Impact and Policy Research Review (IPRR)
Vol. 2, Issue 2, July - December 2023, pp. 1-5

Insights

India's Energy Security and Renewable Energy Sector Growth:

How far has India reached till now?

Aditi[1]

Abstract

Energy is at the heart of Climate change and a key element for the modern digitally oriented world of the Fourth Industrial Revolution. The constant rise in India's energy demand, growing urbanization, huge dependence on coal for energy needs, and its commitment to reduce greenhouse emissions by 2030 in the COP26 Summit, have put India in the spot to invest in alternative sources of Energy that are clean, affordable, and accessible. The growing notion of combating climate change and making energy accessible to all, India's announcement of the ambitious initiative of the International Solar Alliance, embraces the aim for "One World, One Sun, One Grid" in the COPE26 summit, itself manifests India's strategy for clean energy transition. So, the twin objective of meeting India's rising energy demand and combating climate change can be fulfilled by enhancing the capacity of renewable energy (solar, wind, hydro, etc.) in the current energy- mix of India. Hence, the insight tries to illustrate the current growth story of Renewable energy investment for energy transition by the government of India to enhance the country's Energy and further, it provides some suggestions as a way forward for policymakers. The potent questions such as Do renewable energy deployment in India has shown signs of growth? Will it be able to reduce the demand-supply gap in energy consumption in a sustainable manner? How does the government in India's investment policy and various programs play a pivotal role in diversifying India's energy mix through green energy transition strategies?

Keywords: Energy security, Renewable energy generation, Government programs and incentives

Energy Security and Renewables

Energy security is the key driver for energy transition worldwide. As the rising energy demand grows, renewable energy deployment coupled with investment in low-

[1] Research Scholar, Dept. of HSS, Indian Institute of Technology Patna, Bihar
Email: Aditi.phs17@iitp.ac.in

carbon technology is imperative for transformational growth. Energy security as defined by IEA (International Energy Agency). It is the availability of energy for people at an affordable cost. India's electricity sector is more coal-dominant but now the government channelized its efforts towards enhancement of renewable energy capacity. India ranked 4th largest in wind power and fifth in solar power generation capacity in the world in 2020 but still India's power requirement is estimated to be at 1,650,59 BUs in 2023 (IBEF,2022).

India is also the third largest producer and consumer of electricity in the world. A reliable electricity supply for many consumers still lacking in India. India still relies on fossil fuels for electricity consumption, cooking, and heating. India's recent announcement about its aim to reach net zero emissions by 2070 and to meet 50% of its electricity requirements from renewable energy by 2030 has huge significance to combat problems of climate change (IEA, 2022). A new draft 'National Electricity Plan 2022'has has been prepared that states that India plans no more fossil fuel power plants besides those under construction until 2027and expects non-fossil fuel energy generation of around 44.7% out of total gross electricity generation by 2029-30 (Central Electricity Authority, 2022).

The year 2021 saw the inception of the biggest energy crisis, exacerbated by the Russian invasion of Ukraine in early 2022 and a huge disturbance in global trade. During this time India managed to become second largest Asian market and third largest globally for solar PV capacity, overtaking Germany for the first time and at the time when REN21's Renewable 2022 global status report 2022 sent an adverse report that global energy transition was not happening (The Economic Times, June 2022).

Moreover, India's huge shift to foreign investment by allowing 100% FDI in the renewable energy sector has been fundamental in the inclusion of private capital in building India's energy infrastructure for pioneering a new model of energy self-reliance. The electricity distribution companies are not in financially good condition. Moreover, the levels of pollution in Indian cities and rising energy consumption due to digital technologies have really impacted air quality and the supply gap of energy. Renewable makes energy accessible to all even making it easily available in rural areas.

