

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

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## Pearson Edexcel Level 1/Level 2 GCSE (9–1)

**Friday 16 June 2023**

Afternoon (Time: 1 hour 30 minutes)

Paper  
reference

**1GB0/03**



### Geography B

#### PAPER 3: People and Environmental Issues Making Geographical Decisions

##### You must have:

Resource Booklet (enclosed)  
Calculator

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*

### Information

- The total mark for this paper is 64.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*
- The marks available for spelling, punctuation and grammar are clearly indicated.

### Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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## SECTION A

### People and the Biosphere

**Answer ALL questions. Write your answers in the spaces provided.**

**Some questions must be answered with a cross in a box . If you change your mind about an answer, put a line through the box  and then mark your new answer with a cross .**

1 Use Section A (pages 2, 3 and 4) in the Resource Booklet to answer this question.

(a) Study Figure 1.

(i) Name the ecosystem which covers the largest area of land in Figure 1.

(1)

---

(ii) Identify **two** statements which correctly describe the past distribution of forest on the map in Figure 1.

(2)

- A The forest was fairly evenly distributed
- B Forests grew mainly in central areas of Iceland
- C Forests grew mainly near the edges of the land
- D More forest was in the south-east of Iceland
- E More forest was in the south-west of Iceland

(b) Using your own knowledge, name **one** forest biome that is **not** present in Iceland.

(1)

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(c) Using evidence from Figures 1 and 2, suggest **two** ways in which Iceland's physical geography influences the distribution of its ecosystems.

(4)

1 .....

.....

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2 .....

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**(Total for Question 1 = 8 marks)**

**TOTAL FOR SECTION A = 8 MARKS**



## SECTION B

### Forests Under Threat

**Answer ALL questions. Write your answers in the spaces provided.**

**Some questions must be answered with a cross in a box . If you change your mind about an answer, put a line through the box  and then mark your new answer with a cross .**

**2** Use Section B (page 5) in the Resource Booklet to answer this question.

(a) Study Figure 3.

(i) Which **one** of the following is the best definition of biodiversity?

(1)

- A** The percentage of forest which has been removed
- B** The different forests found in a country
- C** The rate of nutrient cycling in an ecosystem
- D** The number of plant and animal species

(ii) Using Figure 3 and your own knowledge, explain **one human** reason and **one physical** reason why very little of Iceland's forest remains.

(4)

Human reason

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Physical reason

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(b) Study Figure 4.

Using Figure 4 and your own knowledge, explain **one** possible impact of replanting forests on Iceland's economy.

(2)

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(c) Using your own knowledge, explain **one** way in which trees in the taiga biome are adapted to the climate.

(2)

.....  
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**(Total for Question 2 = 9 marks)**

**TOTAL FOR SECTION B = 9 MARKS**



## SECTION C

### Consuming Energy Resources

**Answer ALL questions. Write your answers in the spaces provided.**

**Some questions must be answered with a cross in a box . If you change your mind about an answer, put a line through the box  and then mark your new answer with a cross .**

**3 Use Section C (pages 6 to 10) in the Resource Booklet to answer this question.**

(a) Study Figure 5.

(i) Identify the sector which employs most people.

(1)

(ii) Identify the sector which is **most clearly** shown as being threatened by climate change.

(1)

(b) Study Figure 6.

(i) Calculate the value of **X** in the table.

(1)

**A** 78

**B** 61

**C** 19

**D** 13

(ii) Using your own knowledge, state **one** possible **political** cause of a large global oil price increase.

(1)



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(c) A country's 'energy mix' is the range of different energy sources used by its people and industries.

Using evidence from Figures 5 and 6, explain **two** reasons why the people of Iceland need a diverse energy mix.

(4)

1

2



P 7 2 5 7 1 A 0 7 2 0

(d) Study Figure 7.

Identify the interquartile range of the data.

(1)

- A 76 – 7
- B 75 – 17
- C 53 – 15
- D 33 – 16

(e) Using your own knowledge, explain **one physical** and **one political** reason why some countries produce little renewable energy.

(4)

Physical reason

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Political reason

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(f) Study Figure 8.

Using evidence from Figure 8, assess the **environmental** impacts of renewable energy use in Iceland.

(8)



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(g) Study Figure 9.

(i) Identify the year when Iceland's annual average temperature was highest.

