

Generating electricity web quest

This web quest needs to be completed online as the hyperlinks provide the appropriate resources to answer the questions.

HYDROELECTRIC POWER	The Renewable Energy Centre <i>read the page</i> Howstuffworks <i>watch the video</i>
1	How long have we been using water power and what have we used it for? <input type="text"/>
2	What percentage of the world's electricity is produced by hydroelectricity? <input type="text"/>
3	What are the three types of hydroelectric power? <input type="text"/>
4	What are the drawbacks of hydroelectric power? <input type="text"/>

BIOFUELS	BP video <i>watch the video</i> BP <i>read the page</i> RES <i>read the page</i>
1	What is BP making fuel from? <input type="text"/>
2	What is the most abundant organic compound on Earth? <input type="text"/>
3	What is the US mandate for 2022? <input type="text"/>

WIND POWER

[GE Energy video](#)

watch the video

[The Renewable Energy Centre](#)

read the page

[RES](#)

read the page

[Greenpeace](#)

read the page

[BP](#)

read the page

1 How many wind farms are there in the UK?

2 How much power is produced by wind farms in the UK?

3 What are the two types of wind farm?

4 How many homes in the UK are powered by wind?

5 Why does BP focus their effort in the US?

6 Why is it better to build wind farms at sea?

7 How much does the wind power industry grow each year as a percentage?

8 What percentage of the year can a wind turbine produce useful power?

9 What is a typical lifespan for a wind turbine?

PHOTOVOLTAIC CELLS

[Scottish Hydro](#) read the page

[RES](#) read the page

[The Renewable Energy Centre](#) read the page

[BP](#) read the page

1 How much can you save over 25 years by installing photovoltaic cells to your home?

2 How much can you reduce your household carbon footprint by if you install photovoltaic cells to your home?

3 Give some small scale examples of photovoltaic electricity generation

4 How long has BP supplied solar energy for?

5 What could wasted energy be used for in a solar power plant?

GEOHERMAL

[Howstuffworks](#) watch the video

[The Renewable Energy Centre](#) read the page

1 What are the three types of geothermal power station?

2 How much power is generated by geothermal power worldwide?

3 Summarise in three bullet points how it works.

4 How many people use electricity generated by geothermal stations worldwide?

SOLAR HEATING

[The Renewable Energy Centre](#) *read the page*

[Scottish Hydro](#) *read the page*

1 What percentage of household energy is used for heating the house and water?

2 How much can you reduce your household carbon footprint by if you install solar heating systems to your home?

NUCLEAR

[Greenpeace video](#) *watch the video*

[Howstuffworks](#) *watch the video*

1 What does Greenpeace think are the problems with nuclear power?

2 What element are the fuel rods made from?

3 What is the process of an atom splitting called?

4 What particles are used to start the reaction?

5 Is the white smoke from the chimneys dangerous? Why?

6 What are the drawbacks of nuclear power?

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Teacher Notes

HYDROELECTRIC POWER		
1	How long have we been using water power and what have we used it for?	20,000 years ago Grinding wheat
2	What percentage of the world's electricity is produced by hydroelectricity?	20%
3	What are the three types of hydroelectric power?	1. Impoundment; 2. Diversion
4	What are the drawbacks of hydroelectric power?	Impact on fisheries, planning permission, flooding area of countryside (national parks)
WIND POWER		
1	How many wind farms are there in the UK?	217
2	How much power is produced by wind farms in the UK?	3628 MW
3	What are the two types of wind farm?	1. horizontal axis; 2. vertical axis
4	How many homes in the UK are powered by wind?	1.2 million
5	Why does BP focus their effort in the US?	Physical climate and public policy
6	Why is it better to build wind farms at sea?	Less environmental impact, less turbulence
7	How much does the wind power industry grow each year as a percentage?	32%
8	What percentage of the year can a wind turbine produce useful power?	85%
9	What is a typical lifespan for a wind turbine?	20 years
BIOFUELS		
1	What is BP making fuel from?	Sugar cane
2	What is the most abundant organic compound on Earth?	Cellulose
3	What is the US mandate for 2022?	To use 36 billion gallons of biofuels by 2022
SOLAR HEATING		
1	What percentage of household energy is used for heating the house and water?	70%
2	How much can you reduce your household carbon footprint by if you install solar heating systems to your home?	300kg of carbon dioxide
GEOTHERMAL		
1	What are the three types of geothermal power station?	1. Under floor heating 2. Geothermal power generation
2	How much power is generated by geothermal power worldwide?	7000MW
3	Summarise in three bullet points how it works.	1. Heat under earth; 2. Heat water underground
4	How many people use electricity generated by geothermal stations worldwide?	60 Million people

PHOTOVOLTAIC CELLS

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|---|--|---|
| 1 | How much can you save over 25 years by installing photovoltaic cells to your home? | £15,639.75 |
| 2 | How much can you reduce your household carbon footprint by if you install photovoltaic cells to your home? | 800kg of carbon dioxide |
| 3 | Give some small scale examples of photovoltaic electricity generation | phone booths, traffic monitoring, street lighting, road signage |
| 4 | How long has BP supplied solar energy for? | 35 years |
| 5 | What could wasted energy be used for in a solar power plant? | Sea water desalination |

NUCLEAR

- | | | |
|---|---|--|
| 1 | What does Greenpeace think are the problems with nuclear power? | Cleaning up waste is expensive, money should be spent on research for renewables |
| 2 | What element are the fuel rods made from? | Uranium |
| 3 | What is the process of an atom splitting called? | Fission |
| 4 | What particles are used to start the reaction? | Neutrons |
| 5 | Is the white smoke from the chimneys dangerous? Why? | No, it is steam |
| 6 | What are the drawbacks of nuclear power? | Nuclear waste |