



The Green Grids Initiative

A Must for India to Reach Net-Zero?

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Issue Brief

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ABSTRACT

This paper aims to provide an overview of the Green Grids Initiative, focusing on the implementation, benefits, and drawbacks of the initiative in India. It introduces COP26 as a concept and the various agreements in the energy sector, followed by the history and the goals of the initiative, the implementation of the initiative, and the challenges and opportunities of the initiative with India as the focus. The piece concludes with suggestions on issues that need to be addressed before the initiative is implemented properly.

Keywords: Energy transition, solar energy, interconnectivity, solar energy infrastructure, emissions

INTRODUCTION: TAKING OFF FROM COP26

The United Nations Climate Change Conference [COP26] in Glasgow saw the participation of over 120 world leaders, 40,000 registered participants, 22,744 political party members, 14,000 observers, and over 3,800 media representatives. This UK-Italy led conference promoted discussions on climate change issues and solutions which resulted in the Glasgow Climate Pact (United Nations, n.d.). The pact includes commitments to strengthen efforts to build climate resilience and curb the emission of greenhouse gases.

The conference called for participation from nations to accelerate their transition from coal and fossil fuels to clean power. This was significant since the energy sector accounts for more than a quarter of global greenhouse gas emissions. Suggestions proposed that developed countries and developing countries phase out coal by 2030 and 2040, respectively, and urged nations to cease the construction of new thermal power plants (UN Climate Change Conference, n.d.).

Based on such suggestions and deliberations of COP26, Prime Minister Modi announced India's Panchamrit to combat climate change and accelerate the energy transition in India. As Yadav (2021) summarises, India's revised commitments include the following goals:

1. Increasing India's non-fossil energy capacity to 500GW by 2030;
2. Bringing down the Indian economy's carbon intensity below 45% by 2030;
3. Fulfilling 50% of the country's energy requirements through renewable energy by 2030;
4. Reducing India's total carbon emissions by 1 billion tonnes from the total projected emissions by 2030; and
5. Achieving net-zero emissions by 2070.

Under the International Solar Alliance [ISA], India further announced the launch of the Green Grids Initiative - One Sun, One World, One Grid [GGI-OSOWOG] in partnership with the United Kingdom. The OSOWOG envisions financial, technological, and research cooperation to facilitate cross-border renewable energy transfer projects (ibid.). The initiative, however, comes with its set of opportunities and obstacles.

THE CONCEPTION OF THE GREEN GRIDS INITIATIVE

GGI-OSOWOG was conceived in 2018 as a plan to develop global interconnected solar energy systems. Australia, France, India, the United Kingdom, and the United States of America formed a steering committee to spearhead the initiative. This committee planned out the preliminary technical studies in 3 phases. In 2020, a consortium of experts was onboarded the initiative by the committee to conduct technical studies, along with several other nations endorsing the initiative (International Solar Alliance, n.d.). In May 2021, India and the United Kingdom formally committed to launching the GGI at COP26 (Climate Parliament, 2021).

With 92 nations endorsing the initiative, GGI-OSOWOG's implementation was introduced at COP26

based on three key pillars: political engagement, institutional engagement, and research and knowledge sharing (International Solar Alliance, n.d.). The initiative aims to build a framework for global cooperation on the effective utilisation of renewable resources and to help ensure that clean and efficient energy is a reliable option for all nations to meet their energy requirements by 2030. This project aspires to fully harness the sun's energy and build an interconnected electricity grid across the globe to accelerate the transition to renewable energy (Hussain, 2022).

IMPLEMENTATION OF THE GREEN GRIDS INITIATIVE

The venture onboarded legislators, research institutions, power system operators, and international financial and technical organisations from different nations to expedite the construction of new infrastructure. The planned infrastructure aims at improving renewable energy generation capacity in energy-rich locations, connected by smart continental grids consisting of millions of solar panels and charging stations for electric vehicles. Provisions will also be made to develop micro-grids for rural communities, ensuring a steady power supply during extreme weather conditions (Climate Parliament, 2021).

The development of the grids will take place in three stages. First is the interconnection of the Indian grids with the Middle East, South Asia and Southeast Asian [MESASEA] grids. Second, MESASEA grids' interconnection with the African power grid. And finally, global interconnectivity (International Solar Alliance, 2021). The initiative is expected to connect more than 80 countries across a large geographical area with varying levels of sunlight. A transitional system will enable countries with low levels of sunlight to obtain energy from areas with an excess of it (Hussain, 2022).