(1)

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(ii) Using Figure 9, identify **one** reason why climate change leads to the loss of Arctic fish species.

(1)

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(h) Study Figure 10.

Assess the value of Iceland's Climate Action Plan as a strategy that **other countries** could also use.

(8)



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**(Total for Question 3 = 31 marks)**

**TOTAL FOR SECTION C = 31 MARKS**



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## SECTION D

## Making a Geographical Decision

**Answer Question 4. Write your answers in the space provided.**

**In this question, up to four additional marks will be awarded for your spelling, punctuation, grammar and your use of specialist terminology.**

4 Study the three options below for Iceland's government to manage the country's natural environment and resources more sustainably.

**Option 1:** Make new laws to limit the harm done by aluminium production.

**Option 2:** Increased planting of new trees to replace Iceland's lost taiga forest.

### **Option 3:** Take action to reduce fossil fuel use by transport in Iceland.

Select the option you think Iceland's government ought to focus on **first**.

Justify your choice.

Use information from the Resource Booklet and knowledge and understanding from the rest of your geography course to support your answer.

(12)

## Chosen option



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**(Spelling, punctuation, grammar and use of specialist terminology = 4 marks)**  
**(Total for Question 4 = 16 marks)**

**TOTAL FOR SECTION D = 16 MARKS**  
**TOTAL FOR PAPER = 64 MARKS**



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## **Geography B**

**PAPER 3: People and Environmental Issues**

**Making Geographical Decisions**

**Resource Booklet**

**Do not return this Booklet with the question paper.**

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## SECTION A

### People and the Biosphere

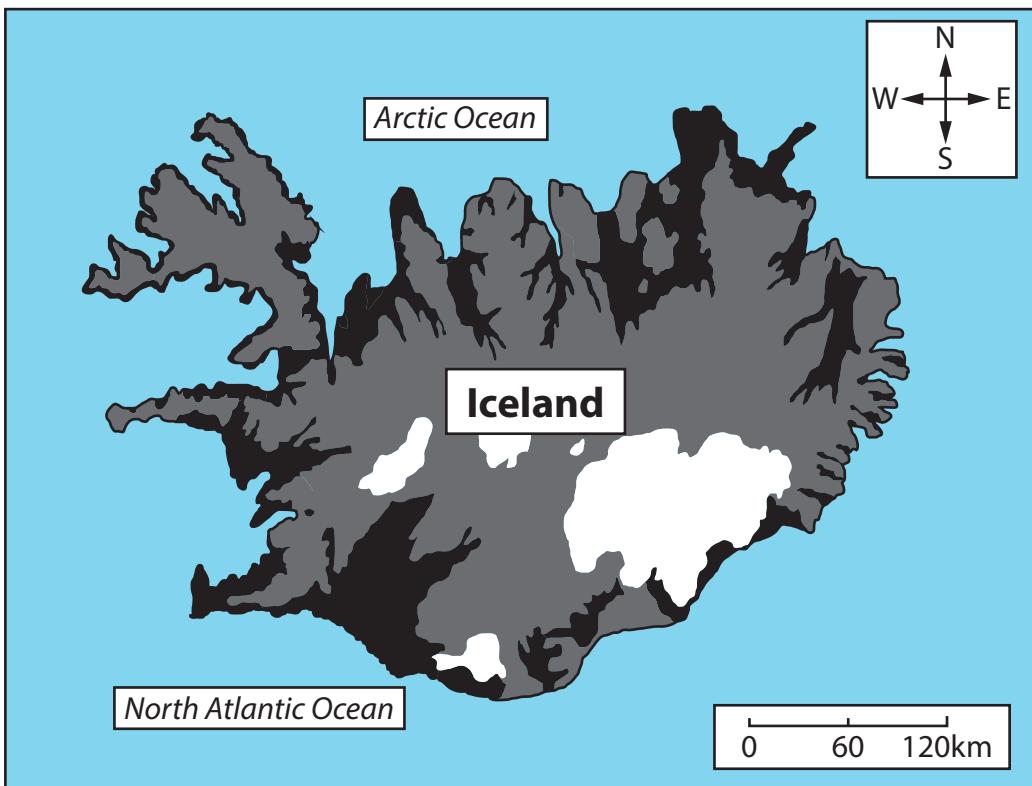
The issue: **a sustainable future for Iceland.**

- The European country of Iceland is a volcanic island in the North Atlantic Ocean. Large areas of Iceland are an uninhabited wilderness.
- In 2019, Iceland's 350,000 citizens had an average life expectancy of 84 and a very high Gross Domestic Product (GDP) per capita of 55,000 US\$.
- Environmental impacts of Iceland's past economic growth include deforestation, soil erosion and pollution. The environment is now threatened by climate change.
- How can Iceland's government ensure a sustainable future not only for its people but also for Iceland's physical environment?

