Policies for the environment

The topic of the environment has been highly contentious in recent years. Demonstrators in many countries have been vocal in highlighting a wide range of issues that threaten the planet, supported by scientific evidence and high-profile documentaries. But how can these issues be tackled? **Peter Smith** looks at some economic measures that may help

A negative production externality

- Figure 1 is a reminder of the effect of a negative production externality caused by pollution resulting from a production process, which was discussed in the centrespread in the November 2022 issue of Economic Review.
- The welfare loss shown as the shaded area arises because firms take decisions on the basis of the private costs that they face, so do not take the external costs into account.
- The challenge for policy is how to persuade (or direct) firms to produce at the socially desirable point (Q^*).
- Two key ways of tackling this are either to impose taxes or to introduce direct regulation so that firms produce the desirable amount of output.

A tax on pollution

- The best situation for society when there is the negative production externality shown in Figure 2 is where $MSB = MSC$, which is at Q^*.
- Firms would choose to be at Q_1 if they only take into account marginal private cost (MPC).
- At Q^*, the difference between MSC and MPC is the vertical distance MSC minus x, so a tax of this amount would force firms to face the full costs of their production activity.
- Notice that this does not reduce pollution to zero; the aim is to balance marginal social benefits and costs by allowing only an acceptable amount of pollution.

How effective is taxation in tackling pollution?

- When the authorities choose to tackle pollution by taxes, a key question is how to measure the extent of the difference between MSC and MPC.
- In order to impose the appropriate rate of tax, it is crucial to know the extent of pollution at the optimum social output Q^*.
- Imposing too high a tax would result in too low a level of output, whereas too low a tax would not reduce pollution sufficiently.
- Using a tax may also cause inequality of treatment between firms, if some firms are more culpable of causing pollution than others.
- Administering and monitoring the tax is costly for the authorities.

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Regulating pollution

- Rather than using a tax (which effectively means controlling through the price mechanism), an alternative approach is to control by quantity.
- This entails setting limits to the amount of pollution that firms are permitted to emit.
- In terms of Figure 3, this implies requiring firms to produce at output Q^* rather than at Q_1.
- This would push the market price to P^*.

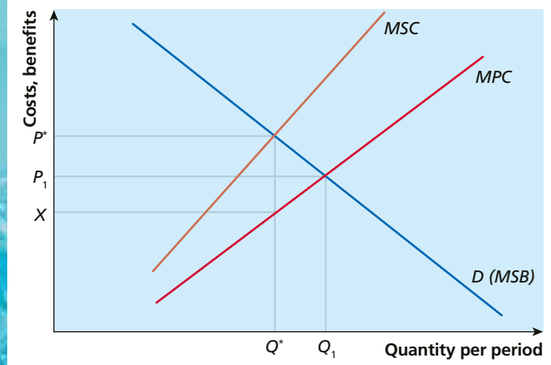

Figure 2 Using a tax to tackle a negative production externality

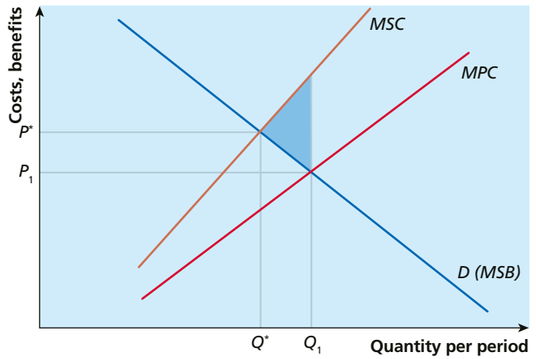

Figure 1 A negative production externality

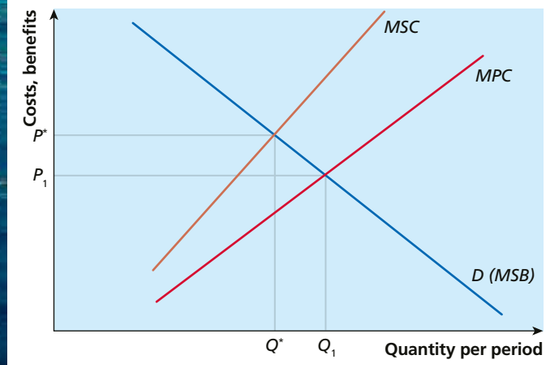

Figure 3 Using regulation to tackle a negative production externality

How effective is regulation in tackling pollution?

- As in the case of taxation, a key question is how to measure the extent of the difference between MSC and MPC.
- In order to regulate pollution effectively, it is crucial to be able to identify the optimum level of social output Q^*.
- Imposing too low a level of output would mean that too little output was being produced, whereas allowing too high a level of output would not reduce pollution sufficiently.
- The problem is further complicated because different firms are likely to be operating with differing efficiency and with differing emission levels of pollution, so a single allowable level of pollution will have differential impact on firms.
- The costs of administering and monitoring adherence to the regulations would be high.

Tradable pollution permits

- An alternative approach is for the authorities to issue (or sell) permits to firms that allow them to pollute up to a certain level.
- These permits can then be traded, so that firms using relatively clean technology can sell the permits that they do not need to firms that do.
- This ensures that only the allowable amount of pollution takes place.
- An advantage of this system is that it provides good incentives for firms to tackle pollution, by making them face the costs of pollution that they are causing.
- The system is administratively straightforward. Once the authorities have determined the overall target level of allowable pollution, the market does the rest.
- However, the authorities do need to be able to identify the appropriate level of pollution to allow in order to issue the right number of permits.
- The problem of monitoring behaviour remains, and there may need to be sanctions in place where firms try to evade the system.

The EU Emissions Trading System (EU ETS)

- The EU ETS is an example of a 'cap and trade' system designed to reduce carbon emissions.
- It has been in operation since 2005 and covers all EU countries plus Liechtenstein, Iceland and Norway.
- It controls emissions of greenhouse gases from power plants, industry factories and the aviation sector.
- After Brexit, the UK ceased to be an EU country, although it had been a strong advocate of the system.
- From 1 January 2021 the UK Emissions Trading System (UK ETS) replaced the UK's participation in the EU ETS to provide continuity of emissions trading for UK businesses.
- The aim of the UK ETS is to 'increase the climate ambition of the UK's carbon pricing policy, while protecting the competitiveness of UK businesses'.