While China has leveraged its first-mover advantage and monopolised critical mineral supply chains, India faces significant hurdles in reducing its reliance on Chinese imports and ensuring energy security. The collaboration between these two states has demonstrated potential in aligning global energy transition goals, particularly through

cost reductions and shared innovation. However, their geopolitical rivalry and strategic competition over resources complicate this partnership, creating high-stake tensions in the energy domain.

With collaborations from the EU, the US, Taiwan, Australia, and others, India has an opportunity to diversify its resources and become a global supply leader. These countries are looking for a reliable alternative, and India fits the bill due to its reliability, political stability, political will for energy transition, and affordable labour force. Their relationship also influences global supply chains for critical minerals and renewable energy components, affecting availability and pricing for other countries.

Once the supply side is ensured, instead of focusing more on subsidies, the policies at the Union and State-level must focus on improving the revenue cycles of the business, especially small and medium-sized enterprises. A compulsory upskilling training on business and finance sessions may be helpful, as financial literacy in India is sub-optimal.

Further, learning from China, it's also important for the Indian private and public entities to have an aggressive marketing and sales strategy to increase their revenue base. Investments in Research & Development also need to be substantially increased to come up with indigenous raw materials and technology. This will help in reducing reliance on foreign innovation, tech and raw material sourcing.

India's path towards establishing a self-reliant renewable energy sector may bring short-term challenges in meeting renewable energy targets due to higher costs and supply constraints. However, in the long term, it will develop a robust domestic manufacturing sector sufficient for both domestic use and exports. This will ensure that the Indian renewable energy sector is protected from supply shocks, promote energy security and help retain vital forex reserves within the country. This will also influence the global balance of power and the future of climate change mitigation efforts.

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