

The National Air Quality Strategy

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In August 1996, the Government produced a consultation draft of a National Air Quality Strategy for the UK. A final version of the Strategy is expected to be published before the general election, which will set air quality objectives to be achieved by the year 2005. Local authorities will have to review and assess air quality, and draw up action plans to meet the new objectives where necessary. These plans are likely to include local traffic management proposals and will be complemented with new powers for councils to stop and test vehicle emissions. This paper examines the aims and objectives of the new Strategy, the requirements which it will place on different sectors of the community, and in particular, how local authorities will implement the new regime of local air quality management.

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Summary

In August 1996, the Government produced a consultation draft of a National Air Quality Strategy for the UK. A final version of the Strategy is expected to be published before the general election.

The Government acknowledges that, without further action, periods of poor air quality will persist in the UK, mainly because of the continuous increase in road traffic, a major source of air pollution. It therefore proposed a new Strategy which sets measurable air quality objectives, to be met by the year 2005. The Government believes that existing programmes which control pollution from industrial plant and Europe-wide policies to improve vehicle fuel and emissions standards will go a long way to meeting its targets.

While the Strategy identifies a role for business, industry and transport, there will be no new national policies or targets for these sectors. Instead, the bulk of the responsibility for achieving air quality objectives rests with local authorities. They will be given duties to review and assess local air quality, and draw up action plans to meet the Government's air quality objectives where necessary. Action plans are likely to include new, local traffic management proposals and will be complemented with new powers for councils to stop and test vehicle emissions.

The draft National Air Quality Strategy has been given a cautious welcome by environmental organisations and local authorities, although there are concerns that *provisional* air quality targets for some pollutants could be relaxed at a later stage, and doubts exist as to whether local authorities will be adequately funded to carry out their new duties.

The paper examines the current need to tackle air quality problems in a comprehensive manner and summarises the aims and objectives of the new National Air Quality Strategy. It investigates the requirements which the Strategy will place on different sectors of the community, and in particular, how local authorities, as key components of the Strategy, will implement the new regime of local air quality management. The paper summarises the views of some of the organisations who have commented on the Strategy.

I Introduction

A. Sources of Air Pollution in the UK

Motor vehicles are now widely acknowledged as the single major source of air pollution in urban areas, and can also contribute to poor air quality in rural locations. Road transport accounts for substantial emissions of carbon monoxide (CO), oxides of nitrogen (NO_x), volatile organic compounds (such as benzene) and small, airborne particles and smoke, known as PM₁₀. Significant emissions also arise from industry. Power stations, for example, are responsible for over 60% of sulphur dioxide (SO₂) emissions¹ and other industries create around 70% of PM₁₀². The specific concern over emissions from road transport, however, is fuelled by forecasts in road traffic growth, which predict that traffic will have increased by 83-142% compared to 1988 levels by 2025³.

B. The Formation of Poor Air Quality

Periods of poor air quality lasting from several hours to a few days are referred to as "pollution episodes". There are essentially two types of episode. The first is the problem common to urban areas on cold, still days, when emissions from sources such as a cars are trapped at ground level by a layer of colder air above. These pollutants, emitted directly from a source into the atmosphere, are known as "primary pollutants". Such episodes occur most frequently in winter, when still, cold weather is more likely.

In summer the action of sunlight on the primary pollutants forms ground-level ozone (O₃). The ozone at ground level is the same as that in the ozone layer, but whilst the ozone layer is beneficial in screening out harmful ultraviolet radiation, at ground level it is an aggressive irritant. The formation of ground-level ozone can take anything from several hours to days to complete, and can form considerable distances downwind of the original source of pollution. It is for this reason that rural areas can suffer equally from poor air quality during the summer.

¹ Royal Commission on Environmental Pollution *Eighteenth Report: Transport and the Environment* Cm 2674.

² Department of the Environment/Quality of Urban Air Review Group *Airborne Particulate Matter in the United Kingdom* Third Report, May 1996.

³ Reference 1.

C. The Health Effects of Air Pollution

Research over many years has established that air pollution can cause a range of health effects. They vary according to the amount of pollution present in the air, how long it remains there, and how vulnerable people are to it. This latter point is extremely important, as the effects of air pollution vary tremendously from person to person.

