



Energy Security

 drishtias.com/printpdf/energy-security

Why in News

- India imports **80 percent of its oil needs** and is the **third largest oil consumer** in the entire world.
- India's energy consumption is expected to grow 4.5 percent every year for the next 25 years.
- Recently due to high International Crude Oil Prices, Current Account Deficit (CAD) inflated because of higher cost of oil import, raising concerns about long term economic stability in India, highlighting importance of energy security.
- On account of rising CAD, Indian Rupee touched its lowest.

Energy security

- It is defined as the **uninterrupted availability of energy sources** at an affordable price.
- **Long-term energy security** deals with timely investments to supply energy in line with economic developments and environmental needs.
- **Short-term energy security** focuses on the ability of the energy system to respond promptly to sudden changes in the supply-demand balance.

Significance of Energy security

- India aims to become leading global economic power which will fuel energy needs for providing infrastructure, provisioning of basic necessities, developing human skill, employment generation and manufacturing abilities.
- India's economic fortunes continue to be tied to the sharply fluctuating international price of oil.

Challenges for India's Energy Security

Policy Challenges:

- **Failure to attract international investment** in domestic hydrocarbon exploration e.g. NELP failed to attract interest of large international energy corporations.
- Major investments will have to be made to acquire hydrocarbon reserves abroad.
- **Coal mining** in India suffers from delays due to regulatory and environmental clearances.
- Indo-US nuclear helped fuel domestic power plants and give India access to critical technologies in strategic areas but deal did not lead to India setting up **foreign-built reactors**.

Accessibility Challenge:

- The household sector is one of the largest consumers of energy in India. It is responsible for about 45% of the total primary energy use. In rural areas, biomass accounts for 90% of total primary fuel consumption for cooking. This has serious health impacts on the rural people.
- Presently, 304 million Indians do not have access to electricity and around 500 million Indians are dependent on solid biomass for cooking.

Infrastructure and skill related challenges:

- **Lack of skilled manpower** and poorly developed infrastructure for developing conventional and unconventional energy.
- India **lacks transportation infrastructure** for making energy accessible e.g. pipelines can be a useful way to boost the total supply of gas in the country. Gas will play a major role in Indian energy mix because it can be used effectively in several demand sectors.

Economic challenges:

- Coal, oil and natural gas are the most important sources of primary energy in India. **Inadequate domestic supplies** of these hydrocarbons are forcing the country to increase its import bill.
- **Rising fuel subsidies**, rising CAD creates difficult conditions for economy.

External Challenges:

- India's fragile energy security is under severe pressure from its rising dependence on imported oil, regulatory uncertainty, international monopolies and opaque natural gas pricing policies
- India seeks to achieve its energy security through multiple partners e.g. Indo-USA nuclear deal, Oil import from Middle East etc. However, in recent times due to conflict among India's energy partners e.g. USA and Iran; India had to reduce oil import from Iran.
- In wake of its difficult geographic location in South-Asia, India faces strategic challenge to meet its energy needs.

- China's One Belt One Road initiative can give China definitive advantage if any conflict ensues between countries, by disturbing India's access to energy.
- Failure to get onboard all interested parties in IPI (Iran-Pakistan-India) gas pipeline and TAPI (Turkmenistan, Afghanistan, Pakistan and India) gas pipeline for assured supply of natural gas.

Measures to enhance energy security

Increasing accessibility to clean energy:

- India has already committed to bring **electricity to every household by 2022**. An even more ambitious goal would be to provide electricity to all households on 24x7 basis.
- To bring clean fuel in rural areas the **Pradhan Mantri Ujjawala Yojana**, should be complemented by: Setting up of biomass pelletising units; and distribution of 'efficient biomass chullahs'.
- On the agricultural front, **solar irrigation pump distribution** target must be stepped up and financed through credit support from NABARD and government subsidy.
- The **potential non-conventional energy sources** must be explored and researched to make them technologically economical and accessible, like geothermal energy, tidal energy etc.