### Introduction

- Iceland lies on a boundary between two tectonic plates. Volcanic activity has created a dramatic mountainous landscape which attracts tourists. Glaciers cover many of the island's high mountains and volcanoes.
- This environment provides plentiful renewable energy. Firstly, seasonal meltwater from glacial ice is used to create hydroelectric power (HEP). Secondly, volcanic activity generates ground heat that can be a power source – this is called geothermal energy.
- Some transnational corporations (TNCs) have been attracted to Iceland by its cheap electricity. These TNCs make aluminium and provide jobs but also have an environmental and climate impact.
- Carbon dioxide is also produced by Iceland's many large fishing boats and the tourist aeroplanes on which its economy depends.
- The carbon footprint of Iceland's citizens is one of the world's largest. An Icelandic politician recently admitted: "If everybody lived like Icelanders, we would need six planets."





Key

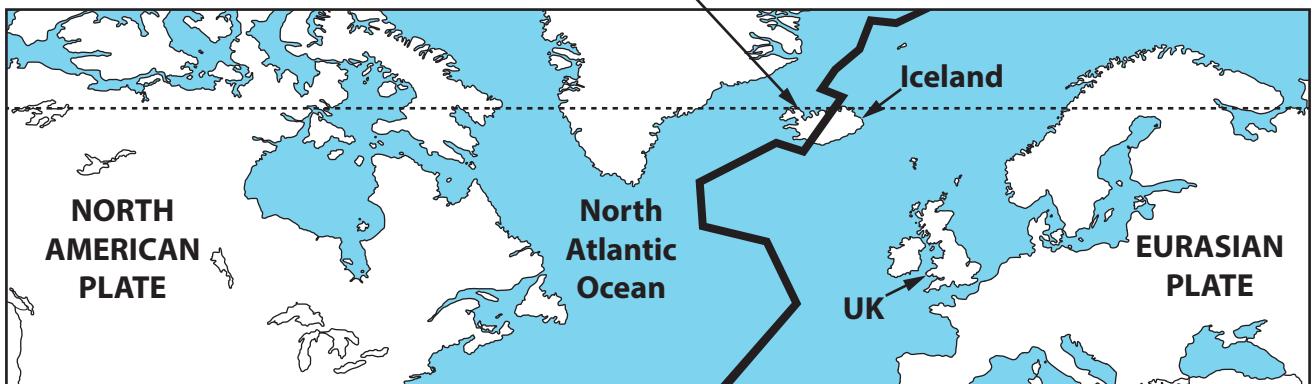
|  |              |
|--|--------------|
| <span style="background-color: #808080; display: inline-block; width: 15px; height: 15px;"></span> | Tundra       |
| <span style="background-color: white; display: inline-block; width: 15px; height: 15px;"></span>   | Glaciers     |
| <span style="background-color: black; display: inline-block; width: 15px; height: 15px;"></span>   | Taiga forest |

- Parts of Iceland were originally covered with a type of taiga (boreal) forest composed of birch, pine, and spruce trees.
- 1,100 years ago, when humans first sailed to Iceland from mainland Europe, around 25 per cent (%) of Iceland was still forested. Tundra vegetation or glaciers covered other areas.

**Figure 1**

**Iceland's ecosystems before humans first arrived 1,100 years ago**

Iceland is located on a divergent plate boundary.



Key

- Mid-Atlantic Ridge (a tectonic plate boundary)
- - - Arctic Circle



Some highland areas in central Iceland are covered with ice.

