VCE Systems Engineering Unit 3

**SCHOOL ASSESSED COURSEWORK:** ENERGY

**Topic:** Advantages and Disadvantages of Renewable and Non-renewable Energy (1)

Power point Slide Questions (Slides 1 – 18)

1. What factor determines a non-renewable energy source?
2. Why is nuclear energy considered to be a non-renewable resource?
3. What is the main process used to extract energy from non-renewable sources?
4. What are some common uses for non-renewable energy?
5. What is meant by the term ‘Fossil fuel’?
6. With regards to supply, what is the benefit of renewable energy to humans?
7. What are some of the natural cycles that renewables take advantage of?
8. Which renewable resources still utilise heat to generate electricity?
9. List the big 4 non-renewables.
10. Choose one and describe its uses.
11. List the 3 ways water can be used for power generation.
12. List 5 ways biological materials can be used for energy production.
13. In the table below list the advantages and disadvantages of non-renewable resources

|  |  |
| --- | --- |
| Non-renewables: Advantages | Non-renewables: Disadvantages |
|  |  |

1. In the table below list the advantages and disadvantages of renewable resources.

|  |  |
| --- | --- |
| Renewables: Advantages | Renewables: Disadvantages |
|  |  |

**Topic:** Reducing Carbon emissions in Non-renewables (2)

Power point Slide Questions (Slides 19 – 29)

1. What are the three main approaches to reducing carbon emissions?
2. Which types of globes have replaced very inefficient incandescent globes?
3. To reduce carbon emissions, what fuel is replacing to generate electricity
4. Explain how a hybrid engine works
5. Name 3 other efficiencies used at home
6. What are the 3 capture and storage methods used.
7. Explain the difference between pre and post combustion capture.
8. What happens to the captured CO2?
9. What is gasification?
10. What can the syngas be used for?
11. Explain the extraction of CO2 by algae; what can the end product be used for?
12. Explain the extraction of CO2 by chemical; what can the end product be used for?
13. What is another less efficient method for capturing CO2 and how does it work?

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**Topic:** Harnessing, Comparing and Storing Renewable Energy (3)

Power point Slide Questions (Slides 30 – 55)

1. Explain the following technologies including a simple diagram for each.
2. Hydro power
3. Thermal solar power
4. Wind power
5. Wave power
6. Biofuel
7. Tidal power
8. Biogas
9. Geothermal power
10. List two advantage each for solar, wind and any non-renewables;
11. List two disadvantages each for solar, wind and any non-renewables.
12. Why is renewable energy storage so important?
13. Why is there not as much of an issue with the storage of non-renewables?
14. Briefly explain each of the following energy storage methods;
15. Power banks
16. Solar hydrogen
17. Biogas production
18. Pumped hydro
19. Passive solar water wall
20. Hydraulic hydro storage
21. Compressed air storage
22. Liquid air storage
23. Electric Vehicle Storage

**Topic:** Factors that determine the Efficiency of Energy Conversion (4)

Power point Slide Questions (Slides 56 – 58)

1. According to Newton, can energy be created or destroyed?
2. What is one thing you can be certain of with the conversion of energy?
3. What is the most common waste energy with energy conversion?
4. Identify the energy transformations for thermal power generation.
5. Why are the number of energy transformations an important factor for the generation of energy?
6. What are some efficiency factor affecting the power generation in coal fired plants?
7. What conflicts are there with the generation of ethanol and bio-fuels on farmland?
8. What impacts the efficiency of the use of solar apart from the day/ night cycle?
9. Why is drag a positive and negative factor in relation to wind turbines?

**Topic:** Comparison of wind, solar and non-renewable energy generation (5)

Power point Slide Questions (Slides 42 – 44)

1. What advantages does solar power generation have over wind power?
2. What advantages does wind power generation have over solar power?
3. What advantages does non-renewable power have over both wind and solar?

**Topic:** Transformations of the life cycle of power supply (6)

Power point Slide Questions (Slides 59 – 65)

1. Explain the process and the energy transformations of turning coal into electricity.
2. What then is the process of running your computer from the power generated at the coal fired power station.
3. Compare the number of energy transformation between coal and hydro generated power.
4. What can a fuel cell do?
5. What are the by-products of a fuel cell?