

ENERGY CONSERVATION, RENEWABLE ENERGY

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Introduction

Can you imagine life without lights, fans, cars, computers and television, or of fetching water from the well or river? This is what life would have been like had man not discovered the uses of energy.

We use energy to do work. Energy is the capacity to do work. Whether we do physical work, mental work or mechanical work, energy is always in use. Every change involves energy. Energy is all around us. Our energy comes from the food we eat. Food, therefore must have energy. Energy is not matter. No one has ever seen or tasted or smelled energy. But this doesn't mean that energy doesn't exist. A body possessing energy is capable of doing work.



APPLICATIONS OF ENERGY



- Energy lights our cities, powers our vehicles, and runs machinery in factories.
- It warms and cools our homes, cooks our food, plays music and gives us pictures on television.
- In other words, Energy is the capacity of matter to perform work as the result of its motion or its position in relation to forces acting on it.
- Energy can neither be created nor destroyed.



classification of energy

Non renewable sources of energy

- Sources which have accumulated in nature over a very long time and cannot be replaced very quickly.
- The non renewable sources of energy include coal, petroleum and natural gas.
- They are also called convectional sources of energy.
- Since it takes millions of years for these resources to develop inside the earth, they are getting exhausted fast.
- If we continue using the fossil fuels at the present rate, we will exhaust them within 50-100 years.

The need for us to develop better and safe sources of energy is perhaps the greatest now.



Renewable Sources of Energy

- Sources of energy which can be used again again and are not exhaustible.
- The examples are sun, water, wind and biomass.
- Such sources of energy are freely available and are free of cost.
- They don't pollute the environment.
- We should prefer the renewable sources of energy because:
 - They are available in plenty.
 - They are available free of cost.
 - They don't pollute air
 - They are not exhaustible.
- Means and ways to harness the renewable sources of energy more efficiently have to be developed.



Different types of renewable resources

Hydro energy

Solar energy

Tidal energy

Bio energy

Geothermal energy

Wind energy

Nuclear energy



Hydro Energy



- Water power, or hydropower, furnishes about 7% of the world's commercial energy out of which 4% is used in the US
- Where water flows from a high place to a lower one, the energy of the falling water can be captured and used to produce other forms of energy.
- Most water power is used to generate electric power.
- Water power supplies energy without pollution and without using up the water in the process.
- But costly dams and other structures are required to harness water power.

solar energy

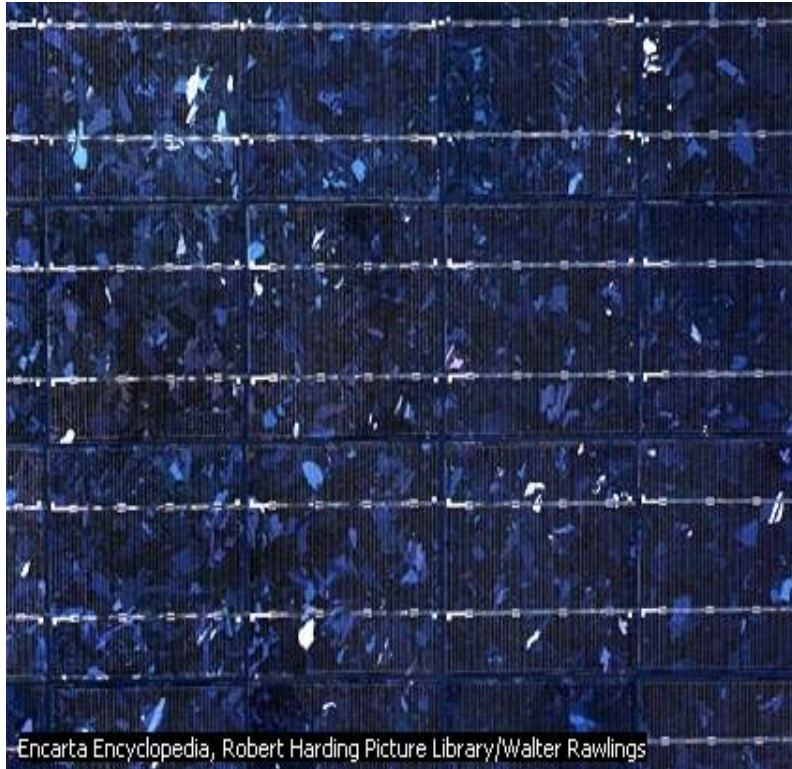


- Solar energy is used throughout the world to perform various small jobs.
- People capture this type of energy with various devices that change the sun's energy into heat or electrical energy.
- Flat-plate collectors convert solar energy into heat energy to heat water and the air inside the buildings.
- Solar cells, also called photovoltaic cells, convert solar energy into electrical energy.
- Solar power can provide a clean and almost unlimited source of energy. but it is thinly distributed over a wide area and must be collected and concentrated to produce energy.

In addition, darkness and bad weather interrupt the supply of sunlight.



