

## Outline

- I. Compare alternative energies such as solar, biomass, and wind energy to fossil fuels and nuclear energy.
- II. Situation and problems
  - A.) Fossil fuels are the most popular type of energy currently being produced. There are many dangers to the environment causing many problems the world has today. These power plants are fueled by coal, gas or oil.
  - B.) Nuclear energy is a nonrenewable source that causes a harmful waste and has a very high initial cost all for the sake of energy production.
- III. Original design
  - A.) Currently fossil fuels are the most widely used for energy.
  - B.) Nuclear energy is also being used.
- IV. Alternatives
  - A.) Solar energy
  - B.) Biomass energy
  - C.) Wind energy.
- V. Cost of alternatives
  - A.)Solar-
  - B.)Biomass
    - a.) In the different forms, the initial cost of biomass is different about \$200-\$100,000(Just for the machine or raw materials)
    - b.) Initial cost
    - c.) Operating cost
    - d.) Maintenance cost
  - C.)Wind
    - a.) Initial cost of windmill \$45000-\$50,000
    - b.) Minimal operating cost
- VI. Technical Data
  - A.) Fossil Fuels
    - a.) Plants cost in the hundreds of millions of dollars.
    - b.) For a coal power plant, around 820,000 tons of coal is needed to fuel the plant.
    - c.) 30% of energy is coal energy (most plentiful), 20% is gas, and 40% is from oil
  - B.) Nuclear Energy
    - a.) It can cost upwards of 4.2 billion dollars to build a plant
    - b.) On average it takes 440,000 tons of rock to fuel a plant for one year, thus producing 33 tons of Uranium with the rest of the tonnage is radioactive waste.
    - c.) Its by-products can be used in weapons of mass destruction thus causing alarm to who has this material.
  - C.)Solar
  - D.)Biomass
    - a.) A 10 cubic meters of biogas digester can make the annual festival two tons of diesel
    - b.) China's development of biomass resources total about 700 million tons of standard coal

c.) Now there are more than 140 ~180 billion tons of plants growing every year. If we change them into fuels, they are almost 10 times more than our fuels we are using now every year.

d.) Biomass fuels takes up 15% of the current fuels that we are using now.

E.) Wind

a.) One windmill can produce 1.5-4 million kilowatt-hours per year, enough to power 150-400 homes.

b.) Currently wind energy is used in several states.

VII. Non-technical data

A.) Fossil Fuels.

a.) Plants burn their specific fuel to create steam which turns and charges turbines.

B.) Solar

C.) Biomass

a.) British waste as raw materials to achieve 18MW gas to generate electricity

b.) Hasikeer Industrial Corporation in the United States established a demonstration project: 1MW power generation by rice husk handled husks 12 tons, with an annual generating capacity of eight million, with an annual output of 2,500 tons of alcohol

c.) In Germany, biomass energy production in 2005 accounted for the eventual creation of renewable energy by 68%. In the heating, biomass energy creates 94% of the total renewable energy heating.

D.) Wind

a.) Becoming more common

b.) Research on the storage of the energy created is being conducted.

VIII. Advantages and Disadvantages of the alternatives

A.) Fossil Fuels

a.) Advantages

- 1.) Large amounts of energy produced
- 2.) Transportation of materials is easy
- 3.) Gas fired power stations are efficient
- 4.) Can be built anywhere fuel can be transported to.

b.) Disadvantages

1.) Pollution

- A.) Greenhouse gases
- B.) Global warming
- C.) Water and Land pollution
- D.) Thermal pollution

- 2.) Mining coal is difficult and dangerous. At times destroying landscape
- 3.) Coal power stations need large quantities of coal, covering countryside with coal supplies

B.) Nuclear Energy

a.) Advantages

- 1.) No greenhouse emissions
- 2.) Large fuel reserve
- 3.) Does not pollute air

b.) Disadvantages

- 1.) Risk of accident

- 2.) Nuclear waste
- 3.) Thermal pollution

C.) Solar

D.) Biomass

a.) Advantages

- 1.) Energy efficient
- 2.) Does not pollute environment
- 3.) Safety and can transport into different forms for need
- 4.) Large fuel reserve
- 5.) Extensive source (more than 250,000 organisms on the earth that we have known can be used to make biomass fuels)
- 6.) Have a great foreground

b.) Disadvantages

- 1.) Small-scale use
- 2.) Plant only can store a very small amount of solar energy into organic matter
- 3.) Organic low energy per unit of land surface
- 4.) Abundant moisture organic (50% ~ 95%).

E.) Wind

a.) Advantages

- 1.) Renewable
- 2.) Energy efficient
- 3.) Tax incentive
- 4.) Environmentally friendly

b.) Disadvantages

- 1.) Size
- 2.) Noise
- 3.) Slight decline in bird population
- 4.) Zoning laws
- 5.) Large installation cost
- 6.) At the moment not a good way to store the energy produced.

IX. Graphic illustrations of the designs

A.) Fossil Fuels

a.) Pictures

B.) Nuclear Energy

a.) Insert picture of process

C.) Solar

D.) Biomass

- a.) Show the picture organisms' metabolism (not only the organisms but also the organisms' excretion and other deriving things from them can be used)
- b.) Show the garbage we made in our daily life and the offal some companies made can also be used.

E.) Wind

- a.) Picture of how the windmill converts the movement into energy.

X. Problems and Cost with implementing

A.) Nuclear Energy

- a.) Problems
  - 1.) Finding an area to build one
  - 2.) Ensuring security of byproducts
  - 3.) Energy needed during construction
- b.) Cost
  - 1.) High initial cost, up to 6 billion dollars
  - 2.) Cost of moving, storing waste
  - 3.) High Maintenance cost

B.) Fossil Fuels

- a.) Problems
  - 1.) Coal mining is dangerous
  - 2.) Oil reserves declining rapidly
  - 3.) Harmful to environment
- b.) Cost
  - 1.) Hundreds of million for initial cost
  - 2.) Cost of mining oil or coal

B.) Solar

C.) Biomass

- a.) Problems
  - 1.) The lack of land suitable for planting
  - 2.) Low calorific value
  - 3.) Bulky and difficult to transport
  - 4.) Currently, it is hard to plough into operation
  - 5.) Need tremendous funds to study
- b.) Cost
  - 1.) Low initial cost but need a lot of raw materials
  - 2.) Low operating and maintenance cost

D.) Wind

- a.) Problems
  - 1.) Location
  - 2.) Zoning issues
- b.) Cost:
  - 1.) Very high installation cost
  - 2.) Minimal operating and maintenance cost

XI. Estimated net savings

A.) Solar

B.) Biomass

- a.) The energy stored in biomass is equivalent to 10 times the world's annual energy consumption

C.) Wind

- a.) May save up to 30% on electric bills

XII. Other Items of interest

XIII. Summary