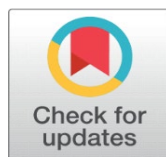
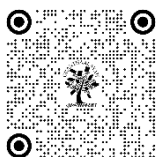


STRENGTHENING ENERGY SECURITY: INDIA'S GLOBAL PARTNERSHIPS IN RENEWABLE ENERGY

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ABSTRACT

In the face of rising energy demands, environment related issues and growth of its economy, the renewable energy is at the core of India's energy security. In India fossil fuels have become too unsustainable, India has gone to embrace renewable energy as an option that is not only viable but necessary. However ambitious domestic policies are in place, such as the National Solar Mission, with a target of 500 GW of renewable capacity by 2030. Yet India's journey to renewable energy is one that it cannot embark on alone, global partnerships are essential in catalyzing this revolution. For example, India has taken advantage of its place as a world class leader in renewable energy with the creation of the International Solar Alliance (ISA) to advance the adoption of solar energy through collaboration with over 100 member countries. Technology transfer, investments and collaborative research on hydrogen and offshore wind have been catalyzed through bilateral engagements with the US, Germany and Japan. In addition to this, India's renewable energy diplomacy has also been bolstered through regional and South-South collaborations, with partnerships to African and SAARC countries. India's role in global energy governance has been amplified through its participation on multilateral forums such as the G20 and International Renewable Energy Agency (IRENA). On the other hand, domestic expansion of renewable energy is abetted by public-private partnerships, along with modern technological integration. Credentials are challenged through financing and grid integration, yet India is actively pursuing renewable energy diplomacy, a key symbol of its devotion to global sustainability and securing a healthy energy future for all. Domestic priorities of India are being aligned with international collaboration creating a future where inclusive, resilient and sustainable energy systems address national and global needs.

Keywords: Energy Security, International Collaboration, Public-Private Partnerships, Technological Integration, Etc

1. INTRODUCTION

For most nations of the world, energy security has become an urgent priority, as surging energy consumption, geopolitical shifts, and the imperative to fight climate change all push for better solutions. Energy security is an important policy imperative for India which has an ambitious economic and developmental agenda to achieve rapid development. The country's energy requirements are set to rise exponentially in the country with its vast population and growing urbanization. Yet fossil fuel-based systems are neither sustainable, nor consistent with the commitments made by the world to tackle climate change. Renewable energy has therefore figured prominently in India's energy strategy. This strategy is of great importance for the country and consists in creating global partnerships for the consolidation of the energy security of the country through cooperation, exploration and investment in renewable energy and its development. Coal and oil are responsible for over half of India's energy mix and plays a major role on the energy landscape. Traditionally, all these have been huge challenges not only because of a full dependence on fossil fuels but

also the high cost of import bill, risky geopolitics and degradation of the environment. To overcome these issues, the need of the hour forces India to reinvent its energy strategy placing higher emphasis on renewable energy sources, most prominently solar, wind, hydro and bioenergy.

The watershed moment in India's energy policy came in 2010, when the government launched the National Solar Mission under the broad National Action Plan on Climate Change. The targets of this initiative were ambitious and goal was to set base in India for the development of solar energy infrastructure to make the country a global leader in renewables. These efforts have built upon each other over the years to form a broader commitment to achieving 500 GW of renewable energy capacity by 2030, which was announced at the 2021 COP26 summit. But India's move to renewables is not only a sustainability transition, it is an economic one as well. Governments' supportive policies and incentives and falling costs of renewable technologies make the renewable energy to be a viable and attractive option.

2. GLOBAL PARTNERSHIPS AND INDIA'S RENEWABLE ENERGY GROWTH

India's ambitions on renewables cannot be met in isolation. Energy security in the process of transforming into clean energy needs to be secured through various kinds of international cooperation at technology transfer, investment, capacity building and policy harmonization. Aware of this, India has been proactively building international partnerships capitalizing on its status as a developing economy with significant potential towards renewable energy deployment.

3. INTERNATIONAL SOLAR ALLIANCE

The International Solar Alliance (ISA) is one of India's greatest contributions to world renewable energy diplomacy. The ISA was launched in 2015 at the COP21 summit in Paris as an initiative of India and France to bring countries in the Tropics together for adoption of solar energy. The alliance provides a platform for sharing best practices, attracting investment and spear heading innovative solution, to accelerate the deployment of solar energy in member countries.

India has positioned itself as a global leader in renewable energy helped by ISA. Around 100 member countries that face similar energy challenges have been brought together. The ISA has supported member countries with access to funding and reduced solar project investment risks through initiatives such as the Solar Risk Mitigation Initiative and the Affordable Finance at Scale program. This strategy is in line with India's strategy to be another hub of solar manufacturing and its exports, and further integrates the global energy security. Also included within this scope are innovative projects like the "One Sun, One World, One Grid" initiative. The vision behind this is ambitious to say the least, attempting to create a global interconnected solar energy grid where countries can share renewable energy resources in one complete energy ecosystem. This kind of project could dramatically improve energy access, cut costs, and improve energy resilience.

4. RENEWABLE ENERGY BILATERAL PARTNERSHIPS

India's bilateral engagements with the major global powers have catalysed India's renewable energy goals. As part of the U.S.-India Strategic Clean Energy Partnership, the two countries have co-developed programs to spur renewable energy deployment, increase grid resiliency, and speed adoption of electric vehicles. Transfer of technology including research collaboration has been enabled with the partnership in areas such as energy storage and advanced grid management. The US' collaboration with India was equally effective on solar and wind energy projects, and so has been the Indo-German Energy Forum between India and Germany. This proves that challenges of national level have to be addressed by leveraging the strengths of the global partners to meet the requirements of capacity scaling. India's renewable energy sector is further empowered by its involvement with Japan especially in hydrogen energy and energy efficiency. Together with joint research projects, Japanese investments in India's clean energy infrastructure have created new paths for clean energy solutions. However, partnerships with Nordic countries like Denmark have acted as an open cart the technological wind energy amongst India, especially in the offshore wind projects.

