

CHE 110: Environmental Studies

Unit - 1

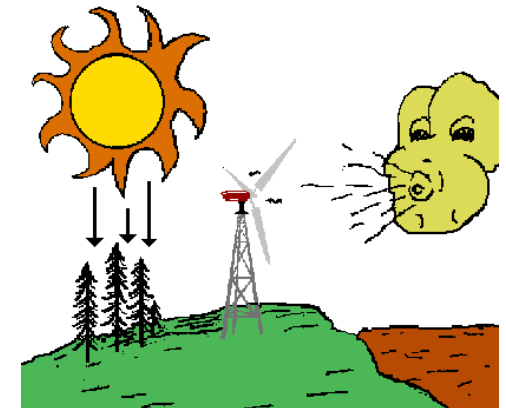
INTRODUCTION TO ENVIRONMENTAL STUDIES

Unit: 1_Lecture: 6_CHE110_VK



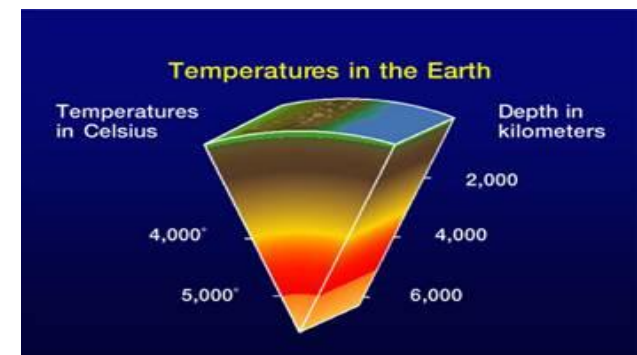
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- ❑ All living creatures on the earth, either it is a plant, an animal or a microbe need energy to perform their vital functions.
- ❑ The earth is a vast storehouse of energy.
- ❑ The fossil fuels beneath its surface, the wind and water on its surface, the plants growing on it, the sunlight falling upon it, these are all sources of energy.
- 90% of the energy used today is in the form of fossil fuels.
- Forms of energy OTHER than fossil fuels are termed “alternative” energy sources.
- Alternative energy sources can be divided into two main categories.



Renewable Sources of Energy

- Solar Energy
- Wind Energy
- (India's potential approx
- 20,000 MW)
- Tidal Energy
- Geothermal Energy
- Biomass Based Energy (Natural
- vegetation,
- animal waste)

