1.27 Tradable Pollution Permits, Regulation and Government Failure

Total Marks

AQA 7136 · Calculators not allowed · about 75 minutes · Write-in edition

Name: _____ Date: ____ / ____ / _____

Answer all questions. Write full sentences for the levels-marked questions only. No calculator is required. Time guidance: approximately 75 minutes.

1 Data extract: The Midlands cap-and-trade pilot reported in Year 1 that the regional cap was 1 000 000 tonnes CO2 and the average permit price was £18. In Year 2 the cap was reduced to 900 000 tonnes and the average permit price rose to £28. Emissions reported by monitored firms fell from 980 000 tonnes to 870 000 tonnes. Explain how the data show that tightening the cap changed firms' incentives to abate in this regional UK pilot.

(Total for Question 1 is 9 marks)

2 Evaluate whether government intervention inevitably leads to a better outcome than leaving environmental externalities to the market, discussing different instruments and the limits imposed by government failure.

(Total for Question 2 is 25 marks)

3 Define a tradable pollution permit in the context of a cap-and-trade environmental policy for UK industry.

(Total for Question 3 is 2 marks)

4 Explain how a cap-and-trade scheme for air pollution, operating in the UK, provides firms with a financial incentive to reduce emissions. Draw a simple diagram showing firm marginal abatement cost and the permit price, and indicate the effect of a permit price above the firm's marginal abatement cost.



(Total for Question 4 is 4 marks)

5 Define regulation in the context of environmental policy, naming a typical command-and-control measure used in UK pollution control.

(Total for Question 5 is 2 marks)

6 Define regulatory capture in the context of environmental regulation in the UK or similar economies.

(Total for Question 6 is 2 marks)

7 Explain, with an example, how an unintended consequence of a pollution regulation might reduce the policy's effectiveness in a UK context.

(Total for Question 7 is 3 marks)

Mark scheme · 1.27 Tradable Pollution Permits, Regulation and Government Failure

Question 1

Level 1 Simple statements that restate parts of the data with limited linkage to incentives **1-3**

Level 2 Developed explanation linking cap reduction and higher permit price to stronger abatement incentives, using the data to support the argument **4-6**

Level 3 Sophisticated response that explains causation, refers to permit price mechanism, trading behaviour and provides evaluation or alternative explanations supported by the data **7-9**

Indicative content:

- Year 1 cap 1 000 000 to Year 2 cap 900 000 shows the regulator tightened the supply of permits, an expected cause of a permit price rise
- Permit price rose from £18 to £28, increasing the marginal cost of emitting and therefore the financial incentive for firms to abate rather than buy permits
- Reported emissions fell from 980 000 to 870 000 tonnes, a fall larger than the nominal cap reduction, indicating firms undertook additional abatement rather than simply trading permits
- Firms with low abatement cost would sell permits, high cost firms would abate up to where their marginal abatement cost equals £28, supporting cost effective abatement across the region
- Alternative explanations: broader economic slowdown could lower emissions, or improved monitoring could reveal previous underreporting; evaluation should weigh these against the matching timing of cap tightening and price rise

Question 2

Level 1 Basic explanation of one or two arguments for intervention or against it, little or no use of economic analysis, limited or no diagram, no clear judgement **1-5**

Level 2 Clear explanation of arguments for intervention and some government failure issues, some economic analysis and at least one diagram or example, partial judgement **6-10**

Level 3 Balanced and sustained evaluation, includes analysis of multiple instruments, diagrams, discussion of the magnitude and likelihood of government failure problems, and a reasoned, supported judgement **11-15**

Level 4 Comprehensive analysis and evaluation with detailed examples, well drawn diagrams applied to the argument, precise discussion of trade offs, distributional effects and institutional constraints, leading to a strong judgement **16-20**

Level 5 Outstanding, well-structured response that integrates theory and evidence across instruments, critically examines government failure mechanisms with depth, addresses counterarguments and uncertainty, and reaches a nuanced, justified conclusion **21-25**