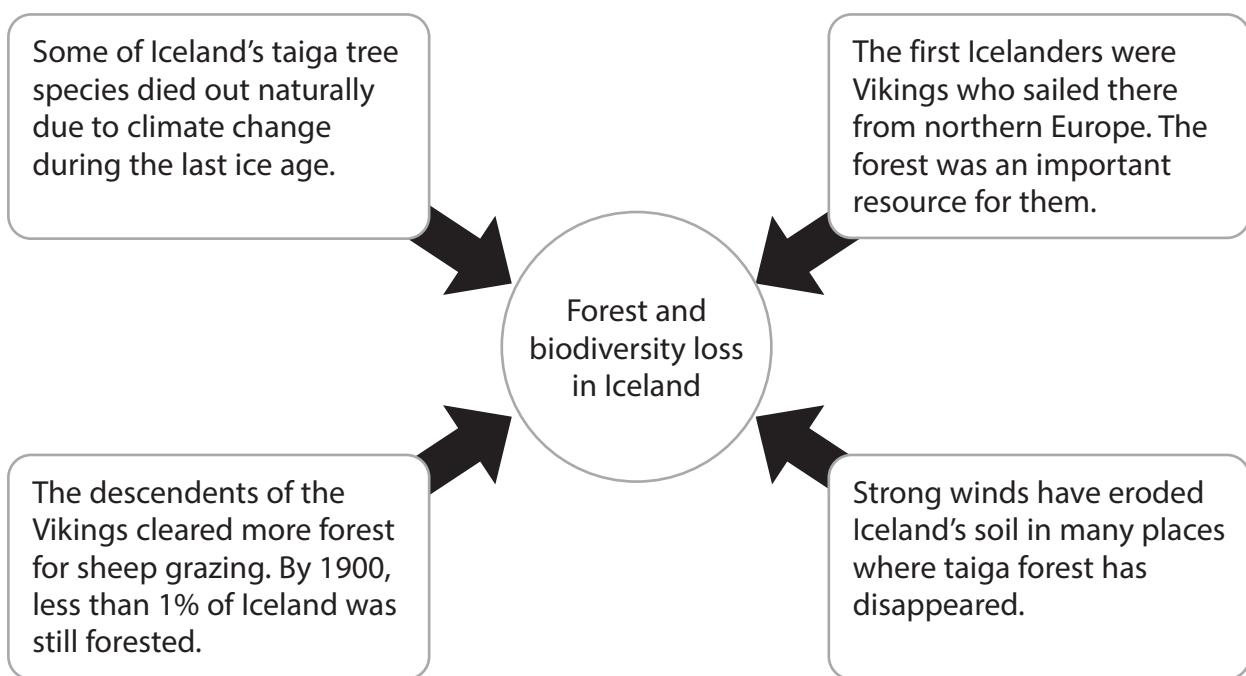


Iceland is an active volcanic hotspot.

**Figure 2**  
**The location and physical geography of Iceland**

## SECTION B

### Forests Under Threat



**Figure 3**  
**Causes of forest and biodiversity loss in Iceland**

| Economic benefits   | Environmental benefits  | Social benefits   |
|---|---|---|
| <ul style="list-style-type: none"><li>• Wood production</li><li>• Forestry work</li></ul> | <ul style="list-style-type: none"><li>• Biodiversity gains</li><li>• Soil protection</li><li>• Carbon storage</li></ul> | <ul style="list-style-type: none"><li>• Recreation</li><li>• Flood risk reduction</li></ul> |

- Iceland's government plans to replant half of Iceland's lost taiga forest by 2100. 3 million fast-growing pine trees are planted each year.
- Not everyone supports forest replanting because it changes the landscape that international tourists want to see. New forest can create many benefits though.

**Figure 4**  
**Replanting Iceland's forest**

## SECTION C

### Consuming Energy Resources

| Sector                  | % of Iceland's earnings | Characteristics of sector (2018 data)  | Threats to sector  |
|-------------------------|-------------------------|--|--|
| Fishing & food          | 27                      | <ul style="list-style-type: none"> <li>• 5,000 people work on fishing vessels.</li> <li>• 20,000 people work in food processing or support roles like ship repairs.</li> </ul> | <ul style="list-style-type: none"> <li>• Marine ecosystem health is threatened by rising ocean temperatures.</li> <li>• Some species may vanish altogether.</li> </ul> |
| Tourism                 | 33                      | <ul style="list-style-type: none"> <li>• 27,000 people work in air travel, hotels, coaches and visitor attractions.</li> <li>• 3 million tourists visited in 2018.</li> </ul>  | <ul style="list-style-type: none"> <li>• Almost all tourists arrive by air.</li> <li>• Volcanic eruptions and major global events can affect air travel.</li> </ul>    |
| Aluminium manufacturing | 36                      | <ul style="list-style-type: none"> <li>• 4,000 people work in aluminium metal production.</li> <li>• The factories are mainly owned by foreign TNCs.</li> </ul>                | <ul style="list-style-type: none"> <li>• TNCs might relocate elsewhere if costs in Iceland rise.</li> <li>• Demand is linked to global economic growth.</li> </ul>     |



