Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

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

Thursday 11 June 2020

Morning (Time: 1 hour 30 minutes) | Paper Reference **1GB0/03**

Geography B

Paper 3: People and Environment 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.*
- Where asked you must **show all your working out** with **your answer clearly identified** at the **end of your solution**.

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, grammar and use of specialist terminology 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 and 3) in the Resource Booklet to answer this question.

(a) Study Figure 1 which shows Russia's biomes (large-scale ecosystems).

(i) Identify **two** features of the **distribution** of taiga (boreal forest).

(2)

1 .....

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2 .....

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(ii) Define the term **ecosystem**.

(1)

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(b) Identify the range of animal species in Figure 1.

(1)

☐ **A** 4,500 – 900

☐ **B** 4,500 – 500

☐ **C** 3,500 – 1,200

☐ **D** 1,200 – 500

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(c) State **two** ways in which climate affects the global distribution of biomes.

(2)

1 .....

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2 .....

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(d) Explain **one** way in which vegetation helps soil to develop.

(2)

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(Total for Question 1 = 8 marks)

TOTAL FOR SECTION A = 8 MARKS

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SECTION B

Forests Under Threat

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

2 Use Section B (pages 4 and 5) in the Resource Booklet to answer this question.

(a) Study Figure 2. It shows facts about carbon storage in different biomes.

(i) Identify Forest biome X.

(1)

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(ii) One benefit of forest conservation is that carbon is stored in vegetation.

Using Figure 2, explain **one other** benefit of forest conservation.

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(b) Study Figures 1, 2 and 3 in the Resource Booklet.

Explain **two** reasons why the development of oil and gas may threaten parts of Russia's taiga (boreal forest).

(4)

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(Total for Question 2 = 7 marks)

TOTAL FOR SECTION B = 7 MARKS

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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 6–11) in the Resource Booklet to answer this question.

(a) Study Figure 4. It shows a timeline of changing oil prices and Russia's gross domestic product (GDP) per capita.

(i) Identify Russia's maximum GDP per capita during the period 1997 to 2017.

(1)

US$.....

(ii) Identify when the price of oil fell by approximately 50%.

(1)

☒ **A** 1997–1998

☒ **B** 2008–2009

☒ **C** 2009–2010

☒ **D** 2014–2015

(iii) Identify **one** economic cause of falling oil prices shown in Figure 4.

(1)

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(iv) Identify **one** political cause of rising oil prices shown in Figure 4.

(1)

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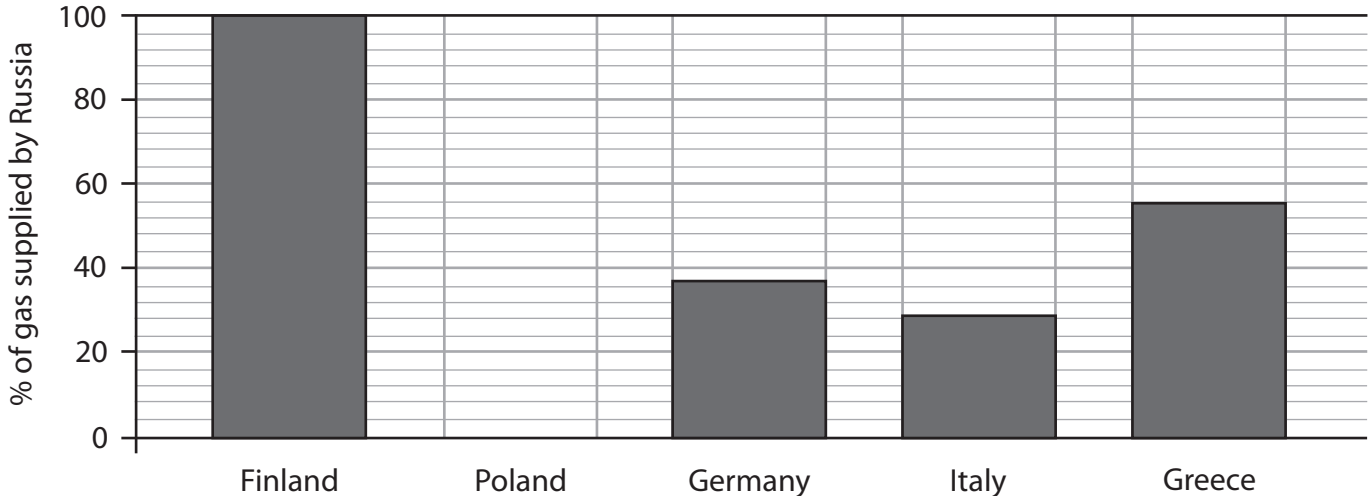
(b) Study Figures 5, 6 and 7 in the Resource Booklet which show Russia's relationships with other countries.

