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One Sun One World One Grid: Prospects, Challenges and A Possible Alternative For OBOR

Dr Md. Mushfique Alam*, Mr. Abhishek Kumar**
**Associate professor,Department of political science,T N B College, Bhagalpur (Bihar)*
***JRF(UGC), Department of Political Science, T M B University, Bhagalpur (Bihar)*

Abstract: - The concept of One Sun, One World, One Grid was presented at the first meeting of the International Solar Alliance (ISA) organized by the Indian Prime Minister in the year 2018. Under this program, efforts will be made to balance the energy sharing and energy supply between different countries through the establishment of interconnected 'Green Grids' at regional and global levels. At present, most of the emissions from power generating units across the world cause extensive damages to the environment. Also, setting up and operating power plants is extremely expensive, making energy supply a major challenge for many Least Developed Countries. It is very important to move towards renewable energy sources like solar energy to reduce the damage to the environment from non-renewable energy sources, but setting up large scale solar power plants will be a big challenge given the current energy needs. So, this paper also aims to analyse different aspects of proposed initiative along with quest for possible challenges associated with it. Bilateral relations between India and China is going through tough times and China is relying heavily on its ambitious project One Belt One Road. Therefore, this paper also delves into the possibilities of countering that through the One Sun, One World, One Grid.

Key words: - One Sun One World One Grid, One Belt One Road, International Solar Alliance, India, China, Solar Energy, Renewable Energy

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I. INTRODUCTION: -

With renewable energy achieving grid parity in different countries, it has triggered accelerated large-scale deployment worldwide. Renewable energy can also help to achieve an economical energy transition provided its distributed nature, intermittency and demand supply mismatch are addressed in a timely, geographically coordinated and an effective manner. A larger grid-based interconnectivity across geographies, which lays emphasis on the 'One World One Grid' concept has the potential to overcome these challenges. It can also help the world in the transition process to move towards clean energy in a sustainable manner. Recently, the Government of India has called for bids to roll-out the 'One Sun One World One Grid' (OSOWOG) plan(Bhaskar, 2020). The plan focuses on a framework for facilitating global cooperation, building a global ecosystem of interconnected renewable energy resources (mainly solar energy) that can be seamlessly shared. A long-term approach, implementation plan, road map and development of institutional framework by the 'Union Ministry of New and Renewable Energy' for its ' One Sun One World One Grid (OSOWOG) program Proposals have been sought from interested companies (PIB, 2018). 'OSOWOG' through all the countries of the world were called to work together. The objective of this program is to establish a global ecosystem by connecting renewable energy sources located in different countries.

Objectives: -

1. To understand the need of OSOWOG initiative
2. To find its prospects for India
3. To spot the issues and challenges associated with OSOWOG
4. To analyse the strategic importance of OSOWOG for India
5. To envision any possibility of OSOWOGcounteringOBOR

Background: -

The global energy demand was rose by 4% in 2018 and 1.9% in 2019.(Outlook, 2019). Currently most of the countries of the world depend on non-renewable energy sources for their energy needs. Power generation plants have a 42% role in CO2 emissions related to energy sector globally. India derives more than 50% of its total energy requirement from coal-fired power plants, while renewable sources account for about 23% of the

power generation in India. The Government of India has set a target of increasing solar power generation in the country to 175 GW by 2022(IEA, 2020).

Energy Crisis in India: -

An energy crisis is a bottleneck in the supply of energy resources to an economy. In other words, it refers to one of the energy sources used at a certain time and place, in particular, those that supply national electricity grids or those used as fuel in vehicles. Industrial development and population growth have led to a surge in the global demand for energy in recent years. In India, we rely too much on thermal energy to satisfy our energy requirements. This has come up with an environmental cost from air pollution to climate change. To address the issue, it is imperative to diversify our source and renewable energy should add to our arsenal in great proportion. Currently, Coal supply by Coal India Ltd is restricted to around 65% of actual coal requirement by coal-based thermal plants, leading to increased dependence on imported coal(PTI, 2020).This results in increasing power generation costs due to limited fuel availability. Increasing operational inefficiencies and outstanding debts have led to poor financial health of state discoms. As per the estimates of Planning Commission, to ensure a sustained 8% growth of the economy, by 2031-32, India needs to increase its primary energy supply by three to four times and its electricity generation by five to six times of the 2003-04 levels(Kohli, 2016).

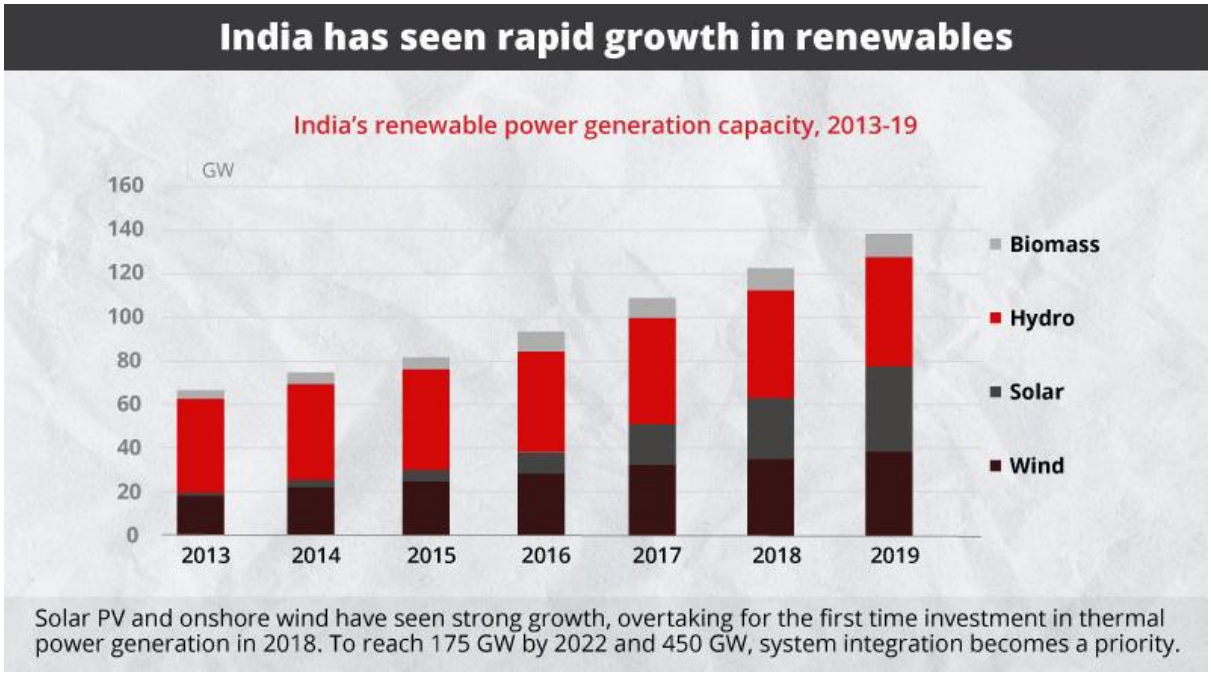

Fig 1. India's renewable power generation capacity, **Source- india.mongabay.com**

That's why, Energy-efficiency is extremely important and can be promoted by setting appropriate prices and this is particularly important where energy prices are rising. However, appropriate prices by themselves may not suffice and non-price incentives/disincentives are therefore also required. There is a need for alternate energy, which will not only offset the demand of conventional fossil fuel, but also pave way to cleaner solutions. Hence, a green growth economy is the need of the hour. India also plans to set up the World Solar Bank (WSB)with the capital of USD 10 billion and India may become the lead member by taking a 30% stake in WSB, requiring a $3 billion commitment. ISA' strategic goal includes mobilizing $1 trillion and reducing the cost of finance and technology(Bhaskar, India steps on the gas to set up World Solar Bank, may take up 30% equity, 2020).

The bank will help in setting up solar projects in member countries and it aims to disperse $500 billion over 10 years. In this way, it will act as a concrete financial instrument of International Solar Alliance. Setting up the WSB may require a total equity capital of $10 billion, a committed capital of $8 billion, and a paid-up capital of $2 billion. This will help in mobilising debt to the tune of around seven times the equity value. The idea being explored by ISA may also involve co-financing solar projects with other multilateral development banks and initially support sovereign guarantee backed solar projects in member countries(Bhaskar, India steps on the gas to set up World Solar Bank, may take up 30% equity, 2020).The proposal for a World Solar Bank comes against the backdrop of ISA's mission to undertake joint efforts required to reduce the cost of finance and the cost of technology, mobilise more than $1,000 billion of investments needed by 2030 for massive

deployment of solar energy, and pave the way for future technologies. It will help to mitigate the effects of US withdrawal from Paris climate deal by providing clean and renewable energy.