**Figure 5**

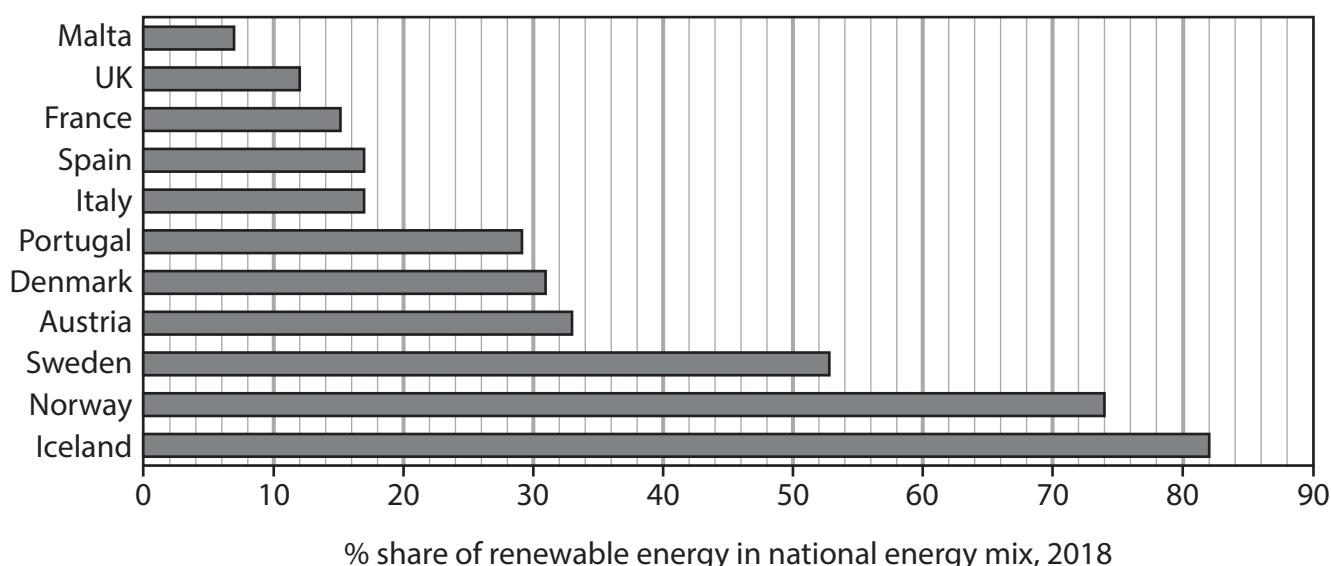
**Information about Iceland's three main economic sectors and its capital city, Reykjavik**



| % contribution to Iceland's energy mix |                     |                   |              |               |
|--|---------------------|-------------------|--------------|---------------|
| YEAR                                   | Hydroelectric power | Geothermal energy | Imported oil | Imported coal |
| 2005                                   | 18                  | 56                | 23           | 3             |
| 2010                                   | 19                  | 66                | X            | 2             |
| 2018                                   | 20                  | 62                | 16           | 2             |

- A country's 'energy mix' is the range of different energy sources that are used.
- Fossil fuel use for making electricity has fallen as renewable energy sources have increased. However, oil is still needed for shipping, aeroplanes and road vehicles.
- Renewable energy was developed rapidly in the 1970s when Iceland could not afford to import the oil it needed because of a large global price increase.
- Hydroelectric power (HEP) was developed by building large dams and reservoirs.
- Geothermal energy was developed by drilling into rock and drawing up hot water. Electricity can be generated using steam from this water. 90% of Icelandic houses are now heated using geothermal energy.