(i) Draw the bar for Poland on the graph below using data from Figure 5.

(1)



(ii) Explain **one** way in which the news headlines in Figure 6 could have affected sales of Russian gas to other countries.

(2)

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(iii) Explain **one** way in which the 'Power of Siberia' pipeline shown in Figure 7 might affect sales of Russian gas to other countries.

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(c) Study Figure 8 in the Resource Booklet which shows countries where Russian energy companies are developing new oil and gas resources.

Suggest **two** ways in which the natural environment of these countries could affect the cost of developing their oil and gas resources.

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(d) Study Figure 9 in the Resource Booklet.

Using evidence from Figure 9, assess the challenges facing Russia's **own** energy companies.

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(e) Renewable and recyclable energy resources can be used instead of non-renewable fossil fuels.

(i) Explain what is meant by **renewable energy resources**.

(2)

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(ii) Explain what is meant by **recyclable energy resources**.

(2)

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(f) Study Figure 10 in the Resource Booklet.

Using evidence from Figure 10, assess the influence of physical and human factors on the development of wind energy resources.

(8)

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(Total for Question 3 = 33 marks)

TOTAL FOR SECTION C = 33 MARKS

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SECTION D

Making a Geographical Decision

Answer Question 4. Write your answer in the space provided.

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

4 Study the three options below that the Russian government can choose from to help Russia adapt to the rapid decline of its conventional oil and gas reserves.

Option 1: Focus mainly on developing wind energy on a large scale.

Option 2: Focus mainly on developing Russia's own unconventional oil and gas resources.

Option 3: Focus mainly on developing fossil fuel resources located in other countries.

Select the option that you think is the best plan for Russia's economy.

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 Environment Issues – Making Geographical Decisions

Resource Booklet

Do not return this Booklet with the question paper.

Turn over

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SECTION A

People and the Biosphere

The issue: Russia's energy future

- Russia's economy depends on sales of energy to other countries, but its conventional oil and gas resources will start running out soon.
- Russia still has plentiful supplies of unconventional fossil fuels, such as shale gas, but these are difficult and expensive to exploit. They are also in ecologically sensitive areas.
- One response of Russian energy companies is to make money by developing new oil and gas resources in Africa, South America and Asia.
- Given its vast land area, Russia could one day develop wind energy on a large scale.

Introduction

- Russia (also called the Russian Federation) is the world's largest country, covering an area of 17 million square kilometres. Its diverse physical environment ranges from Arctic tundra to hot deserts. Russia's taiga (boreal forest) is the Earth's largest forest, bigger even than the Amazon rainforest.
- Below Russia's varied ecosystems lie major oil and gas resources. However, some could be hard to develop without new technologies and international cooperation.
- Following major political changes in the 1980s, Russia's economy became over-reliant on exports of oil and gas. In turn, many countries now depend on Russia for energy imports, mainly delivered by pipeline.
- Russia's recent actions have created global political tensions. In 2014, Russia took control of part of Ukraine, a neighbouring country. To show disapproval, the European Union (EU) and United States (US) introduced barriers to trade (called sanctions) designed to hurt Russia's economy.
- One impact of these sanctions is that EU and US energy companies are no longer allowed to help develop Russia's shale gas and other unconventional fossil fuels.

