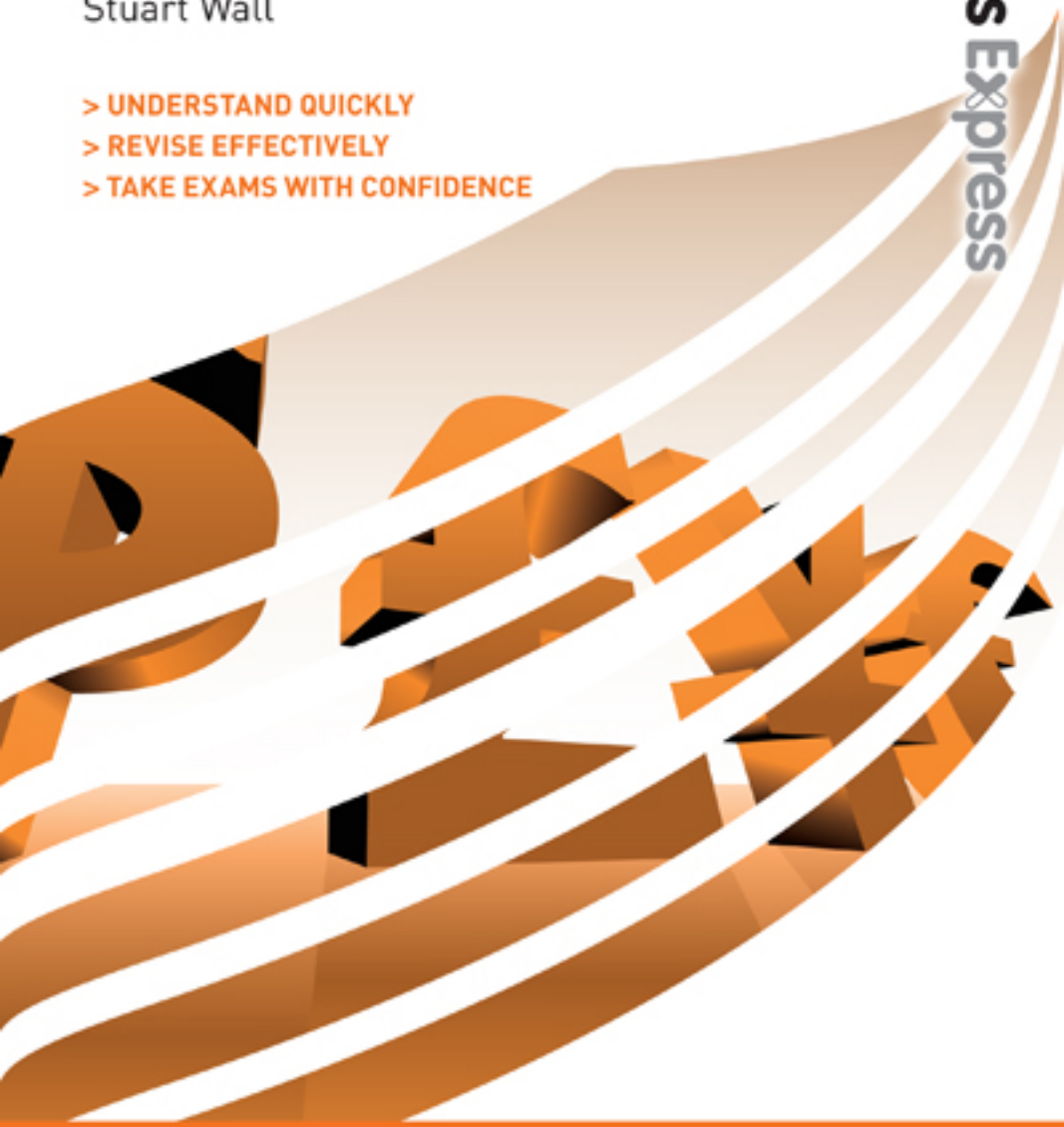
Environmental Economics

Stuart Wall

> UNDERSTAND QUICKLY
> REVISE EFFECTIVELY
> TAKE EXAMS WITH CONFIDENCE

Economics Express



ALWAYS LEARNING

PEARSON

Environmental Economics

Economics Express

setting an inappropriate standard and/or an inappropriate penalty will lead to a misallocation of resources.

Taxes versus standards

In practice, policy makers may be faced with an alternative of setting a *single tax* or a *single standard* to be imposed on all firms. It is unlikely that a standards regime would be sufficiently well informed, or flexible enough, to impose a *variable standard* on each and every firm.

Taking it further

Standard setting with multiple firms

In practice, policy makers may be faced with an alternative of setting a single tax or a single standard to be imposed on all firms. It is unlikely that a standards regime would be sufficiently well informed, or flexible enough, to impose a variable standard on each and every firm. Figure 3.10 indicates how an inflexible standards regime of this kind might achieve the same result as a tax regime, but at greater cost to the participating firms.

