Study Guide for the Australian Collaboration Fact and Issue Sheet

CLEAN ENERGY ALTERNATIVES

FOR REVIEW

1. A new energy paradigm

1a. Do you know what 'paradigm' means in the scientific context? If not, look it up in the dictionary.

1b. At the beginning of the Fact and Issue sheet, Alan Pears outlines the need to change the way we think about energy. Can you describe this 'paradigm change' in your own words?

2. Energy supply

2a. Describe the difference between how energy suppliers have historically seen their role and how this might change in the future.

2b. What is the function of base load power stations?

2c. Draw a flow diagram to illustrate the inefficiency of base load power generation as outlined in the Fact and Issue Sheet.

3. Energy storage

3a. Rank the following fuel sources in terms of how easy or difficult it is to store them: solid fuels, electricity, liquid fuels, and gaseous fuels.

3b. Describe three ways in which the storage of electricity has developed recently.

4. Clean energy supply options

4a. Draw a rough pie chart to indicate the proportion of Australia's energy use that goes on heat, movement and electricity.

4b. What are the six types of renewable energy available in Australia? Do you understand what each type, e.g. 'bioenergy' refers to? If not, look up the terms in an encyclopaedia.

4c. What is carbon capture and storage?

4d. What are the two key problems associated with uranium as an energy source?

5. Energy costs

5a. Describe the ways in which the price of different fossil fuels has risen.

5b. Why is the cost of fossil fuels likely to rise further in the future?

5c. What is likely to happen to the cost of renewable energy sources such as solar and wind?

6. Broader issues

6a. Draw an annotated diagram to show the dynamics of Australia's import and export of energy sources.

6b. How can low income or one's place of residence affect access to energy and energy services?

FOR DISCUSSION

1. Prepare a short speech for both the affirmative and negative side of a class debate on the following statement:

"It is useless to try and get people to use less energy. The only thing to do is to find more sources of energy."

2. Question for class discussion:

Given that Australia has one of the world's richest supplies of coal, making it an important part of Australia's export earnings, how can we balance the interests of the national economy with the interests of the global environment?

3. Question for class discussion:

Discuss the pros and cons of geo-sequestration. Does geo-sequestration make coal a 'clean' energy source or does it just sweep the problem under the carpet?

FOR RESEARCH

1. Do a project on the development of geothermal energy in Australia, particularly in the Cooper Basin. You can start your research with the following article from The Age, and then move onto Geoscience Australia:

http://www.theage.com.au/news/in-depth/core-promise-green-energy/2007/09/14/1189276981880.html

http://www.ga.gov.au/minerals/research/national/geothermal/index.jsp

2. Do some research on Government initiatives that might help you and your family make your home more energy efficient. For example, if you live in a house that your family owns, could you install some solar panels or a solar hot water system? What government assistance might help you to do this? If you live in a remote area, what government assistance could you access to help you be self-sufficient in your energy use? If you live in a rented home, see if there are any initiatives specific to improving energy conservation in rented homes. Alternatively, so some research on Government initiatives to improve energy efficiency in schools around Australia.

http://www.climatechange.gov.au/resources/renewable.html

http://www.solaraustralia.com.au/html/faq.htm

http://www.environment.gov.au/programs/greenvouchers/pubs/solar-schools-fact-sheet.pdf

3. For advanced students:

Do a research project outlining the case for and against the use of uranium to generate electricity. You can start your research on the following sites:

http://www.energyscience.org.au/

http://www.world-nuclear.org/info/inf48.html