

Chemistry 500: Chemistry in Modern Living

Topic 6: New Energy Sources for the New Century

Alternative "Green" Energy Sources

Chemistry in Context, 2nd Edition: Chapter 9, Pages 281-318

Chemistry in Context, 3rd Edition: Chapter 8, Pages 305-336

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Outline

6A	WHY NOT STICK WITH THE ENERGY WE ARE USING NOW?	3
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6C	WIND POWER.....	6
6D	THE HYDROGEN ECONOMY.....	7
6E	BIOMASS AND GARBAGE.....	8

6B Solar Energy

- Photovoltaics (Solar Cells)
 - Graphics from Text: Figure 9.11 in 2nd Edition and 8.14 in 3rd Edition, Photovoltaic Cell
 - Graphics from Text: Figures 8.16 and 8.17 in 3rd Edition, Photovoltaic arrays
 - Ask Students: Develop a list of current uses of Photovoltaic technology
 - Group Activity

- Ask Students: Develop a list of future uses of Photovoltaic technology
 - Group Activity

- **Photothermal Energy**

- **Passive heating**

- **Graphics from Text: Figure 9.1 in 2nd Edition, Passive**

- Solar Heating**

- **Solar thermal on land**

- **Solar thermal from oceans**

- **Costs**

- **R&D**

- **Capital**

- **Operating**

- **Land Area**

- **Benefits**

6C Wind Power

➤ Wind farms

➤ Graphics from Text: Figure 9.2 in 2nd Edition: Wind Farm

➤ Ask Students: What are some of the advantages and disadvantages of Wind Energy

➤ Group Activity

6D The Hydrogen Economy

- Hydrogen production
 - Current industrial route
 - Made from hydrocarbon fuels
 - Electrolysis
 - Graphics from Text: Figure 9.6 in 2nd Edition and 8.2 in 3rd Edition, Electrolytic cell
 - Photolytic Hydrogen Generation

- Hydrogen storage: energy density

6E Biomass and Garbage

- Everything old is new again

- Thermal generation of electricity
 - Industrial Waste

 - Household Waste

 - Agricultural Waste

- Ask Students: What are the strengths and weakness of this sort of alternative energy

- Group Activity

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