Key:

- Tundra
- Taiga (boreal) forest
- Temperate forest
- Temperate grassland
- Desert

km
0 1,000

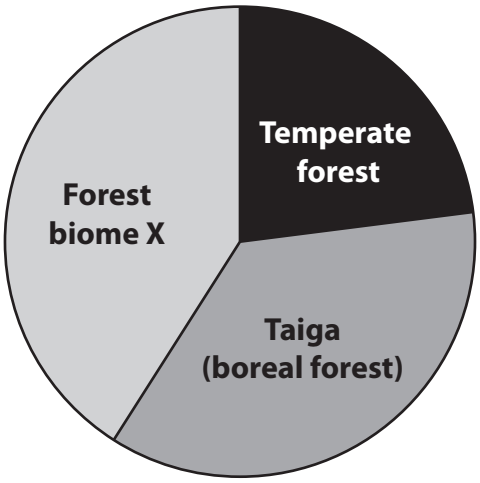
Biome name	Animal biodiversity (approximate number of species)
Tundra	900
Taiga (boreal forest)	1,200
Temperate forest	4,500
Temperate grassland	3,500
Desert	500

Figure 1

Russia's biome map and animal biodiversity

SECTION B

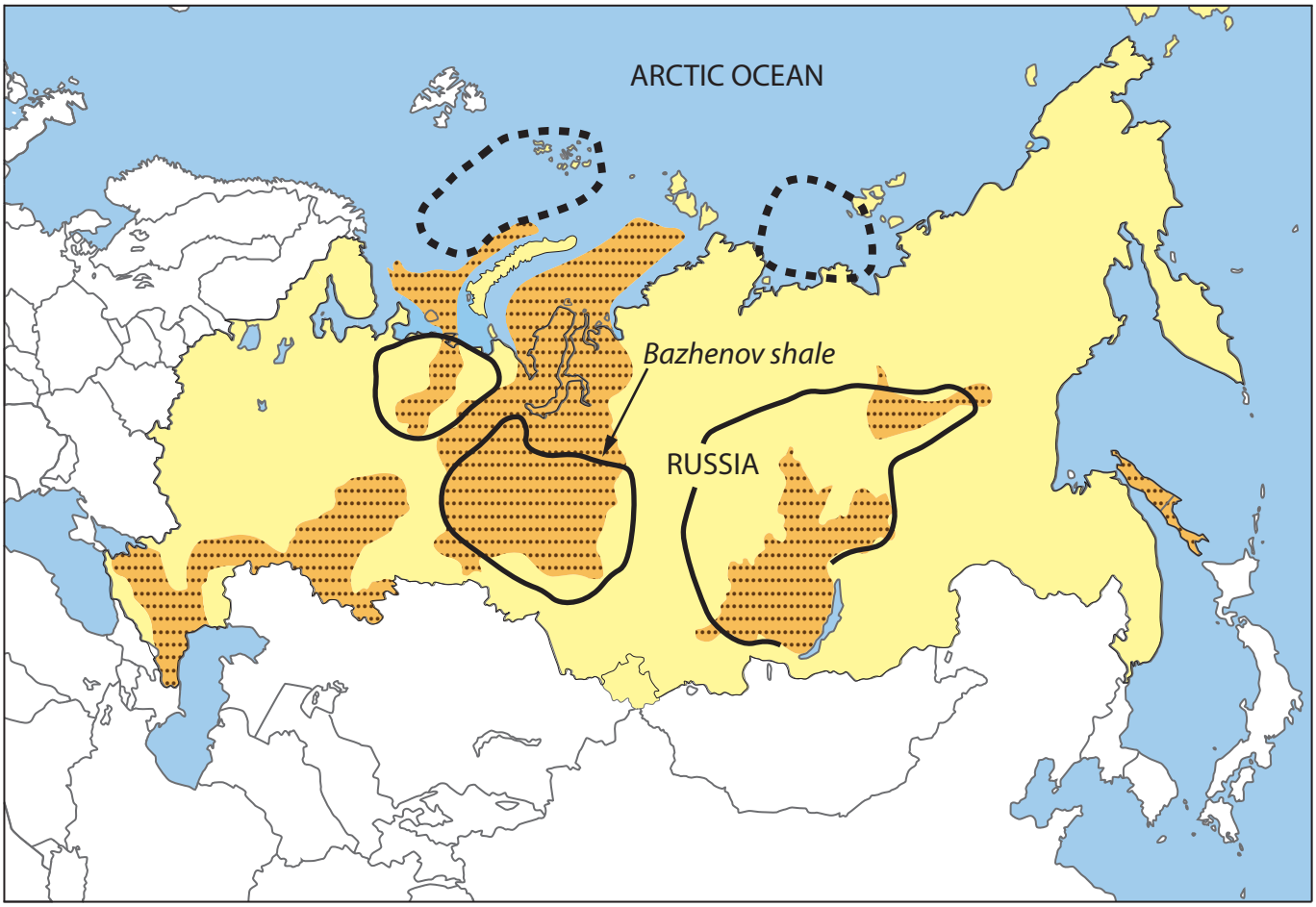
Forests Under Threat



- Globally, around 1,500 billion tonnes of carbon are stored in three biomes.
- The carbon stored worldwide in the taiga (boreal forest) is equivalent to all emissions from human activity in the last 100 years.
- Frozen soil and ground below the taiga (boreal forest) also store greenhouse gases.

Figure 2

Global carbon storage in different biomes



km
0 1000

Key:

