

Introduction

- ❑ Energy is the power that comes from coal, electricity, gas, crude oil, etc. that are used for producing heat, driving machines, and other purposes. It is one of the basic infrastructures which helps in the overall development of the country's socio-economic conditions.
- ❑ Based on the long term availability, energy resources can be broadly classified into: Non-renewable energy and Renewable energy.
- ❑ Non-renewable energy resources are finite and do not get replenished after their consumption. For example, fossil fuels like coal, lignite, crude oil and natural gas, uranium, etc. On the other hand, Renewable Energy resources get renewed by nature again and again, and supply of renewable energy is not constrained by the consumption. For instance, solar, wind, biomass, tides and geothermal.
- ❑ However, energy demand in agriculture, industrial sector, and transport, commercial and household sectors has increased manifold, and has put enormous pressure on scarce resources which are used for generation of energy.
- ❑ The depleting scarce resources and our commitment to ensuring a pollution free environment also require us to ensure an optimum utilization of available energy resources. Thus, this will require us to go for a balanced mix of all the sources of energy and this must be done as per the socio-economic status of the country.
- ❑ Moreover, ensuring the efficiency in the use of energy and diversification of sources of energy can help ensure energy security of the nation.

Importance of Energy for India

- ❑ The Government of India has submitted socio-economic status of India, to the United Nations Framework Convention on Climate Change (UNFCCC)

in its Intended Nationally Determined Contribution (INDCs) which reflects the dire importance of energy for the development in the nation.

- ❑ The socio-economic status of India:
 - India accounts for 2.4% of the world's surface area, but supports around 17.5% of the world's population.
 - India houses the largest proportion of the global poor, around 30%.
 - Around 24% of the global population is without access to electricity (304 million).
 - About 30% of the global population relying on solid biomass for cooking in India.
 - 92 million people in India are still without access to safe drinking water.
- ❑ The average annual energy consumption in India during 2011 was only 0.6 tonnes of oil equivalent (toe) per capita as compared to a global average of 1.88 toe per capita.
- ❑ In addition to the above, no country in the world has been able to achieve a Human Development Index of 0.9 or more without an annual energy availability of at least 4 tonnes of oil equivalent (toe) per capita. According to Human Development Report 2018 of the United Nations Development Programme (UNDP), India's Human Development Index (HDI) is 0.640 and global rank is 130 among 189 countries.
- ❑ Besides, the pet projects of the Government of India like Make in India, Digital India, Startup India, Electricity for All, Housing, RURBAN Mission etc. depends on an uninterrupted supply of power.
- ❑ Also, realization of other national priorities like Bringing Green Revolution in Eastern India, Promoting Industrial Development in North Eastern India, Rapid Urbanization, etc. will require us to ensure affordable, efficient and uninterrupted supply of power. In fact, access to power not only ensures poverty alleviation but economic growth is also ensured.

Saubhagya Scheme

- ❑ The Pradhan Mantri Sahaj Bijli Har Ghar Yojana – ‘Saubhagya’ was launched by the government of India on 25th September 2017.
- ❑ Under Saubhagya free electricity connections to all households (both APL and poor families) in rural areas and poor families in urban areas will be provided. During the launch of the Scheme, there were around 4 crore un-electrified households in the country and as of now only around 18,000 houses are left to be electrified.

National LED Programme (DELDP, SLNP)

- ❑ National LED Programme aims for promoting the use of the efficient lighting technology at affordable rates, by replacing incandescent bulbs with LED bulbs.
- ❑ The Domestic Efficient Lighting Programme (DELDP) aiming to replace 77 crore incandescent bulbs with LED bulbs by providing LED bulbs to domestic consumers.
- ❑ The Street Lighting National Programme (SLNP) aimed to replace 3.5 crore conventional streetlights with smart and energy-efficient LED streetlights by March 2019.

Ujjawal DISCOM Assurance Yojana (UDAY)

- ❑ Power outages adversely affect national priorities like ‘Make in India’ and ‘Digital India’, Small and Medium Industries, Agricultural growth and other socio-economic progress in the country. Besides, default on bank loans by financially stressed distribution companies (DISCOMs) can not only hamper the development and growth, but also potentially impact adversely the banking sector.
- ❑ UDAY scheme for the financial turnaround of the power distribution companies has been formulated and launched by the Government of India, in consultation with the various stakeholders such as DISCOMs and state governments for financial and operational turnaround of DISCOMs and to ensure a permanent solution to the problem.
- ❑ The scheme envisages reducing the interest burden, the cost of power and AT&C losses. To achieve operational and financial turnaround DISCOMs and participating states have entered into a tripartite agreement with the Government of India. Also, best performing states is being incentivized for rational tariff revision.

National Smart Grid Mission

- ❑ A smart grid is an electrical grid, which can monitor power flows from the points of generation to the points of consumption, and control the flow of power or curtail the load to match generation on real-time basis. It is done using automation, communication and information technologies.
- ❑ Smart Grid helps in real time monitoring, automated outage management and faster restoration. This enables consumers to enjoy the improved reliability and better quality of power.
- ❑ Smart Grid can be used for Dynamic Pricing Mechanisms by sending pricing signals to consumers. This incentivizes to curtail their demand during different times of the day, enabling the optimal use of power and minimization of electricity bills.
- ❑ Technologies like in-house displays, programmable control thermostats, portals and energy information tools like mobile apps allow consumers to track and manage their energy usage and identify opportunities to reduce and conserve electricity.
- ❑ Smart Grid also facilitates the distributed generation, especially the rooftop solar power generation, by allowing movement and measurement of energy in both directions by using control system and net metering. This will help Prosumers (consumers who both produce and consume electricity), to safely connect to the grid.

Initiatives for Energy Efficiency

Bureau of Energy Efficiency (BEE)

- ❑ BEE was set up in 2002 as mandated in the Energy Conservation Act, 2001. Its function is to give policy directions and developing strategies to increase energy efficiency of the Indian Economy.
- ❑ BEE has launched following programmes to ensure Energy Efficiency in the country.

National Mission for Enhanced Energy Efficiency (NMEEE)

- ❑ NMEEE is a part of the National Action Plan on Climate Change (NAPCC). It aims to strengthen the market for energy efficiency by creating conducive regulatory and policy regime to promote energy efficiency.
- ❑ NMEEE has evolved four initiatives to enhance energy efficiency in energy intensive industries which are as follows: