

16 EXTERNALITIES

16.1 What are Externalities?

- ▶ Externalities are **third party effects** arising from production and consumption of goods and services for which no appropriate compensation is paid.
- ▶ Externalities occur in nearly every market and industry and can cause **market failure** if the price mechanism does not take into account the full social costs and benefits of production and consumption.
- ▶ Externalities **occur outside of the market** i.e. they affect economic agents *not directly involved* in the production and/or consumption of a particular good or service

16.2 The Importance of Property Rights

External costs and benefits are around us every day – the key point is that the market may fail to take them into account when pricing goods and services. Often this is because of the absence of clearly defined **property rights** – for example, who owns the air we breathe, or the natural resources available for extraction from seas and oceans around the world?

Property rights confer legal control or ownership of a good. For markets to operate efficiently, property rights must be clearly defined and protected – perhaps through government legislation and regulation.

If an asset is un-owned no one has an economic incentive to protect it from abuse. This can lead to what is known as the **Tragedy of the Commons** i.e. the over use of common land, fish stocks etc which leads to long term permanent damage to the stock of natural resources.

16.3 Negative Externalities

Negative externalities occur when production and/or consumption impose **external costs** on third parties outside of the market for which no appropriate compensation is paid. Some examples are given below together with links to relevant further reading via the Internet.

- ▶ Smokers ignore the unintended but harmful impact of 'passive smoking' on non-smokers – see this article published in July 2003 [“Workers warned of passive smoking”](#)
- ▶ Acid rain from power stations in the UK can damage the forests of Norway – see [effects of acid rain on the natural environment](#)
- ▶ Air pollution from road use – see [“London fails to meet pollution targets”](#)
- ▶ The social impact of drug abuse – see the [Drugscope web site](#)
- ▶ The environment damage caused by use of fertilisers in agriculture – see [“The real costs of intensive farming”](#)

16.4 Positive Externalities

Positive externalities exist when third parties benefit from the spill-over effects of production/consumption. For example:

- ▶ Social returns from investment in education & training
- ▶ Positive benefits from health care and medical research
- ▶ Improved social health outcomes arising from vaccination and immunisation programmes
- ▶ Provision of flood protection systems & fire safety equipment
- ▶ Restored historic buildings and monuments
- ▶ External benefits from people's usage of public libraries and museums
- ▶ Inoculations reduce incidence of meningitis

16.5 Difference between Private Costs and Social Costs

The existence of production and consumption externalities creates a divergence between **private and social costs of production** and also the private and social benefits of consumption.

- ▶ **Social Cost** = Private Cost + External Cost
- ▶ **Social Benefit** = Private Benefit + External Benefit

16.6 More on Negative Externalities

When negative production externalities exist, **social costs exceed private cost**. This leads to the private optimum level of output being greater than the social optimum level of production. The individual consumer or producer does not take the effects of externalities into their calculations.

16.6.1 External Costs from Production

Examples include noise pollution and atmospheric pollution from factories and the long-term environmental damage caused by depletion of our stock of natural resources

Consider this example drawn from a report published in July 2002 from the Environment Agency:

The Social Costs of Farming: Farmers cause £500m of environmental damage'

Farmers are increasingly escaping without penalty for environmental crimes despite causing unnecessary damage to the countryside put at £500m every year. The report estimated that the cost of damage to natural resources caused by agriculture was £1.2bn, offset by benefits of up to £0.9bn. It was estimated that in the short term £331m could be saved every year by adopting simple techniques and over a longer period savings could reach about £525m a year.

Farm chemicals are said to be poisoning some of the country's most valuable wildlife, including salmon, dragonflies and pearl mussels, and pose a serious threat to river environments.

16.6.2 External Costs from Consumption

Consumers can create externalities when they consume goods and services. Examples include pollution from cars and motorbikes and externalities created by smoking and alcohol abuse. Negative consumption externalities lead to a situation where the social benefit of consumption is less than the private benefit.