In the long term, the initiative is also expected to engage in other solar projects with expert help in the field, increase investments in renewable energy, and create a substantial number of green jobs that contribute toward preserving or restoring the environment (International Solar Alliance, n.d.; International Labour Organization, 2016).

CHALLENGES AND OPPORTUNITIES OF THE GREEN GRIDS INITIATIVE IN INDIA

Being a thermal energy-dependent country, India produces most of its energy by burning coal. Renewable energy, more importantly, solar energy, has the potential to solve India's longstanding energy challenges (Sharma et al., 2012). With the nation committing to reducing its carbon intensity and bringing down its non-fossil energy capacity by 2030, the proper implementation of the GGI in India is of paramount importance.

To reach net-zero by 2070, India requires 5,600GW of solar energy capacity, which is 11 times more than what has been pledged to achieve by 2030 (CEEW, 2021). Achieving this capacity would generally require considerable investments in solar batteries and other related technologies. The Green Grids Initiative helps bypass this requirement for investments since it would drastically reduce the operating costs of the storage and integration of solar energy. The initiative would provide a com-

bined pool of solar batteries for all the nations involved.

Currently, India faces severe electricity shortages in many areas due to constant heatwaves and coal shortages (Times of India, 2022). Here GGI can completely transform the traditional energy system by replacing thermal power plants with solar energy, making India more resilient against extreme weather conditions and less dependent on fossil fuels. In the last few years, solar energy has been improving the lives of millions of people in rural India, enabling them to carry out activities and improving their standard of living in an environmentally friendly manner. An example of this is the implementation of solar-powered agriculture pumps to extract groundwater. These agriculture pumps are more environmentally friendly than the traditional diesel ones. The number of diesel pumps in India stands at around 1 crore. However, it is estimated that the replacement of 10 lakh diesel pumps with solar-powered pumps can improve agricultural output by Rs. 30,000 crores while also mitigating diesel usage. The proper implementation of the GGI can enhance the quality of life of rural communities in many other areas like access to electronic gadgets, clean drinking water, etc. (The Hindu Business Line, 2016; MNRE, n.d.).

However, certain obstacles need to be considered during the implementation of the initiative. Its documentation does not comment on improving the efficiency of the existing solar energy infrastructure in the country. Another challenge is that a majority of the solar energy infrastructure is located in arid and desert regions, which brings dust deposits on solar panels. A layer of dust decreases solar power conversion efficiency by 40% (Sharma et al., 2012). Furthermore, there is a hidden environmental cost of setting up solar energy infrastructure. Solar energy technologies such as batteries and panels use energy-intensive raw materials and several chemicals and heavy metals that need to be handled and disposed of correctly. In a country like India, where the problem of e-waste and industrial discharge in rivers is at an all-time high, proper waste management mechanisms are necessary to reduce the environmental stress, primarily caused by an increase in solar energy infrastructure.

The initiative also does not define strategies to properly recycle and repurpose existing infrastructure, which can be an exciting avenue to view through the circular economy lens. Since 2011, solar power capacity worldwide has been growing by 70GW per year. Solar panels generally have a lifespan of 25 years, after which they have to be retired since they lose their efficiency and become unprofitable. According to these trends, it is estimated that 2.8 crores panels will have to be decommissioned every year, starting in 2026 (ET Energy World, 2022). Most of these panels will be disposed of in landfills, drawing severe environmental repercussions. Therefore, developing a system that encourages the repair, reuse, and recycling of existing solar panels is essential.

IS THE GREEN GRIDS INITIATIVE THE RIGHT WAY FORWARD?

With the GGI aiming to connect countries over a large geographical area to enable the sharing of solar energy, a lot needs to be reconsidered before the initiative is implemented. Environmental costs of solar power, efficiency issues, energy losses due to conversion and transfer, and the problem of waste management are barriers that need to be addressed urgently by the implementing bodies. Specifically, in India, the implementation of the GGI comes at an increased environmental cost due to waste disposal issues. These obstacles need to be worked around by developing specific systems to reuse and recycle existing infrastructure. Even though India is spearheading the initiative, there have been no indications of country-specific plans to enable a smooth transition from traditional

energy systems to solar energy and improve energy conversion efficiency. To make the initiative a success in India, there needs to be a careful consideration of the initiative's costs and the benefits. Its modifications need to be planned in ways that suit the country's requirements and resource capabilities.