Photovoltaic cells

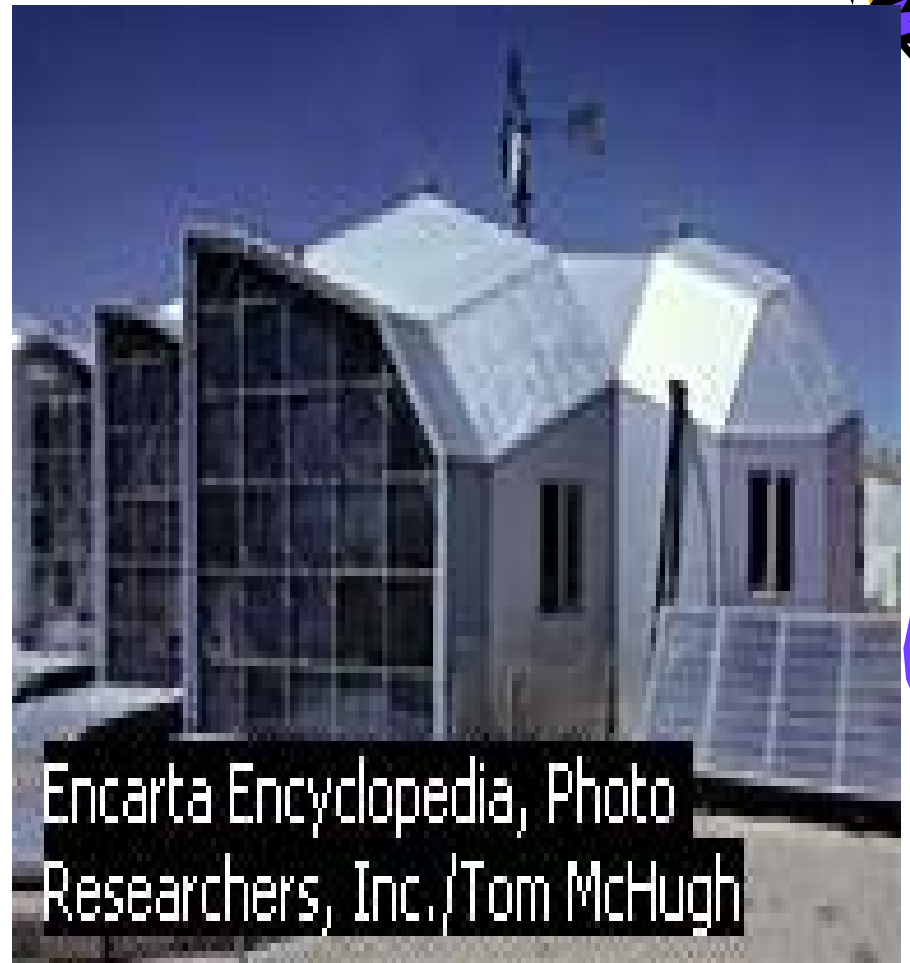


- In a photovoltaic cell, light excites electrons to move from one layer to another through semi-conductive silicon materials. This produces an electric current.



Solar Home

- In this solar home in Corrales, New Mexico, a flat plate solar collector (lower right) provides energy to heat water pumped by the windmill. The water is stored in large drums on the side of the home.



TIDAL ENERGY

Tidal energy comes from the energy of water as it flows from high tide to low tide.

This energy can be captured by closing a bay with a dam. As the tide rises, the bay fills with water. At high tide, the dam is closed to hold the water in the bay. At low tide, the stored water is released through a turbine to generate electric power.

The chief disadvantage of tidal power plants is that they can produce energy only during falling tides.

Also, the plants can be built in few places.

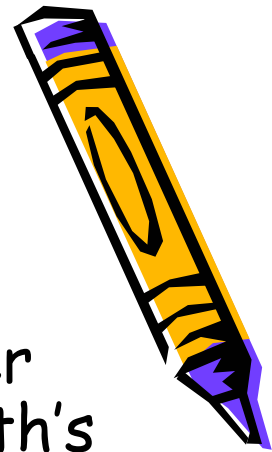
Bio Energy



- Biomass is a renewable energy resource derived from the carbonaceous waste of various human and natural activities
- It is derived from numerous sources, including the by-products from the timber industry, agricultural crops, raw materials from the forest, major parts of household waste and wood.
- Biomass does not add carbon dioxide to the atmosphere as it absorbs the same amount of carbon in growing as it releases when consumed as a fuel.
- It's advantage is that it can be used to generate electricity with the same equipment or power plants that are now burning fossil fuels.



