

## **EE3014-POWER ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS**

### **UNIT I- INTRODUCTION**

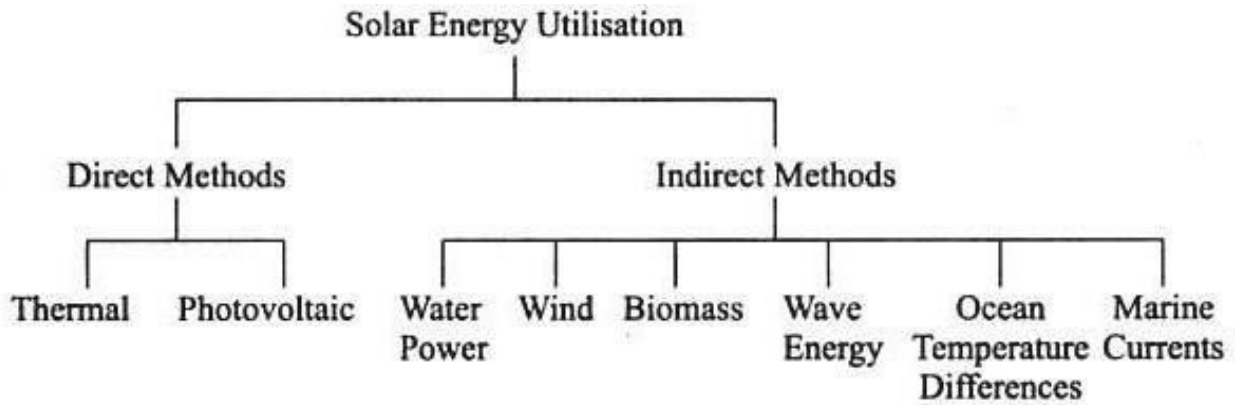
#### **1.1 CLASSIFICATION OF ENERGY SOURCES**

##### **NON-CONVENTIONAL SOURCES/ RENEWABLE ENERGY SOURCES**

A plenty of energy is needed to sustain industrial growth and agricultural production. The existing sources of energy such as coal, oil, uranium etc. may not be adequate to meet the ever increasing energy demands. These conventional sources of energy are also depleting and may be exhausted at the end of the century or beginning of the next century. Consequently sincere and untiring efforts shall have to be made by the scientists and engineers in exploring the possibilities of harnessing energy from several non- conventional energy sources.

The various non-conventional energy sources are as follows:

1. Solar energy
2. Wind energy from biomass and biogas
3. Ocean thermal energy conversion
4. Tidal energy
5. Geothermal energy
6. Hydrogen energy
7. Fuel cells
8. Magneto-hydro-dynamic generator
9. Thermionic converter
10. Thermo-electric power.



## IMPORTANCE OF NON-CONVENTIONAL ENERGY SOURCES

### MAN AND ENERGY:

- ENERGY is the ability to do work.
- ENERGY is the primary and most universal measure of all kind of work by human-beings and nature.
- Energy: It is the capability to produce motion, force, work, change in shape, change inform etc.

Energy exists in several forms such as:

- Chemical energy
- Nuclear energy
- Mechanical energy
- Electrical energy
- Internal energy
- Bio-energy in vegetables and animal bodies
- Thermal energy etc.

## ADVANTAGES OF CONVECTIONAL/NON RENEWABLE ENERGY SOURCES

- Man has needed and used energy at an increasing rate for his sustenance and well- being ever since he came on the earth a few million years ago.
- Primitive man required energy primarily in the form of food.

He derived this by eating plants or animals which he hunted. Subsequently he discovered fire and his energy needs increased as he started to make use of wood and other biomass to supply the energy needs for cooking as well as for keeping himself warm.

- With the passage of time man started to cultivate land for agriculture. He added a new dimension to the use of energy by domesticating and training animals to work for him. With further demand for energy, man began to harness the wind for sailing ships and for driving windmills, and the force of falling water to turn waterwheels.
- Till this time, it would not be wrong to say that the sun was supplying all the energy needs of man either directly or indirectly and that man was using only renewable sources of energy. Advantages of convectional/non renewable energy sources
- The advantage of non-renewable energy is it's easy and cheap to use.
- There is no better way to store transfer and use energy than gasoline for powering motor vehicles.
- It's quick to pump fossil fuel into a car. It's stable in the tank and a gas tank hold quite a bit, and a gasoline powered car is cheap to manufacture.
- Coal is a ready-made fuel. It is relatively cheap to mine and to convert into energy. Coal supplies will last longer than oil or gas Oil is a ready-made fuel. Relatively cheap to mine and to convert into energy. It is a relatively cheap form of energy.
- Natural Gas is a ready-made fuel. It's as lightly cleaner fuel than coal or oil, emitting less carbon dioxide.
- Nuclear has a small amount of radioactive material produces a lot of energy. And raw material are relatively

cheap and can last quite a longtime. It doesn't give off atmospheric pollutants.

## **DISADVANTAGES OF CONVECTIONAL/NON RENEWABLE ENERGY SOURCES**

- They leave behind harmful by-products upon combustion, thereby causing a lot of
- Pollution; mining of such fuels leads to irreversible damage to the adjoining environment.
  - Fossil fuels pollute the environment. They will eventually run out. Prices for fossil fuels are rising, especially if the real cost of their carbon is included. Burning fossil fuels produces carbon dioxide, a major cause of global warming.