INDIAN ECONOMIC GEOGRAPHY

~~Water Resources~~

~~Minerals~~

~~Conventional Energy Resources~~

Non-Conventional Energy Resources

Nuclear Energy

Locational Factors for Major Industries

Industrial Regions

Non-Conventional Energy Resources

INTRODUCTION

- With increasing demand for energy and with fast depleting conventional sources of energy such as coal, petroleum, natural gas, etc. the non-conventional sources of energy such as energy from sun, wind, biomass, tidal energy, geo-thermal energy and even energy from waste material are gaining importance.

INTRODUCTION

- This energy is abundant, renewable, pollution free and eco-friendly. Thus it is capable of solving the twin problems
    1. First, of energy supply in a decentralised manner and
    2. Secondly, helping in sustaining cleaner environment.
- It is the energy of the future. No wonder, non-conventional energy is fast catching the imagination of the people in India.

INTRODUCTION

- The renewable energy programme started with the establishment of the Department of Non-Conventional Energy Sources (DNES) in 1982.
- Indian Renewable Energy Development Agency (IREDA) was set up in 1987.
- It was later renamed as Ministry of New and Renewable Energy (MNRE) in 1992.

SOLAR ENERGY

INTRODUCTION

- Sun is the source of all energy on the earth. India, being a tropical country, is well endowed with plenty of solar energy. As our country is literally soaked in sunshine, exploitation of solar energy is an extremely important component of renewable energy.

INTRODUCTION

- Although solar energy can be gainfully used in any part of the country except some higher areas in the Himalayan ranges, the Thar Desert of Rajasthan holds great promise in this direction. Scientists are of the opinion that the vast expanse of the Thar Desert could well earn the distinction of being the biggest solar power house of the world. Parts of Kathiawar peninsula, Maharashtra, Karnataka, Andhra Pradesh, Telangana, Madhya Pradesh, West Bengal, Jharkhand, Bihar, Uttar Pradesh, Haryana and Punjab also hold great possibilities of harnessing solar energy.

INTRODUCTION

- Solar radiant energy can be used through thermal as well as photovoltaic routes. Both solar thermal and photovoltaic applications have large potential in the country.

SOLAR THERMAL ENERGY

- Soaked in abundant sunshine, India offers an excellent opportunity for converting solar energy to thermal energy. Several solar thermal technologies have been developed. These include solar water heaters, solar cookers, solar heaters, solar distillation systems, etc.

SOLAR THERMAL ENERGY

- Solar Water heating is one of the main technologies being promoted. Water heating technology for low temperature range is mainly based on flat plate collectors, which absorb solar radiation and raise the temperature of water upto 80°C.
- This hot water can be used for various applications in homes, hotels, hostels, restaurants and hospitals.
- With the increasing acceptability in the residential sector, solar water heaters can be set up in multi-storeyed residential flats for meeting the hot water requirement.

SOLAR THERMAL ENERGY

- Solar air heaters and dryers can conveniently be used both in industry and agriculture. Already a number of solar drying systems have been installed in the country and these are helping to save significant amounts of conventional fuels.
- Among the industries using these are tea, food processing, dal mills and spice manufacturers. Solar air heaters are also being used for space heating in the cold regions.
- Various types of collectors have been fabricated and are currently under use.

SOLAR THERMAL ENERGY

- Solar cooker is a simple device which cooks food with the help of solar energy and saves conventional fuels to a significant extent.

PHOTOVOLTAIC APPLICATIONS

- Solar Photovoltaic (SPV) technology enables direct conversion of sunlight into electricity without any moving parts and without causing pollution.
- Photovoltaic cells are made of silicon and other materials. When sunlight strikes the silicon atoms it causes electrons to eject. This principle is called as '**photoelectric effect**'.

PHOTOVOLTAIC APPLICATIONS

- A typical solar cell is a transparent wafer that contains a very thin semiconductor.
- Photovoltaic systems and power plants have emerged as viable power sources for applications such as lighting, water pumping and telecommunication and are being increasingly used for meeting the electrical energy needs in remote villages, hospitals, besides households in the hilly, forest, and desert areas as well in islands.

PHOTOVOLTAIC APPLICATIONS

- Efforts are being made to popularise the use of solar greenhouse for growing vegetables during off-season in cold and dry areas of Leh and Kargil. Solarised huts are being designed in cold areas of Jammu and Kashmir and Himachal Pradesh to keep the buildings warm.

JAWAHARLAL NEHRU NATIONAL SOLAR MISSION (NSM)

- The Jawaharlal Nehru National Solar Mission, also known as National Solar Mission, is one of the eight key National Mission's which comprise India's National Action Plan on Climate Change (NAPCC).
- NAPCC was launched on 30th June 2008 which identified development of solar energy technologies in the country as a National Mission.
- The mission was approved on January 11, 2010 by the government.

JAWAHARLAL NEHRU NATIONAL SOLAR MISSION (NSM)

- The Mission has set the ambitious target of deploying 20,000 MW of grid connected solar power by 2022, which was revised to 1,00,000 MW by 2022 during June 2015.
- MNRE has proposed to achieve it through 40,000 MW through Rooftop Solar Projects and 60,000 MW through Large and Medium Scale solar projects.

JAWAHARLAL NEHRU NATIONAL SOLAR MISSION (NSM)

Objectives of the program are:

1. To establish India as a global leader in solar energy, by creating the policy conditions for its diffusion across the country as quickly as possible.
2. To promote ecologically sustainable growth while addressing India's energy security challenges.

JAWAHARLAL NEHRU NATIONAL SOLAR MISSION (NSM)

- Long term goal: Global leader in solar energy; maximum in energy production.
- Immediate goal: Setting up an enabling environment for solar technology penetration in the country.
- Targets are set for three phases:
  - First phase 2010-13
  - Second phase 2013–17
  - Third Phase 2017–22

Ultra Mega Solar Power Plants

- Ultra Mega Solar Power Projects, also known as Ultra Mega Solar Parks, are a series of solar power projects planned by the Ministry of New and Renewable Energy of the Union Government of India. Each power project has a minimum capacity of 500 MW.
- In December 2014, the Government of India introduced a scheme to establish at least 25 solar parks and Ultra Mega Solar Power Projects, adding over 20 GW of installed solar power capacity.

Ultra Mega Solar Power Plants

- The Central Government provides financial support for the construction of these solar projects.
- In February 2017, the Union Cabinet increased the total number of planned solar parks to 50 with a total capacity of 40 GW. By April 2017, 34 solar parks were under construction across 21 states.