Green Grids Initiative

For Prelims: Green Grid Initiative, One Sun One World One Grid, Solar Energy, Solar Panel, Solar Pumps, COP, Renewable Sector, ISA, Climate Change, Clean Energy, Heatwaves

For Mains: India's initiatives to promote renewable energy, Significance of Global Groupings on economy of country, Challenges and opportunities in OSOWOG

Why in News?

India and UK, jointly announced a declaration on "one sun, one world, one grid" — or OSOWOG at the **Conference of Parties (COP26),** held in Glasgow, UK.

What do we know about OSOWOG?

- **About:**
  - GGI-OSOWOG was **conceived in 2018** to develop **global interconnected solar energy systems.**
    - Under the **International Solar Alliance**, India announced the launch of the **Green Grids Initiative — One Sun, One World, One Grid (GGI-OSOWOG)** in partnership with the United Kingdom.
- **Objectives:**
  - The vision behind the OSOWOG is **'The Sun Never Sets'** and is a constant at some geographical location, globally, at any given point of time.
  - 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 **harness the sun's energy and build a global interconnected electricity grid** to accelerate the transition to **renewable energy.**
  - 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.
- **Stages of Grid Connection:**
  - The interconnection of the **Indian grids with the Middle East, South Asia and Southeast Asian (MESASEA)** grids.
  - MESASEA grids' interconnection with the **African power grid.**
  - Finally, **global interconnectivity.**

What is the Importance of GGI OSOWOG?

- It will bring more **technical, financial and research cooperation** to help facilitate **cross-border renewable energy transfer projects,** which will give OSOWOG its global infrastructure.
- It will also create a depth of **organizational scale, spanning national governments, international financial and technical organisations, legislators, power system operators and knowledge leaders,** to accelerate the construction of the new infrastructure needed for a

world powered by **clean energy.**

- It will enable a faster leap towards a **global ecosystem of interconnected renewables** that are shared for mutual benefit and global sustainability.
- It will provide **momentum, and a pool of investment towards** low-carbon**,** innovative solar projects, and bring together skilled workers for a **solar-powered** economic recovery. It can also propel investment and create millions of new green jobs.
- It will lead to **reduced project costs, higher efficiencies and increased asset utilization** for all the participating entities.
- It will result in **economic benefits, positively impact poverty alleviation and support in mitigating water, sanitation, food and other socio-economic challenges.**
- Allow **national renewable energy management centres in India** to grow as regional and global management centres.

What are the Challenges & Opportunities in GGI OSOWOG for India?

- **Challenges:**
  - Documentation of GGI **does not comment on improving the efficiency of the existing solar energy infrastructure in the country.**
  - The majority of the solar energy infrastructure is located in **desert regions,** which brings dust deposits on panels.
    - A layer of dust **decreases solar power conversion efficiency by 40%.**
  - 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.
  - It does not define strategies to **recycle and repurpose existing infrastructure,** which can be an exciting avenue to view through the **circular economy** lens.
  - Solar panels **generally have a lifespan of 25 years**, after which they have to be retired since they lose their efficiency.
- **Opportunities:**
  - Being a **thermal energy-dependent country,** India faces **severe** electricity shortages in many areas due to **heatwaves** (when demand increases) and coal shortages.
    - GGI can **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.
  - 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** (PM-KUSUM) **to extract groundwater,** which are more environmentally friendly than traditional diesel ones.
      - The number of diesel pumps in India is 10 million.
      - It is estimated that the replacement of 1 million diesel pumps with solar-powered pumps can improve agricultural output by Rs 30,000 crore, while also mitigating diesel usage.
    - The implementation of GGI can **enhance the quality of life of rural communities** in many other areas like access to electronic gadgets, clean drinking water, among others.

Way Forward

- 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.**
- In India, the implementation of 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.**
- 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.
- **Institution building** is key to fulfilling the ambitions of a multi-country grid project.
    - In this context, **ISA (International Solar Alliance)** can act as an independent supranational institution to take decisions about how the grid should be run and conflicts settled.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q With reference to solar water pumps, consider the following statements: (2020)

1. Solar power can be used for running surface pumps and not for submersible pumps.
2. Solar power can be used for running centrifugal pumps and not the ones with piston.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Ans: (d)

Explanation:

- The main components in a solar pumping system include a photovoltaic (PV) array, an electric motor and a pump.
- There are several different types of solar-powered pumps depending on their functional mechanism. But primarily there are four types of solar water pumps - submersible pumps, surface pumps, direct current (DC) pumps and alternate current (AC) pumps. **Hence, statement 1 is not correct.**
- Solar Power can be used to run both centrifugal as well as piston pumps. **Hence, statement 2 is not correct.**
- **Therefore, option (d) is the correct answer.**

Source: DTE