



**A-level**

**ECONOMICS**

**Paper 3 Economic Principles and Issues**

**7136/3**

**Insert**

**Do NOT write any answers in this Insert. You MUST answer the questions in the Answer Booklet provided.**

**CLIMATE CHANGE – it is not too late**

**QUESTIONS 31 to 33**

- **EXTRACT A: Greenhouse gas emissions: a global problem**
- **EXTRACT B: The UK is reducing its greenhouse gas emissions but are they falling fast enough?**
- **EXTRACT C: Selected indicators of greenhouse gas emissions in the UK**
- **EXTRACT D: Solving the climate change crisis**
- **EXTRACT E: Reducing greenhouse gas emissions has benefits as well as costs**

**[Turn over]**

**EXTRACT A: Greenhouse gas emissions:  
a global problem**

**The Intergovernmental Panel on Climate Change (IPCC) reported that, unless something is done, greenhouse gas (GHG) emissions will cause global temperatures to rise by almost 3°C by the end of the century. The main GHG is carbon dioxide (CO<sub>2</sub>). The IPCC believes that, unless the increase in average temperature is kept below 1.5°C, there will be significant costs. Sea levels will rise and more people will be affected by flooding. Some parts of the world will be exposed to drought. To avoid such problems, we need to use cleaner energy, adopt sustainable lifestyles and protect our forests.**

**Source: News reports, January 2020**

**EXTRACT B: The UK is reducing its greenhouse gas emissions but are they falling fast enough?**

In 2018, UK greenhouse gas emissions were 44% below 1990 levels even though the economy grew by 75%. In June 2019, the UK government introduced a legally binding net-zero GHG emissions target. A net-zero target means that some emissions are allowed provided they are removed from the atmosphere by natural or engineered methods. Reducing net emissions to 100% below their 1990 level is possible but will not be achieved unless effective policies are introduced. There will be a substantial economic cost, but the expansion of the green economy will add to growth and create jobs. Less pollution will improve people's health, reducing pressure on the NHS and social services.

Between 1990 and 2017, emissions from the energy supply sector fell by 60%. The decrease in emissions resulted from changes in the types of fuel used to produce electricity and improvements in technology.

**Source: News reports, January 2020**

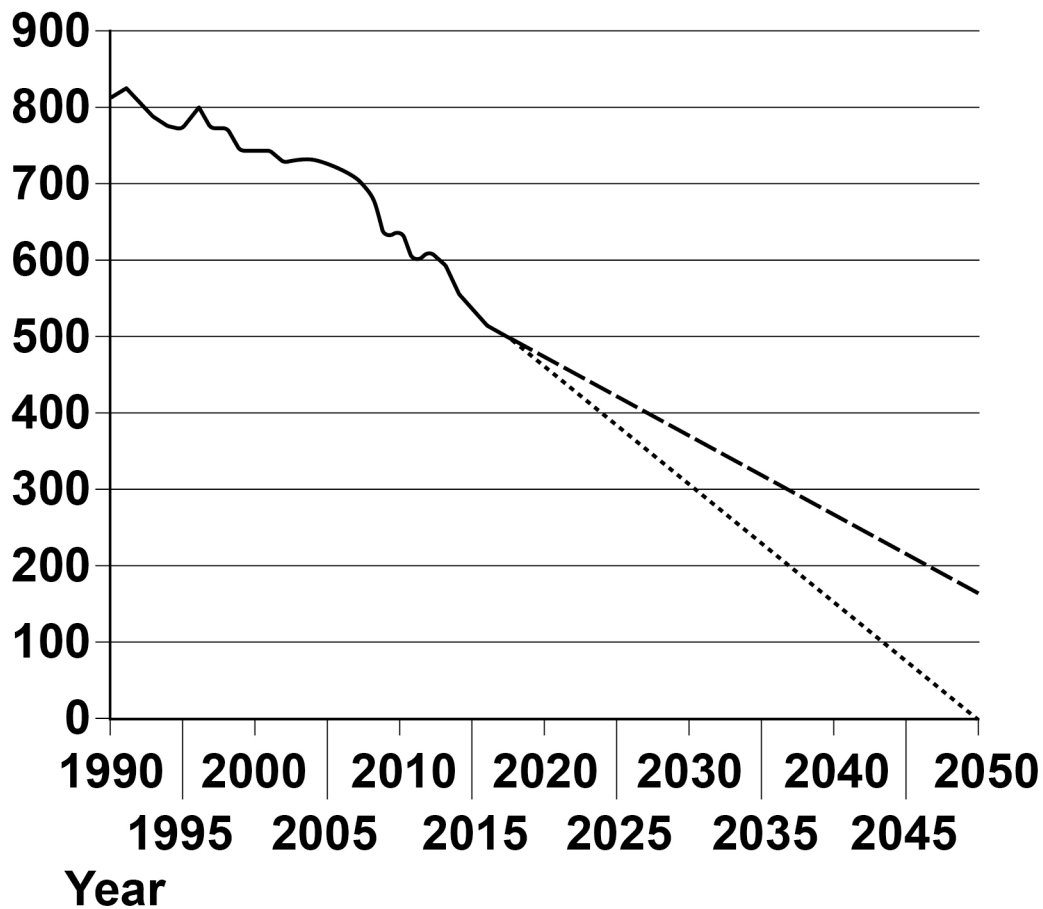
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**EXTRACT C: Selected indicators of greenhouse gas emissions in the UK**