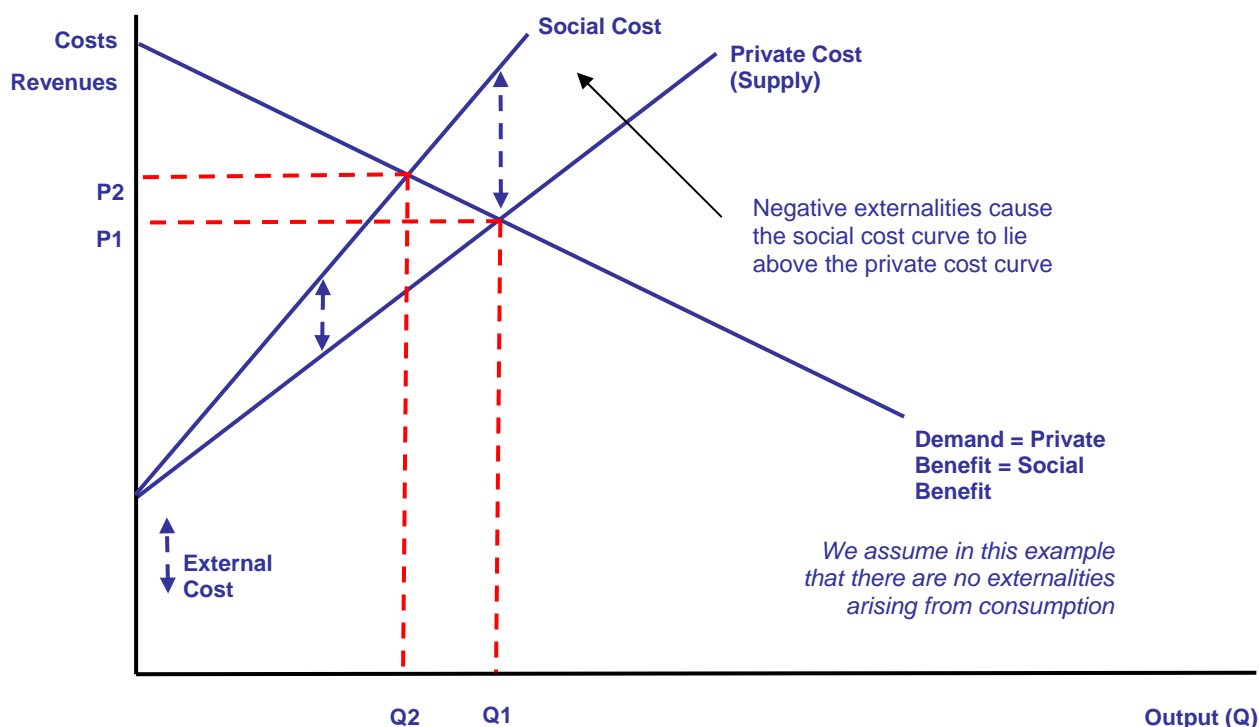
Consider this example of the estimated social costs arising from drug addiction in the UK. The report mentioned in the article was published in February 2002.

The Social Costs of Drug Dependency

Heroin and crack cocaine addicts are costing the country up to £19 billion a year, according to a study from experts at York University published in 2002. A hard core of problem drug abusers is running up a bill of £600 a week each in crime, police and court time, health care and unemployment benefits.

Last year, the NHS spent about £235 million on GP services, accident and emergency admissions and treatment linked to drug abuse. When social costs are added, the bill rises to between £10.9 billion and £18.8 billion. This figure is higher than earlier estimates. A Government White Paper outlining a 10-year drug strategy in 1998 said annual social costs were more than £4 billion.

There are at least 1.5 million recreational and regular users of Class A drugs. The average cost to society of all Class A drug users is £2,030 each a year, says the study.



