



Energy security

CURRENT AFFAIRS GS PAPER-II (Section-I)

Meaning

- ✎ The IEA defines energy security as the uninterrupted availability of energy sources at an affordable price. Energy security has many aspects: long-term energy security mainly deals with timely investments to supply energy in line with economic developments and environmental needs. On the other hand, short-term energy security focuses on the ability of the energy system to react promptly to sudden changes in the supply-demand balance.

Significance

- ✎ Energy security has been significant to the economic transformation, global prosperity and well-being of the human kind. Energy security will continue to be detrimental to the existing life and much more crucial to the developing countries than the developed world. The world's demand for energy grew by 95% in the last 40 years and the future demand, estimated to be more than 90%, to be because of huge growth in demand from India and China. These resources are finite, and the direct links between energy supply and economic growth have pushed the issue of energy security at the core of the policy debate with a considerable impact on the geopolitics.

Scenario in India:

- ✎ India, one of the fastest growing major economies, is also the fastest growing energy consumer in the world. And set to become the most populous nation, it is not well endowed with energy reserves. India has **mammoth task** of meeting its economic and social developmental goals, and lift its millions of people out of poverty. The demand for energy in the coming years will accelerate further as India embarks on manufacturing through Government's much vaulted 'Make



in India' programme, developmental projects and access to electricity to all. Consequently, energy security has emerged as **one of the salient policy issues** over the past decade and a half, and the successive Indian governments have emphasised on addressing the impending energy crisis challenges.

- ✎ India's more than **50%** of energy needs is derived from domestic stocks of coal, mainly for the electricity. Coal shall remain India's most important energy source and critical to its growth for the decades ahead. However, the percentage of coal in India's energy mix will decline in the future. India, with 17% of the world's population, has just 0.8% of the world's known oil and natural gas resources.
- ✎ Today, oil accounts for **36%** of the country's primary energy use. This figure is set to rise both in absolute and in percentage terms. India's domestic production is not sufficient to meet its demand. As a result, India already imports **80%** of its crude oil needs. Without new and substantial domestic discoveries, imports will continue to increase. By contrast, natural gas currently provides only 8% of India's primary energy supply, and most of that gas comes from domestic sources, onshore and offshore. But the position is likely to change drastically as India plans towards the world average for the use of natural gas.

Energy reforms taken:

✎ **Policy reforms:**

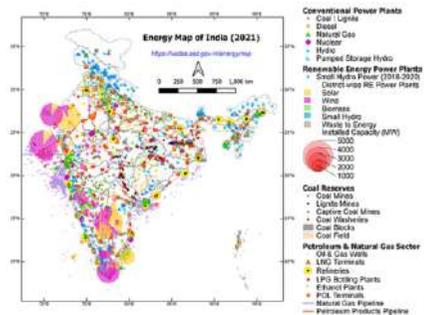
- ✓ **A High-Level Committee on Enhancement of Domestic Oil and Gas Exploration and Production**, finalised its recommendations. Based on the recommendations, the policy was approved by the Cabinet and notified. It is under implementation and we may expect results in the next 5–10 years.
- ✓ **Transition Towards Green Hydrogen Strategy:** The green hydrogen strategy document has undergone several rounds of consultations with different

stakeholders, who are encouraging many industries to consider opting green hydrogen. NITI Aayog is supporting the initiatives on the National Hydrogen Energy Mission for promoting green hydrogen.

- ✓ NITI Aayog collaborated with Indian Space Research Organisation (ISRO) to develop a comprehensive **Geospatial Energy Map of India**, which provides a holistic picture of India's energy sector. This includes the visualisation of spatial and non-spatial data on renewable and non-renewable power plants, oil and gas downstream sector, renewable energy potential, fossil fuel resources, and other energy assets.
- ✓ **The India energy security scenarios, 2047(IESS)** is an energy scenario building tool. It is to develop energy pathways leading up to the year 2047.