Conventional oil and gas fields currently in production

New sources of fossil fuels that could be developed in the future

Shale gas

Arctic ocean oil fields

Figure 3

Conventional and unconventional oil and gas fields in Russia

SECTION C

Consuming Energy Resources

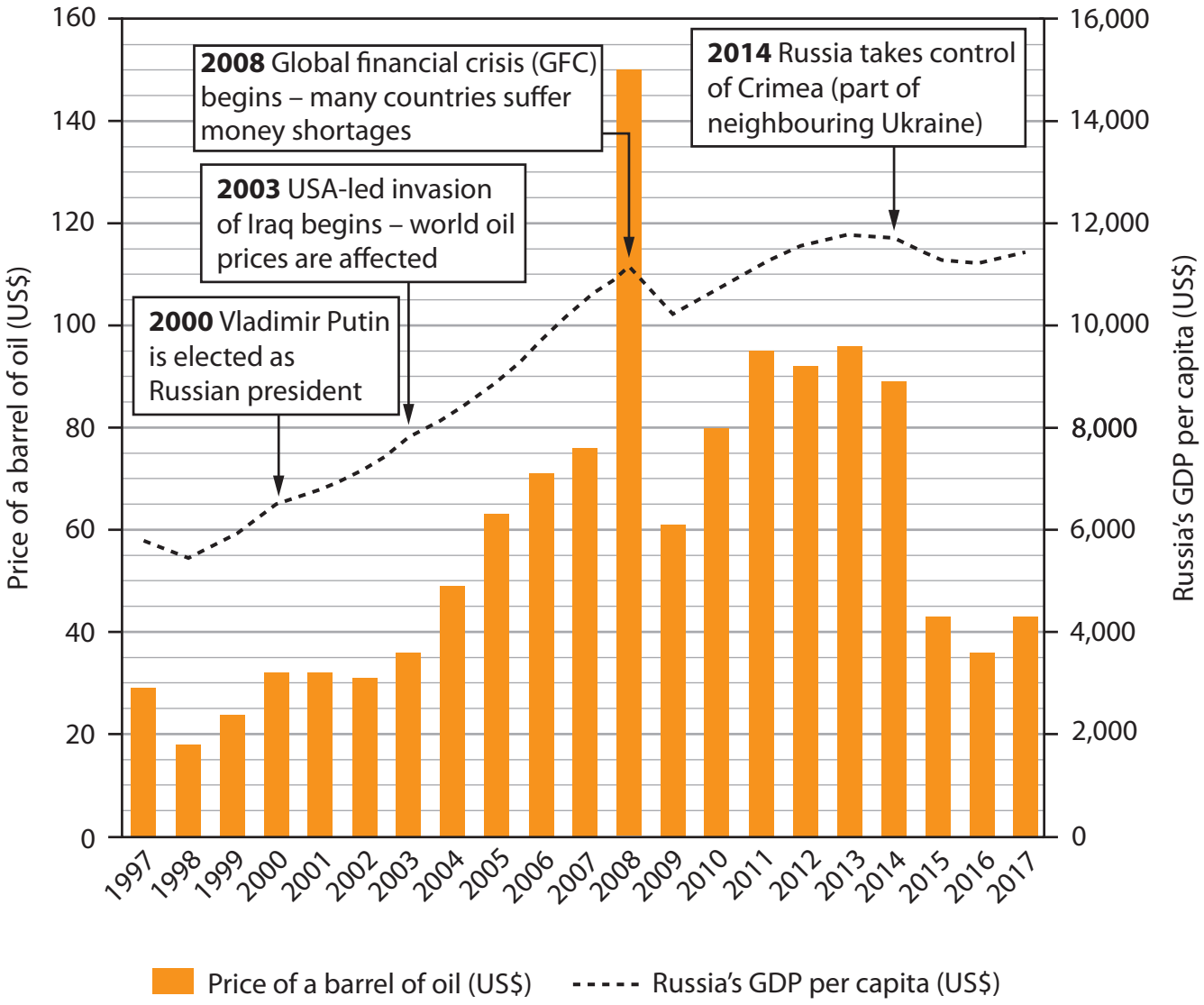


Figure 4

A timeline showing changes in oil prices and Russia's gross domestic product (GDP) per capita, 1997–2017

Country	% of gas supplied by Russia
Finland	100
Poland	60
Germany	37
Italy	29
Greece	56

Figure 5

Selected European countries which bought Russian gas, 2017

2014

Russia takes back Crimea

2016

Russia accused of using Facebook to get Trump elected as US president

2018

Russian spies may have carried out UK poison attack in Salisbury

Figure 6

Selected news headlines involving Russia, 2014–2018

Key:

