



# Biotechnology and Energy Conservation

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## 9<sup>th</sup> Lecture

### Introduction to Biotechnology and Energy Conservation

The Aim:

- Students can explain and give example about biotechnology (regarding with energy) and energy conservation
- Students can explain about the types, sources, uses, risks, and sustainability of energy

## Introduction to Biotechnology and Energy Conservation

- ▶ **Introduction to Energy Conservation**
  - ▶ Definition and example of energy conservation
  - ▶ Why energy conservation is important?
  - ▶ Types of energy
  - ▶ What is bioenergy?
  - ▶ How to have a renewable energy?
- ▶ **Introduction to Biotechnology**
  - ▶ Definition and example of biotechnology
  - ▶ What is the requirements for biotechnology activity

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## Type, source, and uses of energy

### Type and source of energy

1. Chemical energy
  - 1) Oil
  - 2) Coal
  - 3) Natural gas
  - 4) Hydrogen gas
  - 5) Alcohol
  - 6) Bioethanol
  - 7) Biodiesel
  - 8) Biogas
  - 9) Biomass
2. Solar energy
3. Geothermal
4. Wind energy
5. Hydro energy
6. Wave energy
7. Nuclear energy

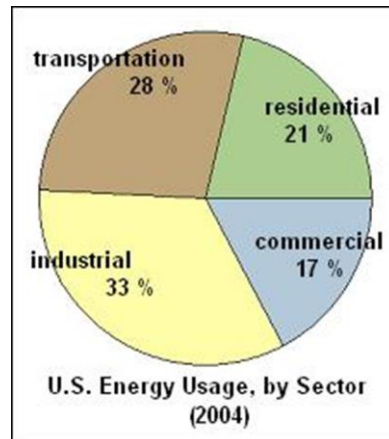
### Uses of energy

Energy source	Uses
Fuel oil	Electricity, transportation, heating
Coal	Electricity, (transportation), heating
Natural gas	Electricity, transportation, heating
Nuclear	Electricity, "transportation"
Solar energy	Electricity, transportation, heating
Geothermal	Electricity
Wind	Electricity
Hydro	Electricity
Wave	Electricity
Alcohol	Transportation
Biomass	Heating
Biogas	Transportation, electricity, heating
Bioethanol	Transportation
Biodiesel	Electricity, transportation
Hydrogen gas	Transportation

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## Segment of energy uses in US



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## Source of energy, risk, and sustainability

1. Oil fuel → **emission gas; unrenewable**
2. Coal → **emission gas; unrenewable**
3. Natiral gas; **unrenewable**
4. Nuclear → **radio active waste; unrenewable**
5. Geothermal; **renewable**
6. Alcohol; **unrenewable**
7. Wind; **renewable**
8. Hydro; **renewable**
9. Wave; **renewable**
10. Biomass → **emission gas; renewable**
11. Biogas; **renewable**
12. Bioethanol; **renewable**
13. Biodiesel; **renewable**

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