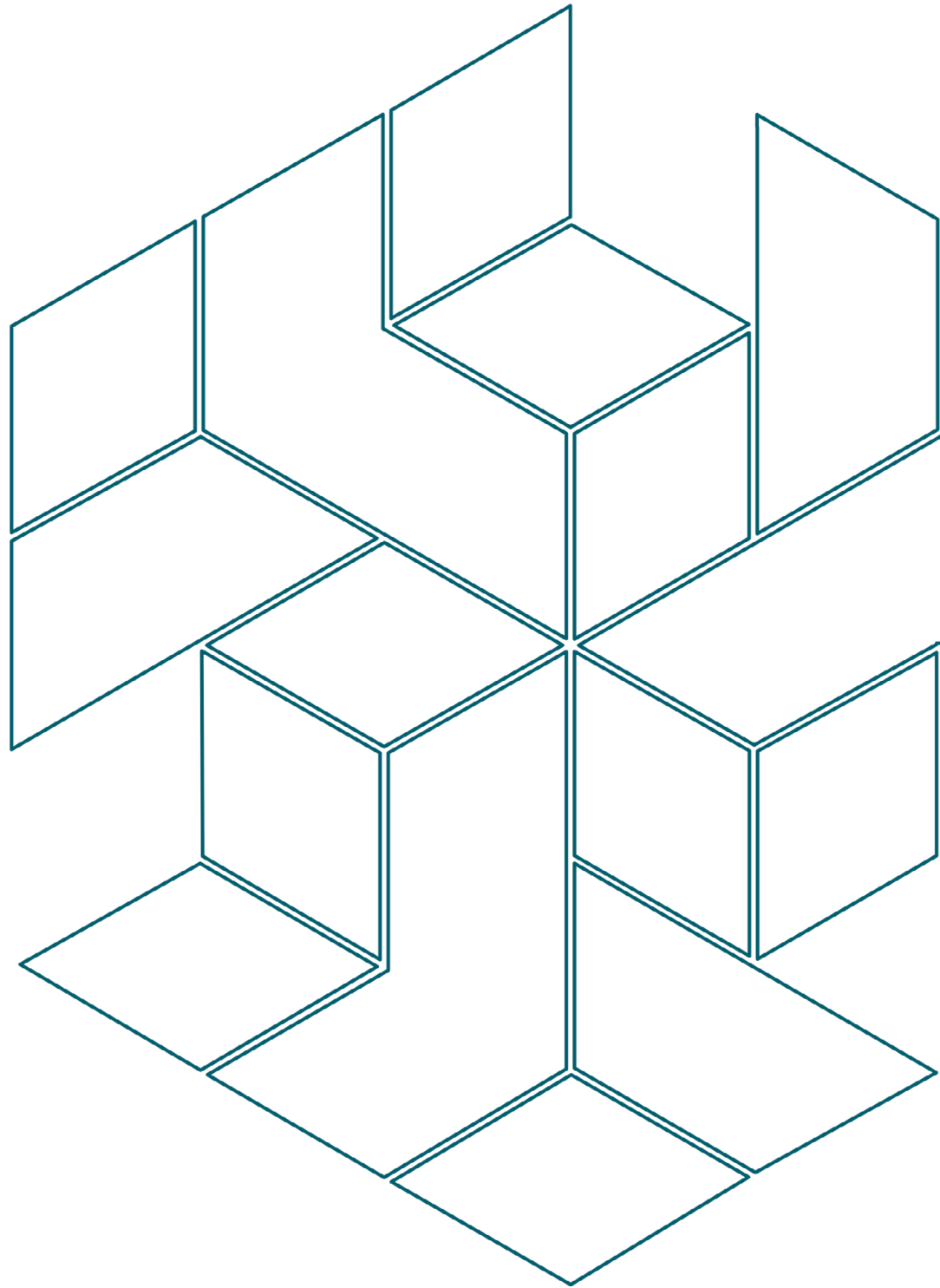
The initiative has opened many opportunities for India to put itself on the global stage of renewable energy. With the recent coal shortage serving as a reality check alongside the global race to Net Zero, India's transition to renewable energy should be expedited. The GGI serves as a good starting point for the same, provided the nation overcomes the aforementioned challenges and considers the environmental costs of implementing the initiative.

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