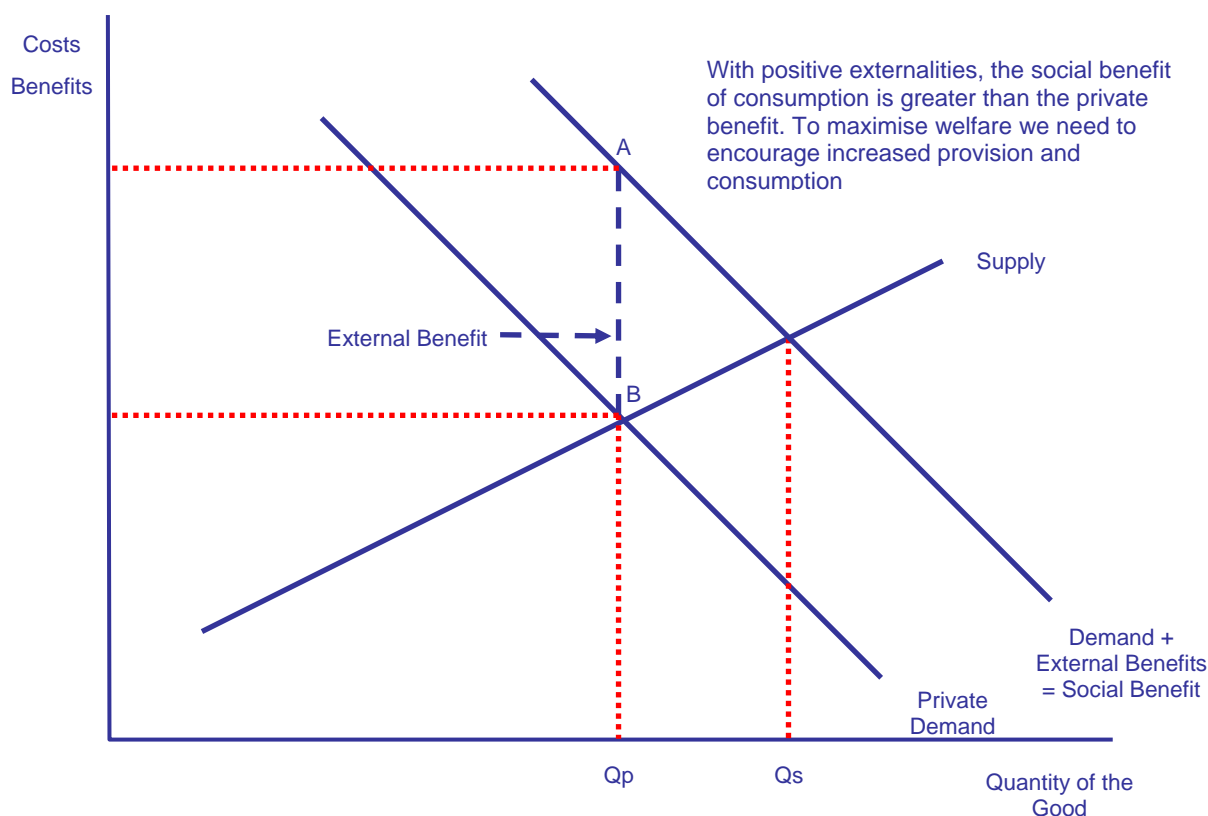
The diagram above refers to **negative externalities from production**. In the absence of externalities, the private costs of the supplier are the same as the costs for society. But if there are negative externalities, we must add the **external costs** to the firm's supply curve to find the **social cost** curve. This is shown in the diagram above.

If the market fails to include these external costs, then the equilibrium output will be Q_2 and the price P_2 . From a **social welfare** viewpoint, we want less output from production activities that create an **"Economic-bad"**. A socially-efficient output would be Q_1 with a higher price P_1 .

16.7 More on Positive Externalities

Positive externalities create **external benefits** beyond the people directly consuming a good or service. This means that the **social benefits** will exceed **private benefits**. Examples include:

- ▶ **Industrial training by firms:** This can reduce the training costs faced by other firms, and has important effects on labour productivity and efficiency in the economy as a whole
- ▶ **Education:** A well-educated labour force can increase efficiency and contribute to rising long term economic growth and increased prosperity for all
- ▶ **Health provision:** Improved health provision and health care reduces absenteeism and creates a better quality of life and higher living standards. See the section on merit goods in the chapter on fiscal policy



Where **positive externalities** exist, the good or service may be **under consumed** or **under provided** since the free market may fail to value them correctly or take them into account when pricing the product.