500km

Russian gasfields

'Power of Siberia' pipeline

Gas storage plant

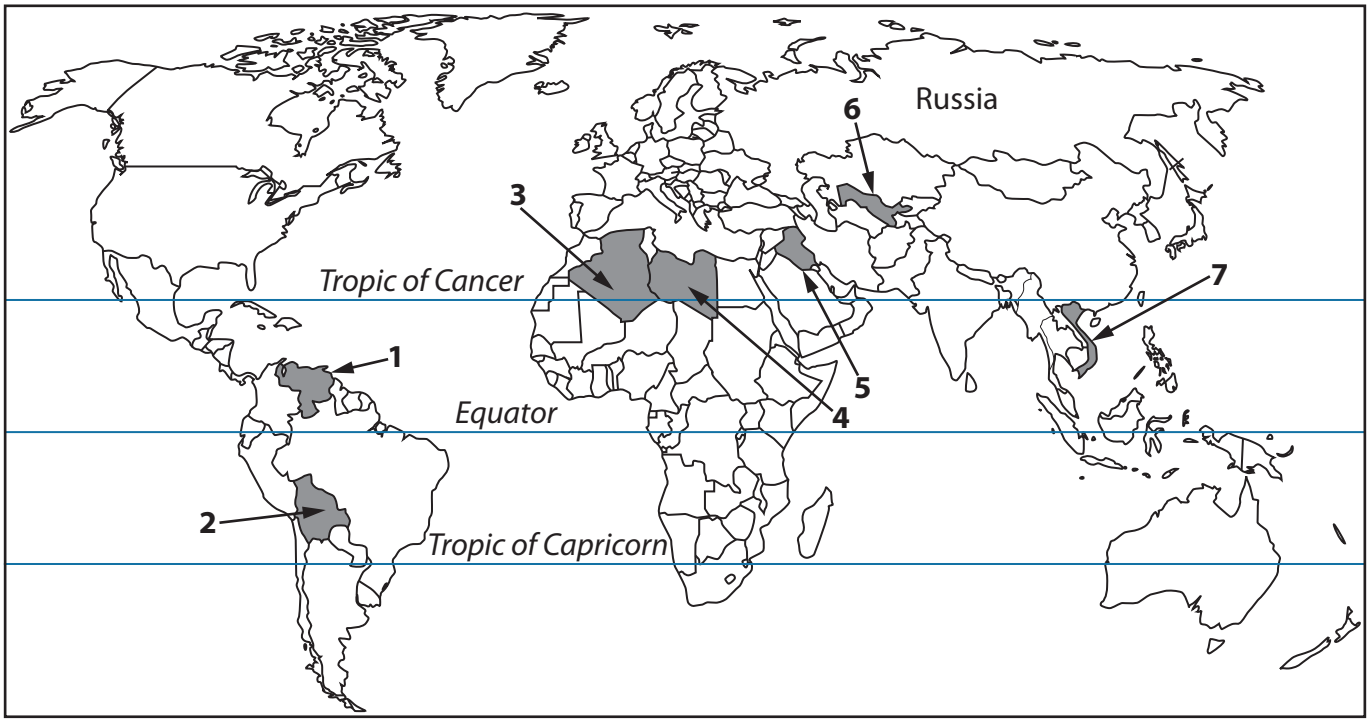
Other planned gas pipelines

International border

- Work started on the 'Power of Siberia' pipeline in 2018.
- It carries gas from Russian gas fields to China's border.
- The gas is sold to China in a deal worth US$400 billion over 30 years.
- The pipeline, paid for by Russian energy company Gazprom, is over 4,000 km long.

Figure 7

The new 'Power of Siberia' gas pipeline links Russia to China



	Countries	Natural environments
1	Venezuela	Tropical rainforest and tropical grassland
2	Bolivia	Tropical rainforest and tropical grassland
3	Algeria	Mostly desert
4	Libya	Mostly desert
5	Iraq	Mostly desert
6	Uzbekistan	Mostly desert
7	Vietnam	Tropical rainforest

Figure 8

Selected countries where Russian energy companies are developing new oil and gas resources

- **NEED FOR NEW OIL AND GAS SOURCES**
  Russia's own oil and gas companies need new sources if they want to maintain their production levels. Conventional sources will be running out by 2030.

- **GEOLOGICAL CHALLENGES**
  Russia has shale gas sources including the Bazhenov shale. However, complex geology presents technical problems for Russian energy companies.

- **OFFSHORE DIFFICULTIES**
  There are offshore oil reserves along Russia's northern coastline. However, conditions there are difficult.

- **POLITICAL ISSUES**
  Russia's energy companies want transnational corporations (TNCs) from other countries to help them develop new oil and gas reserves in Russia. However, TNCs with headquarters in the US, UK and EU countries are no longer allowed to work with Russian companies.

Name of TNC	**ExxonMobil**	**Shell**	**BP**
Headquarters	USA	Netherlands (EU)	UK