1. Asthma and Respiratory Diseases

Principally, air pollution affects the respiratory (breathing) system, as this is the main point of contact between inhaled polluted air and the more delicate tissues of the body. This causes health effects by irritating the airways of the lungs and linings of the nose and throat^{4,5,6}. This may lead to inflammation and provoke a coughing reaction, wheeziness, and tight-chestedness, or in more severe cases, emphysema and bronchitis. The condition which has received most attention in the scientific community and media, however, is the large increase in numbers of asthmatics, which has coincided with rising levels of some air pollutants.

The most recent report to question the link between asthma and air pollution was published⁷ by the Department of Health's Committee on the Medical Effects of Air Pollutants (COMEAP)⁸ in 1995. The report concluded, controversially, that most of the available evidence did not support a causative role for outdoor air pollution making people asthmatic and that factors such as infections and allergens were generally much more important than air pollution in provoking attacks.

⁴ Expert Panel on Air Quality Standards/Department of the Environment *Sulphur Dioxide* HMSO London 1995.

⁵ Expert Panel on Air Quality Standards/Department of the Environment *Nitrogen Dioxide* HMSO London 1996.

⁶ Expert Panel on Air Quality Standards/Department of the Environment *Ozone* HMSO London 1994.

⁷ Department of Health/Committee on the Medical Effects of Air Pollutants *Asthma and Outdoor Pollution* HMSO London 1995.

⁸ The Committee on the Medical Effects of Air Pollutants was set up in 1992 by the Department of Health under Professor Stephen Holgate of the University of Southampton. The COMEAP subgroup on Asthma and Outdoor Air Pollution was set up in October 1992 to advise on the possible links between outdoor air pollution and asthma. Its Chairman was Professor Ross Anderson, Professor of Public Health Sciences, St. George's Hospital Medical School.

In addition to long-standing concern over the main gaseous pollutants, much recent attention has focused on particulate matter in the urban environment, especially PM₁₀⁹. Most of the particulate emissions in urban areas originate from diesel fuelled vehicles¹⁰, which emit around 100 times more particulates per mile than cars running on unleaded petrol¹¹. PM₁₀ has only really come to light as a potentially significant health problem in the past two to three years, a period which coincided with the promotion of diesel cars as being greener than petrol ones because of their fuel economy, lower emissions of CO, hydrocarbons and NO_x, and the fact that they have longer working lives.

One of the first major studies to highlight the impact of PM₁₀ on heart and lung disease was of six cities in the United States, and was reported in 1993¹². Further studies, reviewed by the Government's Expert Panel on Air Quality Standards (EPAQS)¹³ have reinforced the association between concentrations of PM₁₀ and excess deaths among elderly people already suffering from chronic heart and lung disease¹⁴. The World Health Organisation (WHO) estimates that a 50 µg/m³ increase in daily average PM₁₀ concentrations¹⁵ will increase daily mortality in the population by 5% and increase hospital admissions for respiratory diseases by 10%¹⁶.

A slightly smaller change (40 µg/m³) was estimated by the WHO to cause a 20% change in the number of asthmatic patients noticing exacerbation of their symptoms. EPAQS highlighted in their report, however, the difficulty in isolating possible confounding factors which may have affected the results of the studies it reviewed - notably that air pollution levels are likely to be highest in cities, and the incidence of heart and lung disease, cigarette smoking, poverty, poor housing and unemployment, all of which contribute towards heart and lung disease in their own right, is also highest in cities. It concluded, however, that further studies would be unlikely to be able to produce more reliable results than those it had examined.

⁹ PM₁₀ is particulate matter of ten microns or less in diameter. This is equal to one hundredth of a millimetre.

¹⁰ Reference 2.

¹¹ House of Commons Transport Committee Sixth Report *Transport-Related Air Pollution in London* 19 October 1994 HC 506-I 1993-94.

¹² Dockery, D.W. *et al* (1993) An Association Between Air Pollution and Mortality in Six US Cities *New England Journal of Medicine* **329**, 1753 - 1759.

¹³ EPAQS was established following the Government's commitment in the 1990 White Paper *This Common Inheritance* to set up a Panel to recommend air quality standards for the UK. It is chaired by Professor Anthony Seaton of the Aberdeen University Medical School and members include medical and air pollution experts.