In the diagram above, the normal market equilibrium is at P1 and Q1 – but if there are external benefits, the Q1 is an output below the level that maximises social welfare.

There is a case for **intervention** designed to increase consumption towards output level Q2 so as to increase economic welfare.

16.7.1 Problems of Identifying and Valuing Externalities

Valuing external costs and benefits is difficult and controversial. There are two methods:

- ▶ **Ex-ante** (before the fact) valuations estimate the amount of money consumers are prepared to pay to avoid an externality – for example the price people might be willing to pay for insurance against an event occurring
- ▶ **Ex-post** (after the fact) valuations estimate the cost of putting right the externality (e.g. the costs of cleaning up a beach following an oil spill, of the economic costs of a road or rail accident)

Economists seek to place a monetary value on the spill-over effect. In practice estimating time-savings, loss of life or limb; environmental damage, lost countryside or loss a species is highly problematic. How would you estimate harmful impact of 'passive smoking' on non-smokers?

How do we value the loss of natural habitat resulting from the huge spillage of oil near the Spanish coastline which created an ecological disaster in the autumn of 2002?

16.8 Case Study: the External Costs of Obesity

During the summer of 2003, there was interest in the UK about the economic and social consequences of rising levels of obesity among both adults and children. There is a growing weight of medical evidence that links obesity to the risk of heart disease, diabetes, strokes and cancer.

The World Health Organisation (www.who.org) has warned that more than one billion adults globally are considered overweight and at least 300 million of them are obese. This is measured using the body-mass index, or BMI - a calculation that divides a person's weight in kilograms by their height in metres squared. A BMI of more than 30 is considered obese.

Report of the Chief Medical Officer for the UK

Obesity levels in England have tripled in the past two decades; around a fifth (21%) of men and a quarter of women are now obese whilst almost 24 million adults are now overweight or obese. Obesity is also rising among children - in the five years between 1996 and 2001, the proportion of obese children aged 6-15 years rose by some 3.5%.

Obesity is responsible for 9,000 premature deaths each year in England, and reduces life expectancy by, on average, 9 years.

Obesity costs the economy at least £2.5 billion a year - including costs to the NHS and cost to industry through sickness absence.

Obesity is a major cause of external costs - up to 8 per cent of healthcare costs in Western countries are linked to obesity and severe obesity is associated with a twelve-fold increase in premature mortality in people aged 25 to 35. The World Heart Federation has warning that obesity will overtake tobacco smoking as the biggest cause of heart disease unless the current trend of unhealthy lifestyles can be reversed.

The United States spends almost a tenth of its national healthcare budget on overweight patients, and in western countries as much as 2.8% of total sick care costs can be attributed to obesity. It is estimated that treating the side-effects of obesity costs the NHS in the UK £500 million a year but the wider cost to the economy is about £2 billion. But many of the external costs are extremely hard to value accurately

What can and should the Government do to respond to the social costs of obesity? Some economists are arguing that a new tax on high-fat foods will help to change relative prices in the marketplace and provide the right incentives for consumers to alter their spending behaviour. Other specialists are sceptical about the effectiveness of using taxation as a policy to control the problem. They believe that **imperfect information** lies at the root of the problem and that people need to become much better informed about the health consequences of obesity and should be encouraged to change their lifestyles through means other than taxation. There are threats that the major food company's may soon be the subject of legal action by some consumers over the long-term consequences of people eating high-fat processed foods.

Further background reading on this topic:

How do you really tackle obesity? <http://news.bbc.co.uk/1/hi/health/3037738.stm>

UK National Obesity Forum <http://www.nationalobesityforum.org.uk/>

Association for the Study of Obesity <http://www.aso.org.uk/>

Department of Health Annual Report of the Chief Medical Officer
<http://www.doh.gov.uk/cmo/annualreport2002/>

16.9 Government Intervention to Correct for Externalities and Market Failure

How can we take into account some of the third party effects that arise? Is there anything that the government can do?

The key is to “**internalise**” some or all of the external costs and benefits - i.e. to ensure that the businesses and consumers who create the externalities include them when making their decisions.