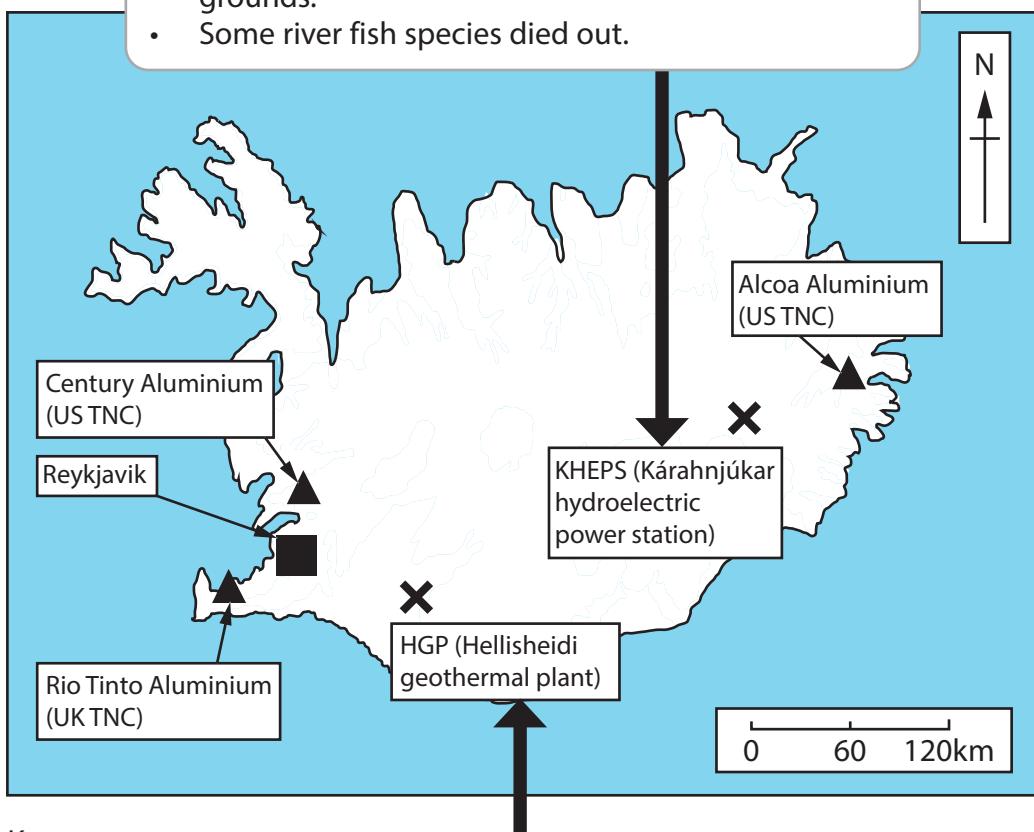
**Figure 6**  
**An energy profile of Iceland**



The United Nations has described Iceland's use of renewable energy as:  
"A model for the world."

**Figure 7**  
**Renewable energy use by selected European countries, 2018**

- A large area of land was flooded to create the reservoir at KHEPS.
- Iceland's wild reindeer and geese lost their breeding grounds.
- Some river fish species died out.



#### Key

- ✗ Renewable energy source
- ▲ Aluminium production
- Capital city

- As hot water is drawn to the surface at HGP, it brings sulphur and nitrogen gases which cause soil and air pollution.
- Health problems in Reykjavik may be linked to HGP.