✎ **Schemes:**

- ✓ Commitment has been made to bring electricity to every household by 2022.
- ✓ Solar irrigation pump distribution has been done to make agriculture energy efficient.
- ✓ Pradhan Mantri Ujjawala Yojana has been launched at household level to distribute 50 million LPG connections to women of Below Poverty Line families.
- ✓ The National Mission for Enhanced Energy Efficiency (NMEEE) would conduct a thorough cost-benefit analysis of the available energy-efficient technologies and products across all sectors, especially agriculture, housing and transportation.
- ✓ The government is preparing to launch BS VI norms for the fuel transition of vehicles.





Technologies in energy sector:

- ✎ There is an enormous amount of innovation and investment in the energy sector. The areas attracting the most excitement involve cutting system costs, deepening understanding of combining energy sources, renewable energy's role in overall sustainability and, of course, hydrogen.
- ✓ **Internet of Energy** : Traditionally, electric power systems use a central architecture during construction that brings a new set of challenges to the industry. IoE addresses several of these challenges and offers greater efficiency and optimal design for building energy systems.
- ✓ **Blockchain**: Blockchain technology intends to unite all energy stakeholders under a single decentralized network. Electricity producers, distribution network operators, metering operators, providers of financial services, and traders potentially benefit from utilizing smart contracts.
- ✓ **Energy-as-a-Service (EaaS)** : EaaS allows for the transition from selling electricity to selling services such as consumption management, optimization of production, and tracking consumption. The presence of local energy sources and storage options accelerate energy efficiency across the grid while providing access to more people.
- ✓ **Quantum computing** in the energy sector focuses on developing new energy solutions, improving energy efficiency, and reducing the use of greenhouse gases. The scale and complexity of challenges facing the energy sector go beyond modern technology and are well suited for testing on quantum ones.

International cooperation:

- ✎ The **United States** and India have a long and successful strategic partnership in the energy sector. The energy



cooperation between the two countries, which is technical, economic, and bilateral, is strengthening year after year. It started in 2009 with Partnership to Advance Clean Energy (PACE). And even now the U.S.–India Energy Dialogue is convened annually. US–India Strategic Energy Partnership (SEP) and USAID India Energy Modelling Forum (IEMF) are recent initiatives.

- ✎ With **Russia**: recently, Indian Prime Minister in a virtual address at 6th Eastern Economic Forum (EEF) in Russia's Vladivostok said that “India-Russia energy partnership can help **bring stability to the global energy market.**” One of the examples of cooperation between the two countries in energy transformation is the joint venture between India's Reliance Industries Ltd. and Russia's Sibur, the country's largest petrochemicals producer. Russian companies have been involved in the construction of six nuclear reactors in the Kudankulam nuclear power project at Tamil Nadu.
- ✎ With **France**: In March 2021, the Union Cabinet of India approved a memorandum of understanding (MoU) on renewable energy cooperation between India and France. aims to improve technical cooperation between the two countries by collaborating on joint research working groups, working on pilot projects and facilitating capacity building programmes in the following key areas:
 - ✓ Solar
 - ✓ Wind energy
 - ✓ Hydrogen
 - ✓ Biomass
- ✎ Recently, The third **UK**-India Energy for Growth Dialogue concluded with Minister for Power and New and Renewable Energy and UK Business and Energy Secretary agreeing a new *joint programme on smart power and renewable energy*. The Smart Power, Renewable Energy and Storage programme will complement ongoing efforts to promote efficient power distribution, industrial energy efficiency,



electric vehicles, solar and offshore wind generation and energy storage.

- ✎ **Saudi** Centre for International Strategic Partnership (SCISP): Under the India–Saudi Arab strategic partnership, NITI Aayog has been engaged with SCISP to identify priority areas for strategic investment. Ministries and departments have identified priority areas for discussion.

Way forward

- ✎ Major transformations are underway in global energy sector, from growing electrification to the expansion of renewable energy, upheavals in oil production and globalization of natural gas markets. India needs to build its capacity in research and skills building to deal with these transformations in energy sector. India needs to ensure long term planning to ensure universal energy access and meeting its commitment under Paris Agreement to ensure sustainable and inclusive growth.

PERFECTION IAS

बुनियाद से सफलता तक

© 103, KUMAR TOWER, BORING RD, CROSSING, PATNA
Perfection IAS | Perfection IAS (Official) | www.perfectionias.com

9155090871 / 72 / 73