In Figure 3.10, left to its own devices each firm will itself produce 14 units of pollutant, 28 in total. Suppose the government seeks 14 units of pollutants in total. This could be achieved either by the tax O*T* imposed on each firm or by restricting each firm to emitting 7 units of pollutant (we assume there to be inadequate information to apportion different levels of pollution emission to each firm).

- We can see that the tax regime would achieve the overall 14 units emission total by firm A producing 6 units and firm B producing 8 units, with each firm equating its respective marginal abatement costs to the tax rate, O*T*.
- However, if, under a standards regime each firm were instructed to produce no more than 7 units of emission, then the shaded portions of Figure 3.10 indicate that firm B would incur increased abatement costs by having to reduce emissions from 8 to 7, whereas firm A would incur reduced abatement costs by no longer having to reduce emissions to 6 but only to 7. In our diagram, the increased abatement costs to B are greater than the reduced abatement costs to A. In other words, compared with the tax regime, our standards regime, in which a fixed standard is apportioned to each firm, is more costly in achieving a given result. The flatter the respective *MAC* curves, the smaller this cost differential will be.

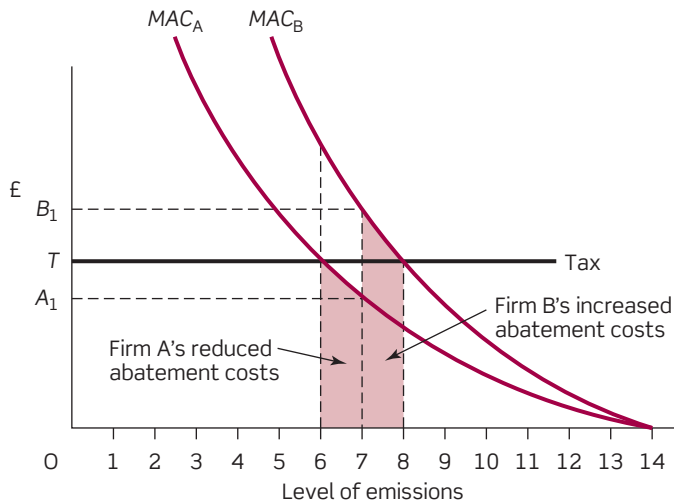


Figure 3.10 Extra cost of achieving a given level of emissions (14 units).via common standards on each firm as compared with a tax.

Environmental regulations

In the EU, a legally binding regulation on maximum emissions of greenhouse gases by new vehicles comes into force in 2015, namely a maximum emission of 130g of CO_2 per kilometre travelled by new cars from that date.

In the UK, the Environmental Protection Act (1989) laid down minimum environmental standards for emissions from over 3,500 factories involved in chemical processes, waste incineration and oil refining. The factories have to meet these standards for all emissions, whether into air or water or onto land. Factory performance is monitored by a strengthened HM Inspectorate of Pollution, the costs of which are paid for by the factory owners themselves. The Act also provided for public access to information on the pollution created by firms.

Regulations have also been established in the UK on restricting the release of genetically engineered bacteria and viruses, and a ban was imposed on most forms of straw and stubble burning from 1992 onwards. Stricter regulations were also imposed on waste disposal operations, with local authorities given a duty to keep public land clean. On-the-spot fines of up to £1,000 were instituted for persons dropping litter.

Regulations have also played an important part in the five 'Environmental Action Programmes' of the EU, which first began in 1973. For example, specific standards have been set for minimum acceptable levels of water quality for drinking and for bathing. As regards the latter, regular monitoring of coastal waters must take place, with as many as 19 separate tests undertaken throughout the tourist season.

Of course, regulations may be part of an integrated environmental policy which also involves market-based incentives. A tradable permits system for sulphur dioxide emissions has been long established in the USA and works in tandem with the standards imposed by the US Clean Air Act.

We return in more detail to the issue of setting targets and using various policy instruments to achieve them in most of the following chapters. For example, Chapter 6 will look in more detail at how targets have been set for CO_2 and greenhouse gas emissions, and how various policy instruments are being used in attempts to achieve those targets.

Assessment advice

The use of environmental targets and policy instruments is discussed further in Chapter 5 in the context of climate change. The theory and practice reviewed there will strengthen your answers on setting and achieving targets. Chapters 6–8 will also apply targets and policy instruments to practical policy areas, such as energy, transport and natural resources.