16.9.1 Pollution Taxes

Changing incentives by using the tax system

Well designed environmental taxes and other economic instruments can play an important role in ensuring that prices reflect environmental cost – in line with the “polluter pays” principle – and discouraging behaviour that damages the environment. The climate change and aggregates levies, for example, have sent strong environmental signals.

Environmental taxes can also be an efficient mechanism for improving the productivity of natural resources, in line with the wider productivity improvements the Government is seeking to make across the economy. Of course any Government intervention must be proportionate and well-targeted, and needs to take into account other factors such as distributional effects and business competitiveness.

Source: Government Pre-Budget Report, November 2002

One common approach to adjust for externalities is to tax those who create negative externalities. This is sometimes known as **“making the polluter pay”**. Introducing a tax increases the private cost of consumption or production and ought to reduce demand and output for the good that is creating the externality. Taxes send a **signal** to polluters that our environment is valuable and is worth protecting.

Some economists argue that the flow of income from pollution taxes should be **ring-fenced** and allocated to projects that protect or enhance our environment. For example, the money raised from a congestion charge on vehicles entering busy urban roads, might be allocated towards improving mass transport services; higher taxes on cigarettes might be used to fund better health care programmes.

16.9.2 Examples of Environmental Taxes

- ▶ **The Landfill Tax** - this tax aims to encourage waste producers to produce less waste, recover more value from waste, for example through recycling or composting and to use more environmentally friendly methods of waste disposal. The tax applies to active and inert waste, disposed of at a licensed landfill site
- ▶ **The Climate Change Levy** - a tax on the use of energy in industry, commerce and the public sector, with offsetting cuts in employers' National Insurance Contributions and additional support for energy efficiency schemes and renewable sources of energy.

Energy intensive industry sectors have so far signed more than 50 agreements with formal targets for cutting carbon emissions and tackling climate change – this allows them an 80% reduction in their climate change levy payments

- ▶ **The Fuel Duty Escalator** – higher real duties on petroleum products designed to reduce the growth of demand for fuel arising from private transport
- ▶ **The Aggregates Tax** - the purpose of the levy is to reduce the environmental costs associated with quarrying operations (noise, dust, visual intrusion, loss of amenity and damage to biodiversity). It also aims to reduce demand for aggregate and encourage the use of alternative and recycled materials where possible
- ▶ **The Congestion Charge**: -designed to cut traffic congestion in inner-London by charging motorists £5 per day to enter the central charging zone
- ▶ **Plastic Bag Tax** - In Ireland a pioneering new 15 cent levy on plastic shopping bags was launched in March 2002. The levy is designed to encourage people to use reusable bags and has stimulated an increase in the availability of biodegradable bags. Payable in all sales outlets 15 cents are charged for each bag issued and itemized separately on receipts. Proceeds from the tax go to the Environment Fund and are used to fund various waste management and other environmental initiatives.

16.9.3 Problems with Environmental Taxes to Curb Pollution

- ▶ **Efficient policies**: i.e. does a particular policy result in a better use of scarce resources among competing ends? E.g. does it improve allocative, productive and/or static efficiency and therefore lead to an improvement in economic welfare. For example: Will higher indirect taxes on aircraft fuel be an efficient way of reducing the external costs linked to the rapid growth of aviation transport?

- ▶ **Effectiveness:** i.e. which environmental policy is most likely to meet a specific objective? For example which policies are likely to be most effective in reducing road congestion? Can government policies reduce carbon emissions at lowest feasible cost? Evaluation can also consider which policies are likely to have an impact in the short term when a quick response from consumers and producers is desired. And which policies are likely to prove most cost-effective in the longer term?
- ▶ **Equitable policies:** i.e. is a policy fair or does one group in society gain more than another? Consider for example some of the equity issues involved in the government imposing higher taxes on household waste collection; cigarettes; domestic fuel or introducing a new tax on aviation fuel.
- ▶ **Sustainable policies:** i.e. does a policy reduce the ability of future generations to engage in economic activity and share the benefits of a rising standard of living? The government is committed to sustainable economic development and many environmental taxes and other policies are geared towards meeting objectives linked to this

Although environmental taxes are used with increasing frequency by governments to deal with environmental externalities, we must evaluate the difficulties in relying on taxation to correcting for market failure.

