

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Class: \_\_\_\_\_

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## IB ESS

# 7.1 Energy Choices and Security

### Significant ideas:

There is a range of different energy sources available to societies that vary in their sustainability, availability cost and socio-political implications.

The choice of energy source is controversial and complex. Energy security is an important factor in making energy choices.



# Energy Supply

1. Complete the table below listing the energy sources in the relevant row.

*solar*    *biomass*    *fossil fuels*    *hydropower*    *nuclear fission*  
*wind*    *wave*    *tidal*    *geothermal*

Energy Source	Pollution	Renewable/Non-renewable?
	Little/no pollution	Renewable
	Little/no pollution	Renewable
	Little/no pollution	Renewable
	Little/no pollution	Renewable
	Little/no pollution	Renewable
	Little/no pollution	Renewable
	Releases greenhouse gases, but this is offset by new growth	Potentially renewable
	Releases greenhouse gases contributing to global warming	Non-renewable
	Generates radioactive waste	Non-renewable

2.

a) It is predicted that fossil fuel use will continue to rise in the future. Explain why this might be.

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b) State roughly how many more years of supply there is estimated to be of fossil fuels:

**Coal:** \_\_\_\_\_ years

**Oil:** \_\_\_\_\_ years

**Natural Gas:** \_\_\_\_\_ years



3. Give reasons why consumption of fossil fuels *might* decrease in future, even before these resources run out.

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## Energy Choices and Security

1. Societies must make choices as to how they provide their required energy. List the factors that may influence a nation's energy choices.

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2. Explain how energy choices might influence the independence of a nation.

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3. Define "Energy Security".

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4.

a) Complete the table on the next page listing reasons why a nation may have greater or lower energy security. Use the phrases listed, but also add your own ideas.

- Most energy from fossil fuel imports
- A windy climate
- Large oil fields present in the country
- A cold climate: little sunlight and wind
- Advanced knowledge and of and technology for nuclear fission
- A sunny climate
- A nation with a wide coastline
- Most energy supplied via renewable from a slightly politically hostile nation
- Geologically active land
- An MEDC



Factors that give a nation greater energy security	Factors that give a nation lower energy security
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b) Explain your decision to put MEDC in the category you have chosen.



5.

a) Explain how the distribution of energy sources may lead to conflict.

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b) Explain, using specific nations as examples, how future changing energy uses could lead to conflict. You can speculate about future political relationships, but your speculations must be supported by evidence as well as sensible predictions.

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6. Use the information in the table to **evaluate the energy security of nations A and B**. (The information for nation C is useful background information). In your answer you should **state which nation (A or B) is "more secure"** and support your opinion.

Nation A	Nation B	Nation C
<ul style="list-style-type: none"> <li>• Democratic government</li> <li>• Primary source of energy is from oil, traded from Nation C.</li> <li>• Nation A and C have similar cultures and a long history of trade and cooperation.</li> <li>• Very little of any fossil fuels available within its own borders.</li> <li>• The government previously invested in nuclear research but mass protests following a minor accident have resulted in a complete halt to all nuclear power. 0% of the energy comes from nuclear sources.</li> <li>• Wind turbines are used widely, though the climate varies and there are "windy seasons".</li> <li>• Investing heavily in solar energy, though insolation is unpredictable.</li> </ul>	<ul style="list-style-type: none"> <li>• Dictatorship.</li> <li>• Relies primarily on large crude oil fields within its own borders.</li> <li>• About 20% of the energy supply is from nuclear energy</li> <li>• Climate is ideal for harvesting solar energy. Currently 2% of energy is solar, but little investment being made into solar power methods.</li> <li>• A heavily industrialised nation with large energy demands.</li> </ul>	<ul style="list-style-type: none"> <li>• Democratic government</li> <li>• Strong ties with Nation A; a long history of trade and cooperation.</li> <li>• Significant differences in cultural and religious ideals have resulted in a history of war with Nation B until mid 20<sup>th</sup> century. Relationship is improving and some trade agreements now exist.</li> <li>• Huge oil and natural gas reserves.</li> <li>• Investing heavily in fracking, though this has been portrayed negatively in the primarily left-wing media. Protests and social media campaigns are relatively common.</li> </ul>

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Lined writing area for student responses.