Chapter summary – pulling it all together

By the end of this chapter you should be able to:

	Confident ✓	Not confident?
Examine the basis on which environmental targets have been set, especially the economic rationale		Revise pages 65–68
Evaluate the theory and practice of the market-based policy instruments used to achieve those targets. These policy instruments include taxes, subsidies and other market-based instruments		Revise pages 68–73
Evaluate the theory and practice of tradable permits and negotiation as policy instruments to achieve those targets		Revise pages 73–79
Evaluate the theory and practice of non-market-based policy instruments used to achieve those targets. These include regulations, standards and other non-market-based instruments		Revise pages 79–83

Now try the assessment question at the start of this chapter using the answer guidelines below.

Answer guidelines

✱ Assessment question

Evaluate the contribution of emissions trading schemes to the reduction of CO_2 and greenhouse gas emissions.

Approaching the question

It will be useful to establish that tradable permits is one of a number of market-based schemes to reduce pollution. You could, however, mention that it also has an element of 'non-market' regulation, as governments or international bodies (e.g. the EU) set the limit on the number of permits made available. Diagrams will be a key part of explaining how tradable permit schemes work, as will empirical evidence, such as the cement industry Examples & evidence **(p. 76)**, EU Emissions Trading Scheme **(p. 74)**, etc.

Important points to include

- Operation of a tradable permit scheme, using diagrams to illustrate, e.g. Fig. 3.5 **(p. 74)**.
- Definition and use of marginal abatement costs (MACs) to demonstrate the rationale behind such schemes, e.g. Fig. 3.6 **(p. 75)**.

The advantages and disadvantages of tradable permits can be reviewed vis-à-vis alternative schemes for dealing with pollution.

Advantages

- Tradable permits provide a new form of property right which has a market value rather than environmental taxes which charge polluters. They are likely to be a more acceptable policy instrument.
- The price mechanism will help allocate the restricted supply of permits to those who most value them. In terms of Figure 3.5 **(p. 74)** new entrants into the industry would *shift* (increase) the demand curve for permits from D_1 to D_2. If there is no change in the supply of permits (Q_S) then the price of permits will increase from P_1 to P_2 and some existing holders of permits will be willing to sell them at this higher price.
- The supply of permits can be adjusted to meet changed conditions.
- Tradable permits can be viewed as cost effective, providing there are incentives for polluters with low abatement costs to abate (avoid) pollution and sell the permits no longer required to polluters with higher abatement costs.

- Tradable permits reduce the uncertainty as the agency can issue permits in line with current guidelines as to the maximum level of emissions which the environment can safely absorb. With environmental taxes, however, the tax set may be too low to achieve the socially optimum level of emissions.
- Inflation will reduce the real value of environmental taxes, so that they may have to be increased on a regular basis in order to achieve the required level of pollution.

Disadvantages

- Problems with allocating permits. 'Grandfathering' penalises firms that have been successful in reducing their emission levels as they are now allocated fewer permits than those firms that have not reduced their emission levels.
- Permits give the owner the right to pollute – arguably unethical.
- The permit system could thus act as a 'barrier to entry' and be seen as anti-competitive. A few polluters may purchase (or be given) all the available permits (cornering the market in permits), thus making it difficult for new firms, who also pollute, to enter the industry.
- The administrative costs of monitoring and enforcing a permit system could be excessive if there are a large number of polluters.

Make your answer stand out

As already indicated above, the effective use of diagrams and examples/case studies will gain you the highest marks.

Read to impress

Here are some books, articles and other sources that you can use to develop your answers on the topic area.

Books

Cato, M. S. (2011) Part II, *Environment and Economy*, Chapters 8, 11. London: Routledge.

Griffiths, A. and Wall, S. (2011) *Applied Economics*, 12th edition. Harlow: FT/Prentice Hall.

Perman, R. et *al.* (2011) *Natural Resource and Environmental Economics,* Chapters 4, 5 and 6. Harlow: Addison Wesley.

Smith, S. (2011) *Environmental Economics: A very short introduction,* Chapters 2 and 3. Oxford: Oxford University Press.

Journals and periodicals

The following are useful sources of articles and data on many aspects relevant to this and other topics.

Economic Review, Philip Allan (quarterly)

Harvard Business Review (monthly)

Human Development Report (annual), United Nations

Journal of Environmental Economics and Management (bi-annual), Elsevier

National Institute Economic Review (quarterly), Stationery Office

Social Trends (annual), ONS

The Economist (weekly)

World Development Report (annual), World Bank

World Investment Report (annual), UNCTAD

Newspapers

Newspapers are important sources of up-to-date information, examples and data. Below are some of the main UK newspaper sources, many of which have websites with search facilities to identify specific topics and articles.

The Guardian

The Times

The Financial Times

The Independent

The Telegraph

References

Chaffin, J. (2012) Emissions trading, *Financial Times*, 14 February, p. 9.

Hosking, P. (2010) Green energy offers hope for those playing the long game, *The Times*, 18 June, pp. 32–33.

Companion website

Go to the companion website at **www.pearsoned.co.uk/econexpress** to find revision support online for this topic area.