Many economists argue that explicit pollution taxes can create further problems which lead to government failure and little sustainable improvement in environmental conditions. The main problems are as follows:

- ▶ **Assigning the right level of taxation:** There are problems in setting tax so that private marginal cost will exactly equate with the social marginal cost. The government cannot accurately value the private benefits and cost of firms let alone put a monetary value on externalities such as the cost to natural habitat, the long-term effects of resource depletion and the value of human life
- ▶ **Imperfect information:** Without accurate information setting the tax at the correct level is virtually impossible. In reality, therefore, all that governments and regulatory agencies can hope to achieve is a movement towards the optimum level of output.
- ▶ **Consumer welfare effects (important issue of equity):** Taxes reduce output and raise prices, and this might have an adverse effect on consumer welfare. Producers may be able to pass on the tax to the consumers if the demand for the good is inelastic and, as result, the tax may only have a marginal effect in reducing demand and final output

Taxes on some de-merit goods (for example cigarettes) may have a regressive effect on lower-income consumers and lead to a widening of inequalities in the distribution of income.

Having said this, it should be possible for authorities to develop “smart tariffs or taxes” where account is taken of the economic impact of pollution taxes on vulnerable households such as low income consumers.

The current Labour government has reduced the rate of VAT on domestic fuel to the EU minimum rate of 5%, but the government has no plans to introduce a domestic energy tax (which would be an explicit environmental tax) because of the huge numbers of low-income households that currently live in fuel poverty.

The government could readily increase VAT on fuel and other forms of energy but use the welfare benefits system to compensate those lower-income households that were most affected – the political will to go down this route appears to be absent with the Government at the present time

- ▶ **Employment and investment consequences:** If pollution taxes are raised in one country, producers may shift production to countries with lower taxes. This will not reduce global pollution, and may create problems such as structural unemployment and a loss of international competitiveness. Similarly higher taxation might lead to a decline in profits and a fall in the volume of investment projects that in the long term might have beneficial spill-over effects in reducing the energy intensity of an industry or might lead to innovation which enhance the environment.

“Eco-tax” reformers often argue that the introduction of pollution taxes should be revenue neutral – e.g. an increase in environmental taxation might be accompanied by reductions in employment taxes such as national insurance contributions so that the employment consequences of higher taxation are minimised

It might be more cost effective for governments to switch away from pollution taxation to direct subsidies

to encourage greater innovation in designing cleaner production technologies

The impact of green taxes depends crucially on what is done with the revenues. If they are balanced by reducing other taxes through 'revenue recycling', research suggests that green taxes could result in an overall economic improvement

- **Limitations to international pollution taxation:** Introducing global environmental taxation is virtually impossible because we are not even close to achieving global government – but a European-wide system of pollution taxes might be a way forward (as part of European fiscal harmonisation)

16.10 Case Study: Evaluation of the Arguments for and against Higher Fuel on Petrol and Aviation Fuel

Government intervention in a market is normally justified on the grounds of market failure – i.e. the failure of the market mechanism to achieve a socially optimum allocation of resources.

Taxation is often introduced when production and consumption generates negative externalities so that the social cost exceeds the private cost. If motorists and aviation companies fail to take into account the externalities that result from their activities, there is a strong danger that the free market will fail to adequately account and compensate for the externalities caused. There are numerous examples of externalities that arise from both motor and air transport (including noise and air pollution) although the extent of the external costs will vary according to the volume and location of the traffic on roads and in the skies.

The case for higher fuel taxes

A pollution tax both on motor and aviation fuel would increase private costs and help to internalize some of the externalities thereby reducing demand and taking output closer towards a social optimum and reducing the incidence of pollution and loss of social welfare. This is shown in the diagram below. Such taxes are not designed to curb output to zero – but to control production and consumption and also provide an incentive for producers and consumers to find more environmentally friendly alternatives – in this case modes of transport that create less pollution. Emissions from aircraft are a major contributor to global warming. According to a recent study from the Royal Commission on Environmental Pollution

Royal Commission on Environmental Pollution (2002)

"Short-haul passenger flights, such as UK domestic and European journeys, make a disproportionately large contribution to the global environmental impacts of air transport and these impacts are very much larger than those from rail transport over the same point-to-point journey."