Cancelled or postponed Russian energy projects	• Russia's oil companies hoped Exxon would share its shale gas technology and experience. • Exxon has been exploiting US shale gas for many years. • In 2014, the US government told Exxon to stop working in Russia.	• In 2010, Shell agreed to work with Gazprom, a Russian oil company. • Together, they hoped to cooperate on a range of shale and offshore projects. • Because of the political situation, some of these plans were put on hold.	• BP planned to help Russian companies exploit new Arctic Ocean oil reserves. • BP specialises in exploring for oil in deep water with challenging weather conditions. • In 2018, BP said it would abandon some of its Russian plans.

Figure 9

Physical and political challenges for energy companies working in Russia, 2019

China has built 100,000 onshore wind turbines in sparsely populated areas such as the Gobi Desert.

There are around 2,000 offshore wind turbines in shallow waters along the UK's coastline.

Wind energy used by selected countries, 2017

Country	Land area (thousand km²)	Wind energy as a % of all energy used	Energy output of existing wind turbines (gigawatts)
Germany	357	12	56
UK	242	7	20
China	9,597	4	190
Russia	17,098	<1	2

- Wind energy use has helped some EU countries to reduce their carbon emissions in line with government targets.
- In theory, much of the world's energy needs could be met using wind power. Only a fraction of this potential is currently used.
- In Russia, up to 9,000 gigawatts of wind energy is potentially available. However, millions of new wind turbines would be needed.
- A wind turbine costs around £100,000. Also, new power networks are needed to transmit the electricity to where it is needed. However, costs will fall as the technology improves.

Figure 10

The use of wind energy

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Figure 3 adapted from: https://medium.com/@Oillywood/russia-turns-to-new-friends-from-china-and-the-middle-east-bf0002384565

Figure 5 adapted from: © Sergii Pal/123rf

Figure 7 adapted from: https://ig.ft.com/gazprom-pipeline-power-of-siberia/

Figure 10 images from: © Feng Wei Photography/Getty Images and © Simon Belcher/Alamy Stock Photo