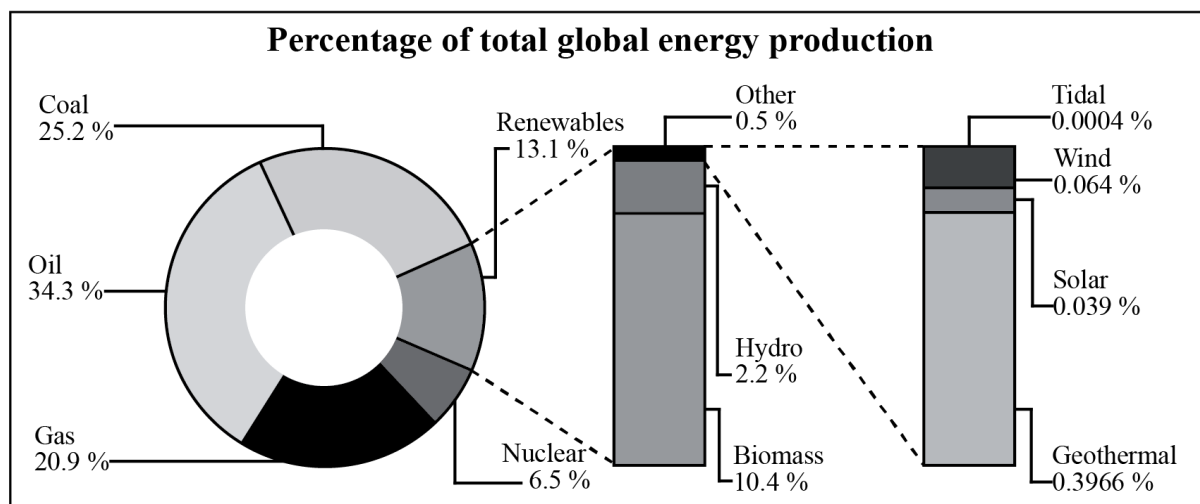


Renewable Energy [14 marks]

The graph shows the different sources of global energy production.



[Source: Sunlit uplands, *The Economist* May 31 2007, The Economist Newspaper Limited. Reproduced with permission.]

1. Identify and rank the top **three** renewable sources of energy shown on the graph from highest to lowest. [2 marks]

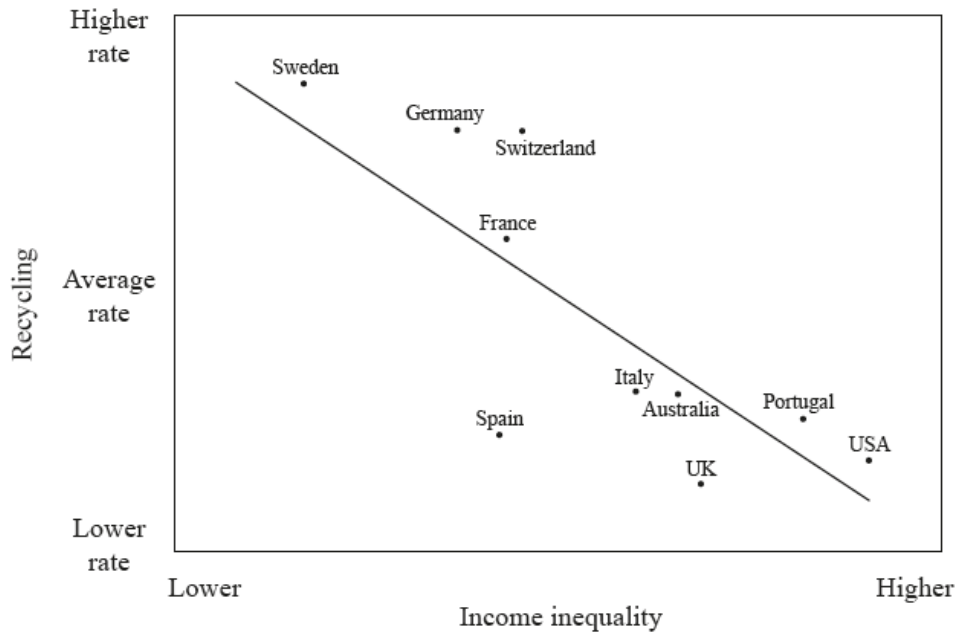
Markscheme

The top three are: biomass, hydro and geothermal, in that order [2 marks].

Award 1 mark if all three are identified, but not ranked correctly, or if any one of the three are incorrectly identified. No credit may be given if only one of the three is correct.

4. Patterns in resource consumption

The graph shows income inequality and recycling rates for selected high-income countries in 2010.



[Source: ©The Equality Trust. Used with permission.]

2. Explain **two** disadvantages of **one named** source of renewable energy.

[4 marks]

Markscheme

Award **[1 mark]** for each valid disadvantage and **[1 mark]** for explanation/exemplification.

The disadvantages depend on the choice of energy source.

Possible disadvantages:

The cost of development; the distance that power (electricity) has to be transmitted from where the resource is available; the reduction in landscape aesthetic values (eg, in the case of land-based wind farms); unreliable supply, dependent on weather and other conditions, meaning that the resource is not available at all times, or not available to meet peak demand times.

For example, if a candidate chooses "solar power", the two disadvantages might be: (a) not suited to certain regions of the world (eg, higher latitude areas), or certain seasons (winter), and (b) installation costs remain relatively expensive.

If no valid named renewable energy source, but disadvantages are analysed, award a maximum of **[2 marks]**.

Accept nuclear power as a renewable energy source.

The table ranks the ten countries which had the largest oil consumption in 2010.

| Rank | Country | Oil consumption (thousands of barrels/day) |
|------|--------------|--|
| 1 | USA | 19 148 |
| 2 | Country A | 9057 |
| 3 | Japan | 4451 |
| 4 | India | 3319 |
| 5 | Russia | 3199 |
| 6 | Saudi Arabia | 2812 |
| 7 | Brazil | 2604 |
| 8 | Germany | 2441 |
| 9 | South Korea | 2384 |
| 10 | Canada | 2276 |

[Source: *BP Statistical Review of World Energy* June 2011]

3. Suggest **two** reasons why sources of renewable energy have become more important in many countries in recent years. [4 marks]

Markscheme

Award **[1 mark]** for each valid reason, and an additional **[1 mark]** for its development, exemplification or further explanation.

Possible reasons could include:

- adoption of a green agenda
- energy security
- the desire to increase sustainability
- the declining availability and/or rising costs of fossil fuels
- the need to avoid global warming
- meeting pledges, for example, Kyoto-Copenhagen
- an increased investment in renewable energy technologies
- technological breakthroughs that have reduced the costs of renewable energy infrastructure
- alternative to nuclear since Fukushima.

4. Suggest **two** reasons why some areas of the world are unlikely to depend entirely on renewable energy sources. [2x2 marks]

Markscheme

Award 1 mark for each basic reason, with additional 1 mark for extension and/or exemplification.

Answers can suggest reasons with validity at any scale: local, regional or national. Possible reasons include: abundant reserves of fossil fuels; insufficient capital to develop alternative energies; conscious decision to rely on nuclear power; need for portable, emergency sources of power; lack of sufficient opportunities for renewable energy; lack of political will; lack of local conditions for any renewable energy.
