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# SELF RELIANCE IN ENERGY

## MOST IMPORTANT NOTES FOR MAINS



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**GS 3 INDIAN ECONOMY**

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## **SELF RELIANCE IN ENERGY**

India has made great progress in the past decade in terms of production, distribution and access to energy. About 900 million people have already gained access to electricity in the last two decades. But, the per capita electricity consumption in India is only one-third of the global average, even though the demand for energy has doubled. So, to catch up with the increasing demand for energy, there is a need to make arrangements for a secure and sustainable form of self-reliance in the energy sector.

### **NEED FOR SELF RELIANCE IN ENERGY SECTOR**

- Heavy dependence on import: At present **75% of India's Oil and Gas needs are met through imports**. This might **rise to 90% by 2040** according to IEA's Energy Outlook 2021.
- Limited availability of resources like fossil fuel: India's energy mix is skewed towards fossil fuels. 75% of India's energy in 2020 was supplied by Coal (44%), Oil (25%) and Natural Gas (6%). With limited reserves of Oil and Natural Gas, securing long term supply of Oil and Natural Gas remains a challenge.
- **Import dependence has associated Geopolitical risks** which exposes the economy to **external shocks** (e.g., Political instability in the Middle East, or threat to global oil supply chain makes India's energy security vulnerable).
- High import bill and Current Account Deficit hampers countries credit rating and fiscal stability.
- Energy Security of the country and to meet countries growing energy demand.
- To fulfil India's commitment towards global climate conference under Paris Agreement.

## **RENEWABLE ENERGY FOR SELF RELIANCE IN ENERGY**

- Self-reliance through green energy initiatives is the **foundation of a green and sustainable economy**. Green energy initiatives focus on clean energy and its availability to all individuals and businesses.
- The renewable sector is projected to attract investment worth USD 80 billion in the next couple of years. Further, it is estimated that 49% of total electricity will be generated by renewable energy by 2040.
- Considering the scarcity of fossil fuels and resultant carbon emissions, renewable energy is the future energy and will mitigate the energy crisis of India and will provide sustainable and affordable energy to its citizens.
- **India can achieve Sustainable Development Goals (SDGs)** only when **Social, Economic, and Environmental (SEE)** dimensions are addressed in a balanced and sustainable manner.
- Out of 17 SDGs, five SDGs are highly linked, and three SDGs are moderately associated with Renewable Energy. So, by achieving self-reliance in the energy sector, India can achieve many SDGs.
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## **BENEFITS OF RENEWABLE ENERGY**

- The increasing importance of renewable capacity will shift India's power system from the dominance of coal to renewables and thereby open up the window for a green and clean gas-based economy.
- Increasing the use of renewable energies will lead to low dependency on fossil fuels, which will in turn help in decarbonisation. This will help in creating a better environment with less pollution.
- Usage of renewables will help in producing eco-friendly energy which will make India energy secure and energy independent.
- It will help in exports that will increase countries' foreign exchange earnings and strengthen India's global positioning.

## **CHALLENGES WITH RENEWABLE ENERGY**

- The major challenges are
  - Affordability for consumers,
  - Financial stability of DISCOMS (Distribution Companies),
  - Integration issues,
  - Gaps or barriers in regulatory and market frameworks,
  - Uncertain cost-benefit outcomes,
  - Issues in power system flexibility, etc.
- Apart from that, the share of penetration of renewable energy is highly variable and skewed.
  - For instance, States like Tamil Nadu, Rajasthan, Gujarat, Karnataka, Andhra Pradesh, Madhya Pradesh, Maharashtra, Telangana, Punjab, and Kerala contribute 97% of total solar and wind energy. They also have advanced power sector development compared to the rest of the country.

## GOVERNMENT INITIATIVES

- India is one of the leaders in the production of renewable energy and is playing a valuable role in contributing to a global green economy. Renewables including solar, wind, hydro, biofuels, and green hydrogen are the major sources of energy that lead to a low-carbon economy.
- Recently, the Government of India has set up the Ministry of New and Renewable Energy (MNRE) to promote renewable energy and set a target to attain the capacity of 227 GW by 2022. This includes 114 GW from solar, 67 GW from wind, and the rest from others like bio and hydro energy.
- **Solar:**
  - The government is providing subsidies and other incentives to enhance the capacity of 'Rooftop Solar Energy'.
  - PM KUSUM and 'Atal Jyoti Yojana (AJAY)' aim to provide solar pumps and grid-connected solar and Solar LED Lights respectively.
  - Due to these initiatives, India has witnessed a significant rise in the production of electricity from solar energy i.e., 50.10 billion units in 2019-20 from 1.65 billion units in 2012-13.
- **Wind:**
  - Coastal regions provide ample opportunities to harness wind energy. Due to the intervention of government as well as private players, wind power production capacity has increased from 10.9 GW in 2009 to 30.37 GW in 2020.
- **Bio-energy:**
  - The Government is promoting various schemes for biogas production, including the '**New National Biogas and Organic Manure Programme**' (NNBOMP) and '**Biogas Based Power Generation and Thermal Energy Application Programme**' (BPGTP).

- Apart from these, the Government has also proposed to set up 5,000 compressed biogas plants across India by 2023.
- **Hydro energy:**
  - It is economically exploitable and has a high potential for additional benefits such as irrigation, acting as a flood barrier and drought saviour, providing recreation and tourism-related activities. It has higher efficiency (over 90%) than other renewable sources.
- **Natural gas:**
  - A roadmap has been set for making India self-reliant in the energy sector which includes increasing usage of natural gas in the economy, setting up a network for supply of CNG and piped natural gas across the country, blending 20 per cent ethanol in petrol and electric mobility.
  - The Government has proposed to extract ethanol from sugarcane and other bio-elements in helping the production of cleaner energy.
- **National Hydrogen Mission**
  - It was announced in August 2021 to produce carbon-free fuels from renewable resources and to make India a global hub of production as well as export of green hydrogen.
  - The ultimate aim of this mission is to attain self-reliance in energy production and to achieve the set target by 2047 so as to celebrate the 100 years of independence.
  - The National Hydrogen Energy Mission will bring drastic changes in the energy sector and will contribute to a gas-based cleaner economy.


India **must exploit solar and wind energy**, and especially **green hydrogen** energy, in its electricity system to meet the ever-increasing energy demand. It will be possible primarily by **addressing the demand flexibility, plants flexibility, and storage & grid flexibility** along with the **market and regulatory support**.

The **new energy map of India** directly focuses on sustainable sources of energy in meeting the growing demand. It is expected that 25% of the world's energy needs will be met by India by 2050 and that will help India in becoming a 10 trillion-dollar addressable market.

The aspects like **investment, infrastructure development, private-public partnership, green financing, policy framework need to be strengthened** both at the national level and regional level to cater to inclusiveness in the development process.








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