**FIGURE 1: The reduction in carbon emissions needed to achieve the 80% and 100% carbon-reduction targets by 2050**

**The Climate Change Act of 2008 set a target for the UK to reduce GHG emissions to 80% of their 1990 level by 2050. In June 2019, this was changed to a net-zero emissions target. The diagram, on the opposite page, illustrates how the new target affects how quickly GHG emissions have to be reduced.**

## GHG emissions (MtCO<sub>2</sub>e)



### KEY

- Actual emissions
- Reduction in emissions needed to achieve the 80% target
- ..... Reduction in emissions needed to achieve the net-zero target

**Note: MtCO<sub>2</sub>e is a standardised measure of the emissions from different greenhouse gases based upon their global warming potential.**

**Source: BEIS (2019)**

**[Turn over]**

**FIGURE 2: Sources of greenhouse gas emissions, UK, 1990–2017, MtCO<sub>2</sub>e**

	1990	2000	2010	2017
<b>Transport</b>	<b>128.1</b>	<b>133.3</b>	<b>124.5</b>	<b>125.9</b>
<b>Energy supply</b>	<b>277.9</b>	<b>221.6</b>	<b>207.4</b>	<b>112.6</b>
<b>Business</b>	<b>114.0</b>	<b>115.4</b>	<b>94.1</b>	<b>80.1</b>
<b>Residential</b>	<b>80.1</b>	<b>88.7</b>	<b>87.5</b>	<b>66.9</b>
<b>Agriculture</b>	<b>54.0</b>	<b>50.3</b>	<b>44.6</b>	<b>45.6</b>
<b>Waste management</b>	<b>66.6</b>	<b>62.9</b>	<b>29.7</b>	<b>20.3</b>
<b>Industrial processes</b>	<b>59.9</b>	<b>27.1</b>	<b>12.6</b>	<b>10.8</b>
<b>Public sector</b>	<b>13.5</b>	<b>12.1</b>	<b>9.5</b>	<b>7.8</b>
<b>LULUCF</b>	<b>0.3</b>	<b>-3.9</b>	<b>-9.1</b>	<b>-9.9</b>
<b>Total</b>	<b>794.4</b>	<b>707.5</b>	<b>600.9</b>	<b>460.2</b>

**Source: ONS 2020, accessed January 2020**

**Note: LULUCF is land use, land use change and forestry.**

**The negative values show that the LULUCF sector absorbed GHG emissions in 2000, 2010 and 2017. The figures may not sum to the totals due to rounding.**

