



# Watts On Your Mind?

Solar energy educational activities for schools

## Activity Overview

Grade Level: 9-12

Activity: HS-4

## Description

Students will get an overview of renewable energy by reading the supplemental information provided “Facts About Renewable Energy”, answering questions relating to the information and graphing data provided in the activity.

## Learning Outcome

Students will learn the basic facts about various renewable energy sources and identify the advances and disadvantages of each source.

## Subjects

Science, math, government, economics

## Process Skills Used

Discussion, research, presentation,

## Duration

1 class period

## Key Vocabulary

(Refer to supplemental vocabulary page)

## Curriculum Standards

Texas (TEKS): 112.42.c.6, 112.44.c.5

Louisiana (LSCS):

SE-H-B1, SE-M-A6

Arkansas (ASCF) 4.1.28:

National (AAAS Project 2061):

The Designed World – 12<sup>th</sup>

## Introduction to Renewable Energy

### Materials

1. “Facts About Renewable Energy” summary and “Renewable Energy Vocabulary” by the Alliance to Save Energy
2. Worksheet A – Renewable Energy Basics
3. Worksheet B – Graphing Energy Facts

### Method

1. Read “Facts About Renewable Energy” referring to the vocabulary pages when necessary.
2. Complete Worksheets A and B



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## Worksheet A – Renewable Energy Basics

Complete the chart below about the basic types of renewable energy resources.

Type	Definition	Examples	Advantages	Disadvantages
Solar				
Hydropower				
Wind Energy				
Geothermal				
Biomass				

1. List those energy sources that are fossil fuels.

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2. What main *advantage* do fossil fuels have over the renewable energy resources?

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3. What are two main *disadvantages* of fossil fuels compared to renewable energy?

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## Worksheet B – Graphing Energy Facts

Part I: The table below lists United States primary energy consumption by source in 1973 and 1991.

### Primary Energy Consumption (percent)

	1973	1991
Petroleum	46.9	40.4
Nuclear Power	1.2	8.0
Hydropower/OtherRenewable	4.1	4.0
Natural Gas	30.3	24.4
Coal	17.5	23.2

1. Draw two pie graphs showing this data. Use different colors to identify each energy source and neatly label your graphs. Then answer the questions that follow.



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2. What is a primary energy source? Explain how it differs from a secondary source.

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3. Which source decreased the most from 1973 to 1991? Why do you think this happened?

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4. Which source increased the most from 1973 to 1991? Why do you think this happened?

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5. Sunlight, wind, and running water are essentially "free". Yet renewable energy sources are a very small part of our energy consumption. Why is this? Explain.

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**PART B: The data below shows the amount of electricity generated in the United States in 1990 by various renewable energy sources.**

## **1990 United States Renewable Electric Generating Capacity (Gigawatts)**

	<b>Gigawatts</b>	<b>Percent of Total</b>
Hydroelectric	75.1	
Geothermal	0.6	
Biomass (Municipal Waste to Energy)	0.0	
Biomass (other)	6.0	
Solar Thermal	0.4	
Wind	1.4	
<b>TOTAL RENEWABLE</b>	<b>83.5</b>	

1. Draw a bar graph below showing the generating capacity. On the vertical axis, put Electrical Generating Capacity/Gigawatts. On the horizontal axis, put the energy sources. Use different colors and neatly label your graph.



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2. Compute the percent of the total that each resource provides and put the percent in the blanks. Then make a pie graph of the percent data. Use different colors and neatly label the graph.

3. Which renewable source is used the most for producing electricity? Why?

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4. Which renewable energy source above is used the least? Why?

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5. Which renewable source do you think *should* be used the most? Why?

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Source: Alliance to Save Energy and Indiana Department of Education, Energy Environment & Economics