India has made phenomenal growth in renewable energy deployment. The fall in prices for renewable energy, initiatives for attracting private investment like FDI (100%) in the energy sector, manufacturing of solar voltaic modules, tax incentives for investors and Production-linked incentives, etc., are the key drivers of green energy transition in India recently. Prime Minister Narendra Modi also talked about India's ambitious goal of enhancing India's renewable energy capacity to 500 gigawatts by the year 2030 at the COP26 Summit in Glasgow. According to IEA's Energy Policy Review report (2022), some important insights about India's tremendous record of expanding electricity accessibility by deploying renewable energy technologies are inspiring for many countries around the world. Some of India's energy sector reforms are appreciable such as introducing FDI in India's energy sector, advancing the power and gas market, addressing air quality, shifting

towards solar panel use at homes, offices, educational institutions, and markets, and promoting cleaner cooking and off-grid electrification.

Recently, one of the biggest steps taken by the Indian government is to advance the target of 20 percent ethanol blending in petrol till 2030. Also, domestic mining has been expedited for some important minerals like nickel, cobalt, and copper for building solar panels, EVs, wind turbines, and batteries. India has a huge energy demand; therefore, the Indian government speculates a higher oil dependency in the future and hence facilitates domestic reforms in building oil stocks with The Hydrocarbon Exploration and Licensing Policy (HELP). It also aims to enhance the share of natural gas in the country's energy mix from 6% to 15 % by 2030.

Current Progress in Renewable Energy Deployment

India has made considerable progress in meeting the United Nations Sustainable Development Goals, Goal 7 of Delivering Energy Access. India's per capita carbon emission is 1.6 tonnes of Carbon dioxide, well below the global average of 4.4 tonnes. Products such as LEDs have radically increased rural energy access, helped create local manufacturing jobs, and provided energy-efficient lighting. Moreover, recent reports of IEA also show that India has invested highest in Solar PV than any other fossil fuel source. In 2019, India deployed 84 GW of grid-connected renewable electricity capacity, which is close to India's target of adding 450 GW of renewable energy capacity to the energy mix. In the future, the sharing business model like trading electric vehicles or excess solar energy on consumers' rooftops with the end consumer or in the neighborhood at a competitive price might be the new way of living (Aditi and Bharti (2022).

There are some outstanding statistics that are reflected in the transformational efforts in India's endeavor of green energy transition strategy (Invest India, 2023; Central Electricity Authority, 2022b)

Some of them are listed below:

1. India is the 3rd largest energy-consuming country in the world and 3rd in renewable energy country attractive index in the year 2021.
2. In Renewable Energy Installed Capacity India stands 4th globally, 4th in wind energy, and 4th in solar energy (According to the REN21 Renewable 2022 Global Status Report).
3. India also emerged as the second largest market in Asia for new solar PV capacity and third globally. The total installations of renewable energy (60.4 GW) made India 4rth ranked country in 2021 overtaking Germany for the first time.
4. India's installed capacity of renewable energy has increased by 396% in the last 8 years. The capacity has reached more than 174.53 GW, which is about the country's total capacity (as of February 2023).

5. Moreover, as the boost to foreign investment, FDI (Foreign direct investment) up to 100% is allowed in the renewable energy sector under an automatic route.
6. The proposal of 59 solar parks with an aggregate capacity of 40 GW (like Solar parks in Payagada, Kurnool)
7. In Union Budget 2023, 'Green growth' is one of the nodes of SAPTRISHI (7 priorities) initiative for the reduction of India's carbon emissions by 1 billion tonnes by 2030. The National Green Hydrogen Mission with a total outlay of Rupees 19,744 crores has also been approved.
8. Also, under the Atmanirbhar Bharat initiative, there is an imposition of a basic customs duty of 40 % on Solar PV modules and 25% on solar cells.
9. India's national grid interconnects Bhutan, Bangladesh, Myanmar, and Nepal. Now, India plans Indian national grid into a transformational grid by expanding it to Vietnam and Saudi Arabia to encourage carbon-neutral Solar power generation (Amiti Sen, Nov 2022).

Future ahead

There are various challenges also like land acquisition issues, financial crunch, lack of transmission infrastructure, delays in payments, and delayed regulatory reforms. One of the major challenges is the huge investment gap. India is receiving around $10 to $15 billion annually but its requirement is around $30 billion to $ 40 billion (Myres and Shine, 2022). So, the right policy frameworks such as inducing more foreign or private sector involvement through better incentives like lower interest rates or tax rates for investment, etc, will give a boost to the capital inflows.