One Sun One World One Grid: -

India's Prime Minister recently called for connecting solar energy supply across borders, with the mantra of 'One Sun One World One Grid' (OSOWOG). The vision behind the OSOWOGmantra is "The Sun Never Sets" and is a constant at some geographical location, globally, at any given point of time. With India at the fulcrum, the solar spectrum can easily be divided into two broad zones viz. far East which would include countries like Myanmar, Vietnam, Thailand, Lao, Cambodia etc. and far West which would cover the Middle East and the Africa Region(Bhaskar, India invites bid for One Sun One World One Grid to take on China's Belt and Road Initiative, 2020).The Ministry of New and Renewable Energy (MNRE), Government of India, has a critical role to play in synergizing over 140 countries, across the far east and the far west regions, to build consensus, launch energy policy imperatives and set up a framework for such a global cooperation.

India, through the OSOWOG initiative, plans to take another leap towards building a global ecosystem of interconnected renewable energy resources that are seamlessly shared for mutual benefits and global sustainability. The initiative is planned across three phases:

- **Phase I (Middle East-South Asia-South East Asia (MESASEA) interconnection):**

Indian Grid interconnection with Middle East, South Asia and South East Asian grids
to share solar and other renewable energy resources for meeting electricity needs including peak demand. For this purpose, an assessment shall be made of renewable energy potential of all countries in these regions and a pertinent study would be carried out, so as to ascertain, how they can share their renewable energy resources with each other for meeting their electricity demand including peak demand and also for rationalizing their tariffs.

- **Phase II (Solar and other Renewable Energy resources rich regions 'interconnection):**

MESASEA grid getting interconnected with the African power pools to share solar and other renewable energy power of the countries located in solar and renewable energy rich areas.

- **Phase III (Global interconnection)**: to achieve the One Sun One World One Grid vision(MONRE, 2020)

An interconnected grid would help all the participating entities in attracting investments in renewable energy sources as well as utilizing skills, technology and finances. Resulting economic benefits would positively impact poverty alleviation and support in mitigating water, sanitation, food and other socioeconomic challenges. Further, the proposed integration would lead to reduced project costs, higher efficiencies and increased asset utilization for all the participating entities.

Prospects for India: -

- **Parity with Great Powers-** This ambitious project can put India alongside other major powers and their super grid projects such as China's Global energy interconnection project, Europe's gold standard power tools. Not only that, OSOWOG will provide an opportunity for India to move on to the centre stage globally. The world is going through a global climate Crisis and this kind of initiative will certainly accelerate the decarbonisation process in energy production.
- **Climate Mitigation-** The world is still struggling to implement the Paris climate deal. United States of America has already withdrawn from that. In these circumstances, OSOWOG project can be seen as important project. Also,OSOWOG will have to mitigate its effect on climate by providing clean and renewable energy resources. It will also give chance to the enabling member countries to fulfil their nationally determined contributions (NDC) towards reducing global warming with the help of this project.
- **Bridging Current Account Deficit:** - India is currently importing around 250 million of fossil fuel including oil, diesel, LNG, coking coal and thermal coal(ETEnergyWorld, 2020). With the help of this Supergrid, India can certainly look to bridge its current account deficit by supplying cleaner energy to other countries.
- **Continuous power supply**- Through OSOWOG, 24x7 power supply can be ensured by connecting the grids of different countries. The problem can be overcome by sharing the additional energy produced by connecting the energy grid is located on different countries of the world. The supply of energy will be ensured at a low cost through solar energy.
- **Collective Ownership**- The OSOWOG program is based on the values of participation and collective ownership, where all members have collective rights. Under the OSOWOG program, member countries will work together on this system to share renewable energy, thereby improving relations between these countries and also enhancing cooperation in other areas in the future.
- **Opportunities for Employment**- Currently, about 11 million people are employed in the renewable energy sector worldwide, while the role of the renewable energy sector in the total energy production of the

world is very less, so with the expansion of renewable energy sources a large number of jobs in this sector Opportunities will be made available.

