

Option C.1 Energy Sources

Understandings:

- A useful energy source releases energy at a reasonable rate and produces minimal pollution.
- The quality of energy is degraded as heat is transferred to the surroundings. Energy and materials go from a concentrated into a dispersed form. The quantity of the energy available for doing work decreases.
- Renewable energy sources are naturally replenished. Non-renewable energy sources are finite.
- Energy density = $\frac{\text{energy released from fuel}}{\text{volume of fuel consumed}}$.
- Specific energy = $\frac{\text{energy released from fuel}}{\text{mass of fuel consumed}}$.
- The efficiency of an energy transfer = $\frac{\text{useful output energy}}{\text{total input energy}} \times 100\%$.

Applications and skills:

- Discussion of the use of different sources of renewable and non-renewable energy.
- Determination of the energy density and specific energy of a fuel from the enthalpies of combustion, densities and the molar mass of fuel.
- Discussion of how the choice of fuel is influenced by its energy density or specific energy.
- Determination of the efficiency of an energy transfer process from appropriate data.
- Discussion of the advantages and disadvantages of the different energy sources in C.2 through to C.8.