¹⁴ Expert Panel on Air Quality Standards/Department of the Environment *Particles* HMSO London 1994.

¹⁵ Air pollution is usually expressed either as parts per billion (ppb) or microgrammes of the pollutant per cubic metre of air (µg/m³). One microgramme is equal to one millionth of a gramme or one thousandth of a milligramme.

¹⁶ World Health Organisation Regional Office For Europe *Update and Revision of the Air Quality Guidelines for Europe* Copenhagen 1995.

The EPAQS report on particles coincided with the publication of another COMEAP report¹⁷ on airborne particles. COMEAP came to the same broad conclusions, that a healthy person would not be affected by typical levels of particulates found in ambient air in the UK, but that there was some "evidence of an association between levels of particles such as those encountered in the UK and acute effects on people with respiratory and cardiac disease, ranging from exacerbated symptoms to earlier death".

Although the weight of evidence would seem to point to the effects of PM₁₀ only being felt on the elderly with pre-existing lung and heart problems, the scale of the impact of particulates on mortality has been highlighted by estimates of the number of excess deaths they cause: in the order of 10,000 per year in Britain¹⁸, 60,000 per year in the US¹⁹ and 460,000 worldwide²⁰.

2. Cancers

Whilst there may be disagreement over the extent to which air pollution is implicated in asthma and other respiratory diseases, it has other health effects which are undisputed. Some volatile organic compounds (VOCs), the most notable examples of which are benzene and 1,3 butadiene, are carcinogenic (cancer-causing). Benzene is emitted from exhausts and evaporates from petrol in vehicles, refineries and filling stations²¹. Unlike benzene, which is present in petrol and diesel, 1,3 butadiene mainly derives from the combustion process within vehicles²².

Both these compounds are genotoxic, which means that they can alter the genetic material of the cells of the body. There are considered to be no safe levels of genotoxic compounds in the environment. Studies of workplace exposure and laboratory experiments have shown that benzene and 1,3 butadiene can increase the risk of developing cancers of various tissues as well as leukaemia^{23,24} (the latter particularly in the case of benzene). Although the levels of VOCs experienced in workplace studies are not directly representative of the typical outdoor

¹⁷ Department of Health/Committee on the Medical Effects of Air Pollutants *Non-Biological Particles and Health* HMSO London 1995.

¹⁸ "Words alone will not clear smog" *New Scientist* 26 October 1996 p.6.

¹⁹ "Dustup over EPA's Particulate Standard" *Science* 1 November 1996 p.709.

²⁰ "Patience Exhausted" *Scotland on Sunday* 13 October 1996 p.13.

²¹ Expert Panel on Air Quality Standards/Department of the Environment *Benzene* HMSO London 1994.

²² Expert Panel on Air Quality Standards/Department of the Environment *1,3 Butadiene* HMSO London 1994.

²³ Reference 21.

²⁴ Reference 22.

environment, studies of workers often involve reasonably fit and well males, and the effects of a pollutant on more vulnerable sectors of the population are taken into account when air quality standards are derived from such studies.

In 1994, both the Royal Commission on Environmental Pollution and the House of Commons Transport Committee questioned the need for benzene to be present in fuel during inquiries into transport and the environment^{25,26}. This followed a major campaign, accompanied by legislation in the 1980s, to reduce the lead content of petrol. Drivers of cars which could not run on the new lower octane unleaded petrol were encouraged to use "super unleaded" petrol as the "green" alternative to remaining with four star. However, more benzene is added to super unleaded fuel to compensate for the lead. Evidence given to the Commission and Transport Committee revealed this paradox, and in its report, the Commission recommended that the Government "act to end the sale of unleaded super premium petrol"²⁷. Super unleaded fuel has now all but disappeared from the market.