Enhancing efficiency:

- The **National Mission for Enhanced Energy Efficiency (NMEEE)** should conduct a thorough cost-benefit analysis of the available energy-efficient technologies and products across all sectors, especially agriculture, housing and transportation.
- At the institutional level, the national and state designated agencies working in the area of energy efficiency should be strengthened.
- To enhance vehicle fuel efficiency gains, the auto fuel quality should be upgraded to **BS VI norms** for nation-wide launch in 2020.

Policy changes:

- Around three-quarters of our power comes from coal powered plants. It is important that India increases its domestic coal to reduce its dependence on imports. There is need to fast track the regulatory clearances, improve labour productivity, increase coal production and enhance efficiency of distribution.
- **Hydrocarbon Exploration and Licensing Policy (HELP)** intends to minimize government's discretion in decision making, reduce disputes, reduce administrative delays and introduce concept of revenue sharing, freedom of marketing to stimulate growth in the oil and gas sector in India.
- The **tax structure should be rationalized** in import and sale of energy on thermal value basis with a view to enhance the competitiveness of the economy.

- **The INDIA ENERGY SECURITY SCENARIOS, 2047(IESS)** has been developed as an energy scenario building tool. The guiding ambition of this is to develop energy pathways leading up to the year 2047, comprising of likely energy demand and supply scenarios.
 - **NITI Aayog** launched the India Energy Security Scenarios 2047 calculator (IESS 2047), as an **open source web based tool**.
 - The tool aims to **explore a range of potential future energy** scenarios for India, for diverse energy demand and supply sectors leading up to 2047.
 - It explores India's possible energy scenarios across energy supply sectors such as solar, wind, bio fuels, oil, gas, coal and nuclear and energy demand sectors such as transport, industry, agriculture, cooking and lighting appliances. The model allows users to interactively make energy choices, and explore a range of outcomes for the country-from carbon dioxide emissions and import dependence to land use.

Infrastructure:

- **Augment refining and distribution** of oil and gas. India should sustain its export capacity of refined products by setting up new refineries.
- At present, 31 companies are developing **City Gas Distribution (CGD)** networks in 21 states for transportation or distribution of natural gas to consumers in domestic, commercial or industrial and transport sectors through a network of pipelines.
- For the **hydro projects**, the government will need to make efforts to expedite progress on capacity under construction through satisfactory Rehabilitation & Resettlement implementation.
- India has also built its **strategic petroleum reserves** in order to meet any supply shocks due to any external exigencies like wars, natural disasters etc. Indian Strategic Petroleum Reserves Ltd, a special purpose vehicle under the Oil and Gas Ministry, has constructed three strategic petroleum reserves in huge underground rock caverns at **Visakhapatnam on the East Coast, and at Mangaluru and Padur on the West Coast**.
- These facilities, with total capacity of 5.33 million tonnes, can meet about 10 days of India's crude oil requirements. India now plans to build another 6.5 million tonnes of storage at **Padur and Chandikhol in Odisha** which will augment its supply to 22 days.

India's Energy diplomacy:

- India is setting up a web of energy relationships in the extended neighborhood covering Myanmar, Vietnam in the east, with Central Asian countries like Kazakhstan and Gulf countries in the west.
- Indo-US Nuclear deal opened new vistas for India in field of Nuclear energy facilitating cutting edge technology and nuclear fuel. India has started to engage with China, Kazakhstan and Australia for nuclear fuel.

- India's SCO membership could now play a bigger role in ensuring greater energy cooperation between energy producers and consumers by linking Central Asia and South Asia.

Promotion of Renewable Energy

- A renewable energy capacity of 100 GW should be achieved by 2019-20 so as to contribute to achievement of 175 GW target by 2022.
- **Solar Energy Corporation of India Limited (SECI)** should develop storage solutions within next three years to help bring down prices through demand aggregation of both household and grid scale batteries.
- A large programme should be launched to tap at least 50% of the bio-gas potential in the country by supporting technology and credit support through NABARD by 2020.

Conclusion

- 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.
- Challenges like carbon emissions, air pollution, and energy access outlines different possible future scenario for the energy security. The dynamic scenarios foreseen by INDIA ENERGY SECURITY SCENARIOS, 2047(IESS) should guide the policy makers 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.