Higher taxes will promote alternative and more environmentally sustainable modes of transport (i.e. high-speed rail links between major cities)

Revenue from pollution taxes can be earmarked (hypothecated) to compensate those affected or invested in research to develop alternative fuels and new engine designs

Not taxing the aviation industry is equivalent to the industry receiving a "hidden subsidy" which distorts the working of the market and has contributed to a huge surge in demand for air travel which is leading to increased congestion. Without a tax on aviation fuel, the demand for new runways and airports will continue to grow threatening environmental resources

Arguments against higher motor and aviation fuel taxes

The aviation and motor industries create social benefits as well as social costs – for example the aviation industry has brought many benefits to society in both economic and social terms. The relative affordability and speed of air transport today have made international travel accessible to many people who would never previously have had the time or financial means to enable them to travel overseas.

Nobody can agree on the precise environmental costs of motoring and aviation. The "estimated" annual environmental cost of aviation in the UK might be anywhere from £2 billion to £10 billion – which makes it virtually impossible to find an optimum tax level for the industry. Estimates for the cost of the CO₂, nitrogen and sulphur oxides, hydrocarbons, water vapour and other gunk spewed out by airplanes ranges from £1 billion to £6 billion a year

There is a danger that a UK-only tax would have a damaging effect on UK aviation companies such as EasyJet and British Airways British airlines unless a new fuel tax was imposed internationally

Aviation companies would not be able to pass on most of the tax to their customers because demand is more elastic (due to high levels of market competition). The tax would lead to reduced demand, lower profit margins and fewer routes flown and a fall in investment and employment could have severe consequences not just for the aviation industry but the economy as a whole

Aviation contributes £10 billion (\$16 billion) to the British economy annually and supports, directly or indirectly, more than 700,000 jobs according to a recent article in the Economist

Would a new aviation tax differentiate between short-haul flights and long-distance flights? The environmental effects are different for each. So too are the pollution effects arising from freight aviation and air passenger transport

What are the Alternatives to Higher fuel taxes?

Congestion charging and other forms of road pricing might be mentioned with regard to motor fuel and changes to landing charges and tighter government regulations on aircraft noise and engine technology might also be introduced. The airline companies argue against higher fuel duties and some are lobbying instead for the development of a traded pollution permits system similar to that raised at the Kyoto summit. The Royal Commission proposes an emissions charge rather than blanket increases in fuel duty

Emissions Charging – A More Effective Flight Path

Instead of a fuel tax, therefore, a better way of addressing the market distortion would be a Europe-wide emissions charge, which airports would be required to levy on all aircraft, passenger or freight, taking-off from or landing at European airports. The charge would be differentiated between aircraft types and loads and the distance travelled over Europe, or over the ocean to the point mid-way to the nearest country in the direction of the flight, to reflect their estimated emissions.

Royal Commission Report, November 2002

Equity considerations should also be given a mention. One of the standard arguments against higher motor fuel duties is that they have a regressive effect on low-income households who struggle to finance the ownership and use of a car and that higher fuel duties affect people in rural areas who create little or no congestion but whose use of a car in areas not served by public transport links is absolutely necessary. Are equity considerations as strong with aviation taxes? Probably not because of the higher incomes of those who travel by air regularly although the low cost airline expansion is changing this.

16.11 Command and Control Techniques – Regulation of Pollution

Laws can be used. For example, the [Health and Safety at Work Act](#) covers all public and private sector businesses. Local Councils can take action against noisy, unruly neighbours and can pass by-laws preventing the public consumption of alcohol. Cigarette smoking can be banned in public places.

In the United States the state of California is the only state empowered to set its own pollution standards. Laws are passed that restrict the emissions of carbon dioxide and other greenhouse gases from cars and trucks.