- **India in the Leadership Role-** Through this program, for the first time India has become part of the solution rather than being part of the global problem. Under this program, it has been said to connect the countries of Asia and Africa further, on a larger scale, these countries are full of diversity and potential in many areas. But the energy crisis has also been the most serious in these countries, which is the biggest obstacle in their path of development. India has presented an example of its leadership potential to the world through OSOWOG to address the current global energy crisis.

Possible Counter for OBOR: -

The violent clash on the Indo-China border on the night of fifteen-sixteen June has brought India and China to the cusp of confrontation. The Aspirations of China and its current leadership have made the normalisation process a distant possibility. This tension between China and India has been interpreted in many ways. Some analysts are looking for its roots in China's One Belt and Road Initiative (OBOR), an ambitious project to expand its investment around the world. Under this plan, China wants to lay a network of roads and ports in Asia and Europe, so that the goods of China can be transported to the world markets. Many countries of the world have come with China in this project, but India has been opposing it since the beginning. China has made diplomatic efforts to include India, which has failed. Professor Muktar Khan of Delaware University of America believes that this ambitious project of China may also be a reason for the latest dispute between India and China. At the same time, Swaran Singh, professor and China affairs expert at Delhi's Jawaharlal Nehru University, believes that China wants to protect its investment at any cost, but India stands as a challenge to China's OBOR. He further says- "The economic growth that has taken place in China in the last 40 years has been due to its international trade and now China wants to become the world's biggest businessman as well as an investor. That's why China has grown keeping the thinking in mind, started the Belt and Road Initiative(BBC, 2020). "

Now, OWOSOG is being seen as an alternative for OBOR. OSOWOG will provide a strategic rebalance in favour of India and will combat the increasing Chinese dominance in Asian subcontinent, providing a better alternative to developing countries.OSOWOG will provide India a chance to counter China's aggression in South Asian region. OSOWOG is based on the values of mutual cooperation and sustainable development, different from China's 'One Belt One Road- OBOR'. The establishment of ' World Solar Bank' (World Solar Bank-WSB) is being considered by India in view of the financial challenges for successful implementation of OSOWOG.WSB aims to compete with other newly created funding institutions like the Asian Infrastructure Investment Bank (AIIB) and the New Development Bank (NDB). The financial challenges will be reduced to some extent by managing US $ 50 billion annually for OSOWOG in collaboration with WSB and World Bank. If India can manage to bring other countries together and work on ground level in efficient manner, it can be a highly successful idea.

Current challenges related to energy: -

Most of the prevalent emissions from most of the power generating units globally cause extensive damage to the environment. Also, setting up and operating power plants is extremely expensive, making energy supply a major challenge for many Least Developed Countries. At present, the biggest challenge related to solar energy is to set up a large-scale battery or other system related to energy conservation to collect the energy received during the day. Solar power can only be obtained during the daytime, which limits the goal of its sustainable supply. It is very important to move towards renewable energy sources like solar energy to reduce the damage to the environment from non-renewable energy sources, but setting up large scale solar power plants will be a big challenge given the current energy needs.

Presently, mineral oil and other non-renewable energy sources not only meet the energy needs, but also have strong interventions in the energy market worldwide. In such a situation, the promotion of solar energy will affect the already established economic system in the energy sector, due to which the people connected with it can directly or indirectly oppose the projects related to solar energy.

II. CONCLUSION: -

Although the Project is yet to be implemented on ground level, it has enormous potential. Whole world is struggling with the pandemic and stringent environmental norms are really necessary to maintain in order to protect the world from natural disasters in future. OSOWOG can certainly help in that. It will promote environment friendly energy production. On contrary to China's OBOR, it is transparent in nature. The kind of transparency that has been kept by India in the context of this scheme so far will continue to get support even further globally. Promoting renewable energy through OSOWOG will achieve the goal of energy sustainability across international borders. The successful implementation of OSOWOG will help in reducing the current

energy challenges of the world and provide a big strategic edge to India globally. The move is the key to future renewable-based energy systems globally because regional and international interconnected green grids can enable sharing and balancing of renewable energy across international borders. Itwill further allow grabbing opportunities to learn quickly from global developments and share renewable energy resources to reduce the global carbon footprint and insulate the societies from pandemics.

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