# Green Energy in India

### Why in news?

India’s energy landscape needs to address the challenges posed by China’s dominance in green energy materials is essential.

### What is green energy?

- **About**- It is the energy that can be produced using a method, and from a source, that causes no harm to the natural environment.
- **Solar energy**- It is typically produced using photovoltaic cells, which capture sunlight and turn it into electricity.
- **Wind power-** The air flow on the earth's surface can be used to push turbines, with stronger winds producing more energy.
- **Hydropower**- It is generated by the Earth's water cycle, including evaporation, rainfall, tides and the force of water running through a dam.
- **Geothermal energy**- It uses thermal energy that has been stored just under the earth’s crust.
- **Biofuel**- They are liquid fuels produced from *renewable* biological sources, including plants and algae.
- **Bioenergy**- It is produced from organic material, known as biomass, which contains carbon absorbed by plants through photosynthesis.

### What are the steps taken by India to promote green energy?

- **National Green Hydrogen Mission**- It focuses on direct and indirect employment, import substitution, and R&D for higher efficiency in renewable energy technologies.
- **PM KUSUM scheme**-It is aimed at ensuring *energy security* for farmers in India, along with honouring India’s commitment to increase the share of installed capacity of electric power from non-fossil-fuel sources to 40% by 2030 as part of Intended Nationally Determined Contributions (INDCs).
- **Investment-** India allows up to 100% Foreign Direct Investment under the *automatic route* for renewable energy generation and distribution project.
- **Production Linked Incentive (PLI)** - Scheme for high efficiency solar aims to enhance India’s manufacturing capabilities and exports in the solar sector.
- **Green Energy Corridors-** It is established to create *intra-state transmission* system for renewable energy projects.
- **International Solar Alliance-** It is a joint effort by India and France to mobilize efforts against climate change through deployment of solar energy solutions with an aim of *One Sun, One World, One Grid*.
- **Green carbon credits-**It is proposed by India to create *carbon sinks* through people’s participation.

- **Pradhan Mantri Suryodaya Yojana-** It was launched in 2024 to equip ***1 crore*** poor to middle-class households with rooftop solar panels in a bit to provide electricity from solar energy.

## How can India ensure energy security?

- **Integrate hydrocarbon PSEs-** Hydrocarbon Public Sector Enterprises like ONGC and Indian Oil are venturing into renewable energy sectors, this would prevent redundancy, optimize resource utilization and streamline efforts
- **Secure critical minerals**- Heavy reliance on China for critical technologies poses threat to national security hence India should ensure a stable and secure supply of essential minerals.
- **Balance clean energy competitiveness-** While prioritizing national security is essential, India must also consider the competitiveness of clean energy vis-a-vis fossil fuels.
- **Competitiveness of clean energy-** India should enhance domestic manufacturing capabilities and reduce dependency on imports.
- **Extend PLI scheme-** The Production Linked Incentive scheme needs to be extended to cover more segments of the renewable energy sector.
- **Protect domestic industries-** Implement tariffs and anti-dumping duties to protect domestic industries from unfair competition.
- **Promote local manufacturers-** Encourage public-private partnerships to build a robust local manufacturing ecosystem.
- **Foster private investment**- Mobilize private capital for sustainable energy projects and increase government funding for flagship renewable energy projects demonstrate feasibility and profitability.
- **Balance green transition-** Green transition needs to be balanced with economic growth and stability to ensure a smooth and balanced transition without adversely impacting the economy.
- **Form Inter-Ministerial Task Force-** This should be formed to oversee the implementation of the energy strategy, ensuring coordinated efforts across various government departments and agencies.
- **Periodic review-** Establish periodic review processes involving stakeholders from industry, academia, and civil society to assess progress and make necessary adjustments.
- **Holisitic approach**- Engage the public and private sectors through awareness programs highlighting the benefits and opportunities of the green transition.

## References


1. Indian Express- India's green transition
2. PIB- PM Suryodaya Yojana



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