16.12 Emissions Trading – The Expansion of Marketable Pollution Permits

Some countries have moved toward [market-based incentives](#) to achieve pollution reduction. This new approach involves the creation of a limited volume of pollution rights, distributed among firms that pollute, and allows them to be traded in a secondary market. The intent is to encourage lowest-cost pollution reduction measures to be utilized, in exchange for revenues from selling surplus pollution rights. Companies that are efficient at cutting pollution will have spare permits that they can then sell to other businesses. As long as the total bank (or stock) of permits is reduced year by year by the government or an agency, cuts in total pollution can be achieved most efficiently.

Quite simply, limiting emissions makes polluting a scarce resource, and scarcity brings economic value.

Emissions' trading is a central feature of the Kyoto Protocol and the European Commission has proposed that EU-wide trading at company level will start in 2005. In short trading is designed to reduce the cost of achieving sustainable cuts in greenhouse gas emissions and secondly to extend the principle of property

rights as a means of meeting environmental objectives.

The UK emissions-trading scheme is best described as 'voluntary cap and trade'

The British Government launched in August 2001 a £215 million Emissions Trading Scheme which aims to cut up to two million tonnes of carbon a year from the atmosphere by 2010 and generate new job and investment opportunities for industry. The maximum that any one company can receive is 20% of the total £215m amount or £43million.

Some of the participants include Barclays, British Airways, BP, Caterpillar, General Domestic Appliances, Rolls-Royce, Sainsbury's, Somerfield, Shell, TotalFinaElf and Whitbread Hotels.

The UK emissions trading scheme is the world's first greenhouse gas emissions trading scheme. 34 organisations have voluntarily taken on a legally binding obligation to make absolute reductions against their (baseline) pollution emission levels in 1998-2000 in exchange for an incentive payment. The targets (which are 11% on average from baseline) and the price per tonne (£53.37) was established in a March 2002 auction

Under the scheme firms sign up to delivering emission reduction targets which can either be made by cuts in-house or by buying and selling emission 'allowances' on the market to meet those targets. If firms can reduce emissions cheaply and beat their targets, they can sell the surplus allowances or bank them for future use. The government has pledged up to £215m over five years from 2003-04 to provide incentive payments for companies to join the scheme. This will be allocated through an auction – the auction in 2002 saw the maximum number of pollution permits being sold among the 34 participating companies.

Across the whole pollution trading scheme, those companies with lowest cost emission reduction opportunities (i.e. those who can achieve cuts in pollution most efficiently) will tend to sell allowances to those with higher cost options thus reducing the overall cost of delivering the environmental benefits

The Emissions Trading Scheme is a part of the UK Climate Change Programme, which sets out how the UK intends to meet its Kyoto Protocol Commitment of a 12.5% reduction on 1990 levels of all greenhouse gases by 2008-2012, and move towards a domestic goal of a 20% reduction in carbon dioxide, the main greenhouse gas

16.12.1 Is Emissions Trading the Future?

More and more companies are likely to join the scheme because it is seen as a fore-runner for a European-wide system of emissions trading

It does not matter who emits carbon – what matters is reducing the aggregate amount of carbon emissions and finding the most efficient means of achieving this

Efficiency emerges from free trading – i.e. a market-determined, lowest-cost 'price of carbon' emerges from the trading market

Many more companies are now measuring carbon emissions and the number of socially responsible investment trusts is widening – pollution reductions may well become an indicator of corporate performance and have some impact on share prices

Power generators currently excluded from the voluntary trading platform

Emissions trading is only part of the solution – consumer behaviour also needs to change

16.12.2 Subsidising Positive Externalities

Activities that lead to positive externalities can be **subsidised**. This reduces the costs of production for suppliers and encourages a higher output. For example the Government may subsidise state health care; public transport or investment in new technology for schools and colleges to help spread knowledge and understanding. There is also a case for subsidies to encourage higher levels of training as a means to raise labour productivity and improve our international competitiveness.

More than one policy needed to control pollution

Achieving reductions in environmental pollution will never be based on a clear choice between policy levers – emissions trading or pollution taxation, building regulations or voluntary agreements – but on pulling multiple levers simultaneously – trading and taxation regulations and voluntary agreements – investment grants and allowances and research support.

(Adair Turner, speech to the Carbon Trust May 2003)