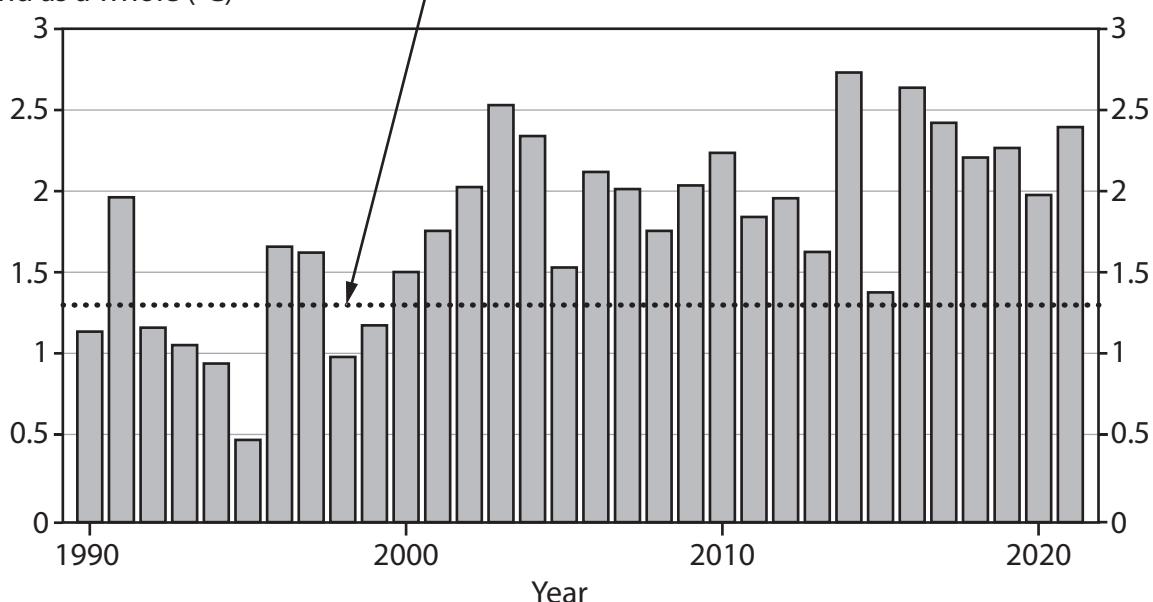
- TNCs produce aluminium at coastal sites close to power stations. Rocks containing a mineral called bauxite are shipped to Iceland where they are processed to make aluminium. Three-quarters of all Iceland's electricity is used in this process.
- Aluminium is Iceland's most valuable export. It is used to make cars, aeroplanes and phones. Very few countries produce more aluminium than Iceland.
- The TNCs are attracted by low taxes and low energy prices set by Iceland's government.

**Figure 8**

**Information about renewable energy and aluminium production in Iceland**

Average annual temperature for Iceland as a whole (°C)

The normal average annual temperature of Iceland during the 1900s was 1.3°C



- Climate change is causing the temperature to rise even faster in Arctic areas than in many other parts of the world.
- Changes in ocean water temperature mean that Arctic fish species such as cod may vanish due to habitat loss.

**Figure 9**

**Temperature rises in Iceland and other Arctic regions, 1990–2021**

|   |   | Category            | Climate Action Plan goals  |
|---|---|---------------------|--|
| 1 |  | Roads & shipping    | <ul style="list-style-type: none"> <li>Reduce emissions from road traffic by 20% and from shipping by 40%.</li> <li>Ban new petrol and diesel vehicles after 2030.</li> </ul>  |
| 2 |  | Aircraft & industry | <ul style="list-style-type: none"> <li>Join global efforts to reduce aircraft emissions.</li> <li>Develop carbon capture and storage (CCS) technology.</li> <li>Reduce emissions by 43% in line with European Union (EU) targets.</li> </ul> |
| 3 |  | Energy production   | <ul style="list-style-type: none"> <li>Promote and support renewable energy.</li> <li>Reduce emissions from energy production by 43%.</li> <li>Encourage citizens to conserve energy.</li> </ul>   |
| 4 |  | Forestry & land use | <ul style="list-style-type: none"> <li>Replanting enough new taiga trees to increase carbon storage by 500%.</li> </ul>  |

Although Iceland's overall emissions have fallen by one-third since 1970, the average carbon footprint size of an Icelandic citizen remains almost double that of a UK citizen. As a result, new Climate Action Plan goals for 2030 have been introduced.

**Figure 10**

**New Climate Action Plan goals introduced by Iceland's government in 2020**



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### **Acknowledgements**

Pearson Education Ltd. gratefully acknowledges all the following sources used in the preparation of this paper:

Figure 1 adapted from <https://www.cbd.int/doc/world/is/is-nr-01-en.pdf>

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© fogcatcher/Shutterstock

Figure 5 © Christopher Kane/Shutterstock

Figure 7 based on: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Share\\_of\\_energy\\_from\\_renewable\\_sources\\_2018\\_infograph.jpg](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Share_of_energy_from_renewable_sources_2018_infograph.jpg)

Figure 8 adapted from: <https://www.savingiceland.org/2017/08/icelands-troubled-environment/>

Figure 9 adapted from: <https://tradingeconomics.com/iceland/temperature>

Figure 10 adapted from <https://www.gov.is/library/01-Ministries/Ministry-for-The-Environment/201004%20Umhverfisraduneytid%20Adgerdaaetlun%20EN%20V2.pdf>