5. SOUTH-SOUTH COLLABORATION AND REGIONAL COOPERATION

In the SAARC, India has been able to use one platform to partner with its neighbors to develop renewable energy initiatives. Energy disparities and the opportunity for collective energy security in the region can be addressed by

projects like cross border energy trade and regional solar grids. Another cornerstone of India's renewable energy diplomacy is partnerships with India's African partners. Not only they reinforce India's relationship with African nations, they help global sustainable development. Additionally, India's leadership in renewable energy has included partnerships with small island developing states (SIDS) in the Pacific and Caribbean, to address energy challenges in these regions. Renewable energy systems development in these regions enhances the clean energy supply and the resilience against climate change impact by reducing their dependence on fuel imports.

6. GLOBAL ADVOCACY AND MULTILATERAL ENGAGEMENTS

India, a member of G20 has been a constant advocate of including renewable energy in the global energy agenda. During its 2023 G20 presidency, India stressed the importance of inclusive energy transition, and pointed out that international cooperation is key to global energy security. Further, India's engagement with the International Renewable Energy Agency (IRENA) and the Clean Energy Ministerial has made its position on support for renewable energy even more strongly manifest. As a result, India has coordinated with international partners to craft a common platform to frame energy policy, share knowledge, and steer investments to bankroll clean energy projects. India has been very active in the United Nations Framework Convention on Climate Change (UNFCCC) and has pushed hard for a larger role from the developed world to help developing countries cope with climate change. It is aligned with India's larger climate pledges like becoming net zero by 2070 and drastically reducing the carbon intensity of its economy.

7. PUBLIC-PRIVATE PARTNERSHIPS

The importance of the private sector to India's experience in renewable energy can hardly be overstated. Indian companies have been able to enter foreign markets, technologies and financing, to the benefit of the country's renewable energy sector through global partnerships. Many of these projects are scaled up with funding from global firms and financial institutions, through collaborations with companies such as Tata Power, ReNew Power and Adani Green Energy. It also has shown that public private partnerships (PPPs) have become a crucial means of resource mobilization and expertise. India and Norway India and India and UAE have formed Collaborative projects like India Norway Green Hydrogen Taskforce and India UAE Renewable energy partnership which shows how PPPS can be used to deal with complex issues to bring out sustainable energy solutions.

8. CAPACITY BUILDING AND TECHNOLOGY TRANSFER

Transfer of advanced technology to India is among the most important benefits of global partnerships in renewable energy. Renewable energy has become cheaper, more cost effective because of cutting edge innovations in solar panels, wind turbines and energy storage systems. Working in partnership with countries such as Denmark and the Netherlands, India has developed futuristic wind energy technologies which paved the way for tapping India's large offshore wind potential. Another key area for where global partnerships had made advancements is capacity building. The Indian professionals have been trained, maintained and sustained with the skills and knowledge required to manage and sustain the renewable energy systems through training programs, exchange initiatives and collaborative research projects. These efforts contribute to India's sustainability in long run in terms of energy transition and that it continues to stay in the forefront of global renewable energy development.

9. CHALLENGES AND ENSURING INCLUSIVITY

Nevertheless, global partnerships have brought a quantum improvement in India's renewable energy policy. The deployment of renewable energy always poses a problem regarding financing, especially for the developing countries such as India. This is true despite the fact that international something renewable energy frameworks are supported for the reason that the expensive costs of the renewable energy infrastructure hinders investment. To this end, India needs to explore how to leverage relevant international cooperation to design new sources of funding like green bonds and blended finance instruments. Another challenge is the connectivity of renewable energy to the existing grid development. If India is to ramp up RE generation capacities more such issues pertaining to grid stability and energy storage comes into play. The Assemblies can obtain the technical know-how for these challenges in cooperation with international partners; they can also mobilise the necessary investment. Another factor is sensitivity to difference, or simply the ability

to be 'colour-blind'. Different factors such as social equity in the utilization of renewable energy projects should also be considered for the successes of energy transition in India. Engagement with organizations of global standing and civil society will enable India formulate and share policies that create harmony and sustainability.

10. CONCLUSION

In the process of achieving energy security for India, foreign collaborations shall continue to be a major focus of the country's renewable energy policy. Its active participation in the international relations shows that the country is ready to solve global problems while working on its own interest. This way, India not only enhances its energy residency but also helps to fight global climate change. It has become clear that more work will have to be done in order to strengthen existing relations, seek new opportunities for cooperation, and/or ensure that national practices conform to international standards. India benefited in the past from multilateralism and it continues to play an active role in shaping new initiatives like the ISA and attending other international conferences actively. Renewable energy diplomacy will, therefore, be critical for India as the world transit to a low carbon intensity future for a secure, sustainable and inclusive energy architecture. Here, India has to maintain the advantage it enjoys as a developing country that can generate a large quantum of renewable power. This way, India targets can be aligned with global goals, thereby putting forward its energy transformation process as a successful example of an effective international cooperation and innovative activities in the pursuit of energy security and sustainability.

CONFLICT OF INTERESTS

None.

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