

Name _____

Date _____

Climate 1

1. Define the *energy density* of a fuel.

2. Number the fuels listed below in order of highest (1) to lowest (5) energy density.

Coal

Oil and Gas

Wood and Biomass

Nuclear Fuel

Fusion Fuel

3. When a car is driving at 80km/h, it is doing work against air resistance at a rate of 40kW.

- A. How far will the car travel in 1 hr?
- B. How much work does the car do against air resistance in 1 hr?
- C. If the engine of a modern diesel car is 75% efficient, how much energy must the car get from the fuel?
- D. If the energy density of diesel is 45.8 MJ kg^{-1} , how many kg of diesel will the car use?
- E. If the density of diesel is 0.9 kg/litre, how many litres will the car use?
- F. Calculate the litres of fuel used per kilometre.

4. A coal-fired power station gives out 1000 MW of power.

- A. How many joules will be produced in one day?
- B. If the efficiency is 40%, how much energy goes in?
- C. The energy density of coal is $32.5 \text{ MJ} \cdot \text{kg}^{-1}$. How many kg are used?
- D. How many rail trucks containing 100 tonnes each are delivered per day?