Geothermal Energy

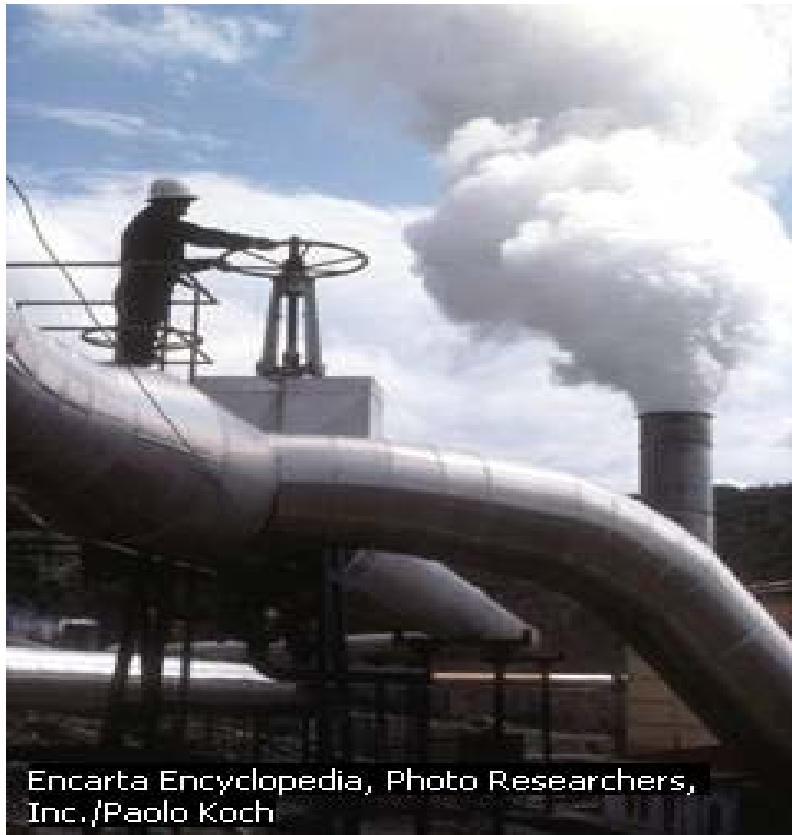


- Geothermal power is generated wherever water comes in contact with hot rocks below the earth's surface.
- The rocks give off heat that makes the water hot enough to turn in to steam.
- Power companies can drill wells and pump the hot water or steam to the surface, where it can be used to generate energy.
- In areas where no underground water or steam exists naturally, engineers can pump water into the ground to be heated by hot rocks.

Bolivia, Iceland, New Zealand, and the united states have developed geothermal power plants.



Geothermal energy plant



Encarta Encyclopedia, Photo Researchers, Inc./Paolo Koch

- Geothermal energy plants generate electricity and heat by harnessing the heat energy contained within the earth. The earth transfers its energy to deep-lying circulating water, which the plants access with wells and pumps. Geothermal energy is attractive because it creates almost no environmental pollution. However, the number of sites where geothermal energy can be economically extracted is limited.



Wind Energy



- **Wind power** is the conversion of wind energy into more useful forms, usually electricity using wind turbines.
- Most modern wind power is generated in the form of electricity by converting the rotation of turbine blades into electrical current by means of an electrical generator.
- Wind power is used in large scale wind farms for national electrical grids as well as in small individual turbines for providing electricity to rural residences or grid-isolated locations.
- Wind energy is ample, renewable, widely distributed, clean, and mitigates the greenhouse effect if used to replace fossil-fuel-derived electricity.





Photo Researchers, Inc.

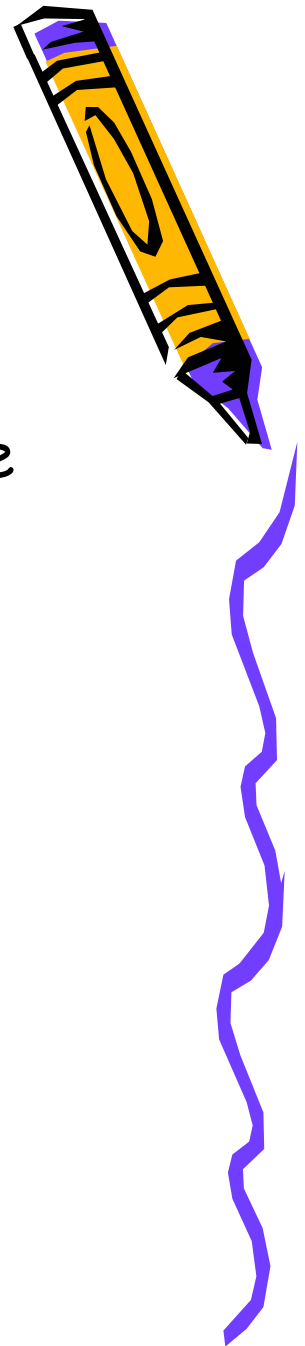
Wind Farm



- These turbines are part of a wind farm located near Lake Benton, Minnesota. This region is one of the most productive wind energy sites in the Midwestern United States.



Nuclear energy



- Nuclear energy provides about 6% of the commercial energy used in the world.
- Today, energy comes from fission- that is, the splitting of atomic nuclei of certain elements, especially uranium.
- But scientists hope eventually to produce nuclear energy from fusion, the combining of atomic nuclei.
- Nuclear fusion produces the heat and light of the sun and other stars, and the explosive force of the hydrogen bomb.

However, fusion devices have yet to produce usable amounts of energy.



Energy conservation

conclusion
conclusion



- Since energy resources are limited, we must use the available energy with utmost care and not waste it.
- Judicious and economical use can help in overcoming the energy crisis.
- The wise and economic use of energy resources is called conservation of energy.
- We should use more of renewable sources of energy as they are available in plenty and they don't pollute the environment.



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Thank U