Indicative content:

- For intervention: market failure from negative externalities means private firms emit more than socially optimal; diagrams: negative production externality with marginal private cost and marginal social cost, and how a Pigovian instrument or cap shifts outcome closer to social optimum
- Tradable permits: can achieve cost effective abatement, provide clear price signal, allow flexibility; diagram: permit price line and MAC equalisation across firms; evidence of success in some emissions trading systems
- Regulation and direct provision: can deliver targeted reductions and ensure minimum standards where markets fail badly or when information is weak, direct provision of public goods or monitoring can be justified
- Information provision and labelling: can change consumer behaviour at low administrative cost, useful where consumers misjudge environmental impacts
- Government failure arguments: regulatory capture can bias rules towards industry, high administrative and monitoring costs can make intervention inefficient, imperfect information can lead to wrong cap setting or wrong standards, unintended consequences like carbon leakage, and time lags reduce effectiveness
- Evaluation of instruments: permits perform well where monitoring is feasible and markets are liquid, but may fail if market power or low liquidity drive price volatility; command-and-control avoids market failures from thin markets but can be costlier and less flexible
- Magnitude and probability: weigh how severe the externality is, institutional capacity, and the political economy; small administrative costs may be acceptable for large environmental gains, but capture and poor design can wipe out benefits
- Distributional effects and winners and losers: firms, consumers and future generations; consider transitional support and compensation to improve political feasibility
- Conclusion: intervention is often necessary to correct environmental externalities, but it does not always improve outcomes; careful instrument choice, good information, transparency and safeguards against capture are required to ensure net improvement

Question 3

a permit is a government issued allowance giving the holder the legal right to emit a specified quantity of pollutant, usually measured in tonnes **B1**

permits are tradable, meaning firms can buy and sell allowances so the total emissions stay within the cap **B1**

Answer: A government issued allowance to emit a specified quantity of pollutant, tradable between firms so total emissions respect the cap.

Question 4

states that a permit price creates an opportunity cost of emitting, so firms face a cost per extra tonne emitted — **M1**

diagram: correctly labelled axes, upward sloping MAC curve, horizontal permit price line and old and new emission points — **M1**

explains that if permit price is higher than the firm's marginal abatement cost for an extra tonne, the firm will abate that tonne instead of buying a permit — **A1**

explains trading outcome: firms with low abatement cost sell permits, firms with high abatement cost buy permits, achieving cost-effective overall abatement — **A1**

Answer: A permit price makes emitting costly. Firms abate up to the point where MAC equals the permit price; if MAC is below the permit price they reduce emissions rather than buy permits, and trading lets abatement occur where it is cheapest across firms.

Question 5

regulation is government-imposed rules or standards that firms must follow to limit harmful behaviour or protect public goods — **B1**

example given, e.g. emission limit values, technology standards, or mandatory filters on smokestacks — **B1**

Answer: Regulation is government rules setting required standards or limits; example: mandatory emission limit values or required use of specified abatement technology.

Question 6

regulatory capture occurs when the regulator acts in the interest of the industry it regulates rather than the public interest — **B1**

often arises through close relationships, revolving doors, or lobbying that influence rule making and enforcement — **B1**

Answer: When a regulator favors the regulated industry over the public, often due to close industry influence, lobbying or personnel links, undermining regulatory objectives.

Question 7

identifies an unintended consequence, e.g. firms relocating production overseas leading to carbon leakage — **M1**

explains mechanism: relocation reduces domestic emissions but global emissions may rise if production shifts to less efficient jurisdictions — **A1**

gives an example or development, e.g. UK manufacturing moving abroad to avoid strict limits, undermining environmental goals — **B1**

Answer: An example is carbon leakage where firms relocate production to countries with weaker rules; domestic emissions fall but global emissions may rise, reducing net environmental benefit.