India's energy security can be seen in the framework of availability, accessibility, and affordability. The inducement of renewable energy in India's energy mix will add an environmental aspect and is vital for rural electrification. Recently, the secretary of the Ministry of Power in India explained that the energy sector in India requires about 80 % of green finance for energy transition. The main thrust areas are to increase power generation capacity to 50% from the current 41% and secondly, to reduce carbon emissions by 45% in 2030 (Baruah and Bhaskar, Nov 8, 2022). So, reforms like putting government electricity connections on prepaid may only exclude hospitals, drinking water, and street lights.

India should also induce more FDI in the energy sector to reduce the financing deficiency and utilize the technological advancement of foreign investment. More tax incentives, subsidies, land reforms, and manufacturing facilities need to be reformed to attract more investors due to cost and resource advantage. A system like monitoring electricity use and timely payment of electricity bills is required. The challenges like insufficient investment in modern energy infrastructure despite allowing 100% FDI into the energy sector, exorbitant prices of petroleum products, and huge dependence on oil imports, are potent enough reasons to diversify our

energy generation resources. Initially, Electricity consumption in India is only going to rise with the rise in the Gig economy, online education, electric vehicle use etc. so, a huge investment to generate electricity is inevitable for India. The importance of green bonds, carbon tax, and the responsibility of businesses towards environment-friendly production will boost sustainable energy consumption.

We cannot think of completely replacing coal and petroleum products for energy generation in India as if now seeing a huge energy demand deficit, but today's investment in renewable energy can reduce our reliance on fossil fuel products. The clean energy transition is environment friendly, provides energy security, eradicates poverty, reduces air pollution, mitigates greenhouse emissions, and reduces dependence on coal for energy generation.

The estimates of CEA show that by 2030, the share of renewable energy generation will increase to 44% from the current 18% and thermal energy generation will reduce to 52% from 78%. India has enormous potential for energy security with homegrown energy. So, the twin objective of meeting its energy demand and resolving the climate change issue needs to be met through additional renewable energy capacity.

References

Aditi and Bharti. 2022. Foreign Investment in Energy—Mix: An Assessment of Sustainable Indian Cities; In book: Smart Cities for Sustainable Development, Edition: 1, Chapter 15, Springer Singapore, 2022. Available at: http://dx.doi.org/10.1007/978-981-16-7410-5_15

Amiti Sen. Nov 2021. Explainer, All about the One Sun One World One Grid initiative. November 14, 2021, The Hindu business line. Available at: https://www.thehindubusinessline.com/blexplainer/bl-explainer-all-about-the-one-sun-one-world-one-grid-initiative/article37486937.ece

Central Electricity Authority (CEA), Ministry of Power (2022b) Renewable Generation Report. December 2022. Available at: https://cea.nic.in/renewable-generation-report/?lang=en#

Central Electricity Authority, National Electricity Plan, Volume 1, National Electricity plan, 2022-27 (2022a) Available at: https://cea.nic.in/wp-content/uploads/irp/2022/09/DRAFT_NATIONAL_ELECTRICITY_PLAN_9_SEP_2022_2-1.pdf

IBEF. 2022. Renewable Energy Industry in India as of Dec 2022. Available at: https://www.ibef.org/industry/renewable-energy

International Energy Agency. January 10, 2022. India's clean energy transition is rapidly underway, benefiting the entire world. Available at: https://www.iea.org/commentaries/india-s-clean-energy-transition-is-rapidly-underway-benefiting-the entire-world.

Invest India. 2023. "Renewable Energy, Snapshot: Creating a sustainable world", 2023. Available at:https://www.investindia.gov.in/sector/renewable-energy

Myers J. and Shine, I. 2022. "India invested record amounts in renewable last year- so what next for green power in the country?" World Economic Forum, July 7. Available at: https://www.weforum.org/agenda/2022/07/india-investment-renewables-green-energy/

The Economic Times. 2022. India ranks globally for total renewable additions in 2021, The Economic Times. Available at: https://economictimes.indiatimes.com/industry/renewables/india-ranks-3rd-globally-for-total-renewable-additions-in-2021-report/articleshow/92246122.cms?from=mdr