D. Monitoring Air Quality

Air quality is monitored by two principal methods: continuous monitoring, which provides real-time data on air pollution levels; and non-automatic monitors which are generally cheaper methods to average pollution levels over a specific period, such as a week or month. The Department of the Environment (DoE) operates several air quality monitoring networks²⁸. The Automated Urban Network (AUN) monitors levels of SO₂, NO_x, CO, ozone and PM₁₀ at kerbside and urban background levels. A hydrocarbon network consisting of 12 sites monitors urban hydrocarbon levels including benzene and 1,3 butadiene as part of the AUN. The Automated Rural Network mainly measures ozone levels, with a few sites also measuring SO₂ and NO_x. As at 1st May 1996, there were 61 DoE air quality monitoring stations in operation in the UK²⁹. In addition to these, many local authorities operate their own continuous air quality monitoring stations, some of which are affiliated to the Government's automated network.

Both the Government and local authorities also operate *non-automatic* monitoring networks. SO₂ and black smoke are measured by the Government's Basic Urban Network and the EC Directive Network and its TOMPS (toxic organic micro-pollutants) network monitors levels

²⁵ Reference 1.

²⁶ Reference 11.

²⁷ Recommendation 10.

²⁸ Department of the Environment *Digest of Environmental Statistics No. 18 1996* HMSO London June 1996.

²⁹ AEA Technology *Air Quality in the UK* NETCEN/Department of the Environment, August 1996.

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substances such as dioxins. Local authorities have samplers for smoke and SO₂ as well as around 1,100 non-automated monitoring points across the country to monitor for nitrogen dioxide (NO₂), the most irritant form of the NO_x gases.

Information gathered from the monitoring networks is stored in the National Air Quality Archive, which is maintained, together with the National Atmospheric Emissions Inventory, by NETCEN³⁰. Daily information and health advice on current air quality, with 12 hour air quality forecasts, are available to the public through CEEFAX and TELETEXT. The DoE provides an interactive Freephone telephone number (0800-556677), and current air quality information is also available on the Internet³¹ as are the archive and emissions inventory³².

The current system of air quality information categorises air quality into a number of bandings: "very good", "good", "poor" or "very poor", depending upon hourly concentrations of pollution levels. There has been some criticism over the existing air quality bandings, including complaints that there is no category between good and poor, so that a very small change in pollution levels can make air quality become good as opposed to poor, and vice versa. The Government recently issued a consultation paper on modifying the bandings system³³. It proposes replacing the "good" banding with a "moderate" banding and suggests that bandings be centred on three new thresholds:

- (i) the level of the new air quality standards in the Strategy;
- (ii) an information threshold, above which air quality essentially is poor; and
- (iii) an alert threshold.

E. Air Quality Standards

Levels of air pollution are assessed according to air quality standards. A range of standards has been produced by the EC, WHO, the United Nations and the Government. Most are health-based standards, although the UNECE³⁴ recommends standards for the protection of vegetation. The EC standards, enshrined in directives, are the only mandatory air quality standards at present in the UK (the Government has stated in the draft National Air Quality

³⁰ National Environmental Technology Centre.

³¹ <http://www.open.gov.uk/doe/doehome.htm>

³² <http://www.open.gov.uk/doe/envir/aq/aqinfo.htm>

³³ Department of the Environment *An Air Quality Public Information System for the United Kingdom - A Consultation Paper* January 1997.

³⁴ United Nations European Economic Commission for Europe.

Strategy that it has no plans to introduce its own statutory air quality standards). Member States are required have to have in place networks to monitor compliance with the directives for smoke and SO₂³⁵, NO₂³⁶, ozone³⁷ and lead³⁸. Each specifies various limits or guidelines for the pollutant concerned. The approach taken differs between the directives. The AUN is used to monitor UK compliance with the directives on ozone and NO₂. SO₂ and smoke compliance is measured by the Government's EC Directive Network. Local authority air quality monitoring networks do not have to comply with the EC directives.

The Government's air quality standards are those recommended by EPAQS (see Chapter II). The Government states that its air quality standards "represent the levels of air pollutants at which there would be an extremely small or no risk to human health"³⁹. The EPAQS standards have all been recommended within the past three years, and as such are among the most up-to-date to consider recent scientific studies of the health effects of pollutants. The EC directive standards, on the other hand, were derived during the 1980s, and as a result, there is some conflict between them and those recommended by EPAQS. EPAQS, for example, has recently recommended a standard for NO₂, which is considerably more relaxed than the current EC directive value.