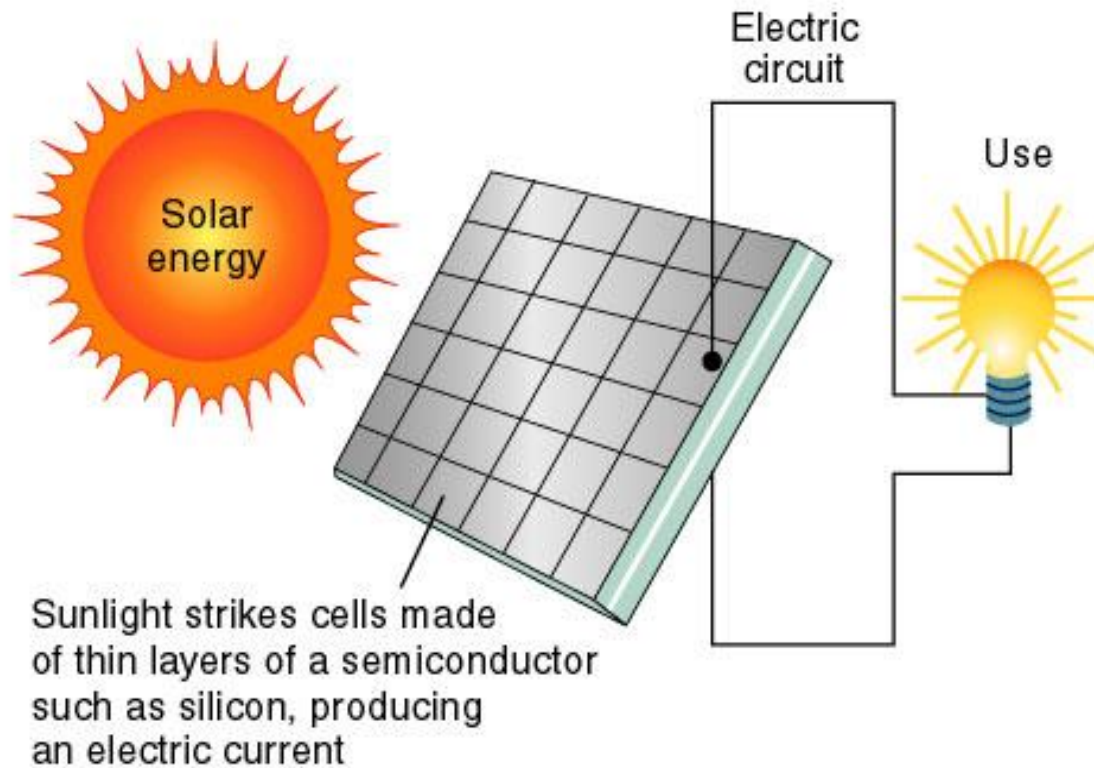


Non-Renewable Sources of Energy

- Coal
- Natural gas and oil
- Nuclear energy (Controversial Because they use radioactive Substance but it does not emit any Green house gas or toxic gases.



Electricity is created directly from special solar panels.



- Energy from **organic matter**
- Probably the first source of energy for man, this energy is **renewable and abundant**.
- Already in use in many places, such as sugar plantations and saw mills.
- Also includes the burning of urban waste, in “trash to steam” plants.

Renewable Energy Source

<http://study.com/academy/lesson/what-is-a-renewable-energy-source-definition-example-quiz.html>

Non renewable energy sources

<http://study.com/academy/lesson/renewable-non-renewable-resources-definition-differences.html>

Use of alternate energy sources

<http://video.nationalgeographic.com/video/alternative-energy?source=relatedvideo>

Case studies: indias-rising-energy-needs

<https://www.youtube.com/watch?v=xP0MuoYnMl0>

Case Studies in Municipal Energy Conservation

<https://www.youtube.com/watch?v=Da6DhVAeN9sJK>

<https://www.youtube.com/watch?v=auBFn-u9b6A>

Energy recovery.

<http://www.energyrecovery.com/resource/2204/>

<https://www.youtube.com/watch?v=CEm6Dn47Z9c>

<https://www.youtube.com/watch?v=aPiT1AL4yZQ>

- ✓ Alternative sources provide a ray of hope.
- ✓ High installation costs and require maintenance.
- ✓ Short in availability of material which may be used in designing and manufacturing, like as supply of silicon is short which is essential for photovoltaic cell.
- ✓ Lack of human capital , affect the whole energy industry worldwide.
- ✓ Still, the benefits are driving governments, businesses and individuals allover the world to adopt this technology.

- The concept is to get energy by burning the waste
- By this principle the main benefits what we can get –
 1. Longer availability of crude oil.
 2. Reduction of waste volume by upto 90%.
 3. Reduced number of coal fired power plants.
 4. Slow climate change.
- Waste to energy plants (which is much advanced today) extract energy from trash
- This plant reduces the emission of green house gases
- Disadvantages-
 1. Proper care must be taken on choosing the trash which is to be burn.
 2. Indiscriminate burning may promote air pollution and may release toxic gases.
 3. Combustion of heavy metals are very harmful.

Urban Problems Related to Energy

The energy requirement in urban areas is many times greater than that in rural areas because of the following reasons:

- Activities that require large amounts of energy (industries, institutions, transportation, etc.) are concentrated in urban areas.
- Urban people have a higher standard of living compared to rural people and hence demand more energy for comfortable living.



❖ Use of alternative source of energy

- ❖ 15 European union nations including Spain and Germany have committed that by 2020, they will generate 20% of the energy using alternative energy resources.
- ❖ Alternative energy resources not only save the non renewable energy resources from being used up but also it's a green and clean technology.
- ❖ India has also taken several initiatives to promote the non renewable energy resources. Currently India is in 4th position in the world in generating wind energy.
- ❖ With the increasing price of petroleum, alternative energy resources are not optional but mandatory.
- ❖ India plans to manufacture biodiesel from vegetable oil.
- ❖ The cost of setting up a biomass plant is same as that of coal based power plant.