**FIGURE 3: Sources of fuel used to produce electricity in the UK, 1990–2017, GWh**

	1990	2000	2010	2017
<b>Coal</b>	<b>119 950</b>	<b>107 594</b>	<b>75 878</b>	<b>22 530</b>
<b>Oil</b>	<b>6 524</b>	<b>4 805</b>	<b>2 037</b>	<b>1 615</b>
<b>Gas</b>	<b>148 077</b>	<b>175 653</b>	<b>99 875</b>	<b>136 746</b>
<b>Nuclear</b>	<b>85 063</b>	<b>62 140</b>	<b>70 345</b>	<b>70 336</b>
<b>Renewables</b>	<b>10 360</b>	<b>26 181</b>	<b>83 365</b>	<b>98 792</b>
<b>Other</b>	<b>4 401</b>	<b>2 545</b>	<b>4 636</b>	<b>5 281</b>
<b>Total</b>	<b>374 375</b>	<b>378 918</b>	<b>336 136</b>	<b>335 300</b>

**Source: ONS, accessed January 2020**

**Note: GWh is a unit of electricity used to measure the output of large power stations.**

**The main GHG emissions when producing electricity come from fossil fuels such as coal, oil and gas.**

**[Turn over]**

**EXTRACT D: Solving the climate change crisis**

**In the long run, climate change will affect us all. So why don't firms and consumers act now to limit GHG emissions? One reason is that prices don't reflect the real costs and benefits. For example, when fuels which emit greenhouse gases are too cheap, they are overconsumed.** 1 5

**The earth's atmosphere is a common resource and so it is difficult to assign and enforce property rights. Economic incentives do not work effectively and markets fail to deal with global warming.** 10

**People are biased towards preserving their present benefits and undervalue future costs and benefits. Some producers in the fossil fuel industry are rich and powerful and are able to influence governments. The young, who will be most affected by climate change, are less powerful.** 15

**Carbon taxes could be used to discourage GHG emissions but it is difficult to decide how high the tax should be. Pollution permits could be introduced, but how much pollution should be allowed? Regulations that restrict GHG emissions increase firms' costs and have to be monitored. Subsidies to encourage the development of technologies that reduce carbon-emissions increase government spending. The European Commission plans to introduce a carbon border tax to protect** 20 25



**energy-intensive industries against cheaper imports from countries with less strict climate policies, but this could breach World Trade Organisation (WTO) rules and invite retaliation.**

**30**

**Source: News reports, January 2020**

**[Turn over]**

## **EXTRACT E: Reducing greenhouse gas emissions has benefits as well as costs**

- Some policies that reduce GHG emissions increase costs and make it difficult for firms to compete internationally. Energy-intensive industries, such as steel, chemical, cement and paper manufacture, would be particularly hard hit. Production could move elsewhere and these products would be imported from countries that are less concerned about GHG emissions. If UK policy is too restrictive, jobs will be lost and communities reliant on industries producing carbon-based products will suffer. If firms move abroad and investment in the UK economy falls, economic growth and living standards will be affected. Climate change is a global problem that cannot be solved by one country acting alone.** 1 5 10 15
- Nevertheless, failure to devote sufficient resources to tackling climate change now, may lead to higher costs in the future. Warmer temperatures, extreme weather, higher sea levels and flooding will damage property and vital infrastructure. More money will have to be spent on flood defences. Climate change will affect human health and reduce productivity. Some sectors of the economy will suffer, including agriculture and fishing.** 20
- Climate change provides opportunities for business to invest in clean, non-polluting sources of energy and energy-efficient buildings. Firms that win the race to supply electric vehicles and the** 25

**vehicle-charging infrastructure will make substantial profits. Biotech companies will profit from developing crops resistant to the impact of climate change. The UK's success in producing wind-powered electricity from turbines provides export opportunities for UK businesses. The UK needs to compete in the growing markets for zero-carbon goods and services.** 30 35

**The move towards a zero-carbon economy will involve a change in the pattern of production but the economy cannot adjust instantaneously. The short-term costs to the macroeconomy could be substantial.** 40

**Source: News reports, January 2020**

**END OF EXTRACTS**

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