F. Current Air Quality in the UK

The most recent published data on air quality in the UK is for 1994⁴⁰. Department of the Environment data⁴¹ shows that there were exceedances of the EPAQS standards (periods of air quality in the DoE "poor" banding in the case of NO₂) at 40 of the 50 DoE continuous monitoring stations operating at that time. At five of the stations, EPAQS standards were exceeded on 50 days or more. The worst pollution episodes in recent years have been in 1991 and 1994. The 1991 episode lasted from 12th-15th December and nitrogen dioxide concentrations exceeded 400 ppb in London, four times the current EPAQS recommendation. During the main 1994 episode, concentrations of PM₁₀ in Belfast reached 500 µg/m³ between December 21st and 22nd. The hot summer of 1995 led to significant exceedances of the EPAQS ozone standard (50 ppb as an 8-hour running mean) across the country. Ozone levels reached 127 ppb at the Yarner Vale monitoring station in Devon on 2nd August. More frequent, but less severe, exceedances of air quality standards are commonly monitored at DoE and local authority sites.

³⁵ 80/779/EEC *OJ L229* 30 August 1980.

³⁶ 85/203/EEC *OJ L87* 27 March 1985.

³⁷ 92/72/EEC *OJ L297* 21 September 1992.

³⁸ 82/884/EEC *OJ L378* 31 December 1982.

³⁹ Department of the Environment/Welsh Office/Scottish Office *The Air Quality Regulations 1997 Draft for Consultation* November 1996.

⁴⁰ For a complete year.

⁴¹ Reference 29.

II The National Air Quality Strategy

A. Origins of the Strategy

The need to manage local air quality was identified as a key issue for sustainability in the Government's sustainable development strategy for the UK⁴². On 23rd February 1994, the Secretary of State for the Environment, John Gummer, announced that the Government would issue a discussion paper, comments from which would form the basis of a strategy to be published that autumn for dealing with air quality. Shortly afterwards, the green paper, *Improving Air Quality*⁴³, was issued. The paper set out the Government's views on setting, achieving and maintaining air quality standards for the UK, and on a new framework of local air quality management.

The air quality strategy was not forthcoming in the autumn of 1994, however. Instead, in January 1995, the Government produced a second document outlining its "strategic policies for air quality management"⁴⁴. This committed the Government to publish the strategy later in the year and issue guidance to local authorities by the end of 1995 on assessing and managing air quality. The duty to produce the strategy and provisions for the duties and powers required for its implementation were added at a late stage as amendments to the *Environment Act 1995*, which received Royal Assent on 19th July 1995.

A consultation draft of the National Air Quality Strategy was published in August 1996⁴⁵, the delay attributed by the environmental journal *ENDS* "in part because of attempts by the Department of Trade and Industry and the Department of Transport to weaken the proposed air quality targets"⁴⁶. The final version has yet to be issued, although the Government is aiming to publish the final Strategy before the general election.

Publication of the draft National Air Quality Strategy coincided with the adoption of a new EU directive⁴⁷ on ambient air quality assessment and management, which seeks to harmonise the monitoring of air quality and implementation of standards across Member States⁴⁸. Under

⁴² *Sustainable Development: The UK Strategy* January 1994 Cm 2426.

⁴³ Department of the Environment *Improving Air Quality: A Discussion Paper on Air Quality Standards and Management* March 1994.

⁴⁴ Department of the Environment *Air Quality: Meeting the Challenge* January 1995.

⁴⁵ Department of the Environment/Welsh Office/Scottish Office *The United Kingdom National Air Quality Strategy Consultation Draft* August 1996.

⁴⁶ *ENDS Report* June 1996 pp. 15-18.

⁴⁷ 96/62/EC *OJ L296* 27 September 1997.

⁴⁸ *ENDS Report* July 1994 p.41.

this framework directive, Member States will have to draw up short term plans indicating measures which will be taken if limit values for air pollutants are being exceeded, and these may include measures to control the activities which are causing the exceedances, including motor vehicle traffic control. The Government anticipates that many of the structures set up under the Strategy and provided for by the *Environment Act* will be the basis for the UK to meet its commitments under the framework directive.

B. Aims and Objectives

The overall aim of the draft National Air Quality Strategy is the achievement by the year 2005 of air quality objectives for eight of the main air pollutants. The Government pointed out at the launch of the draft Strategy on 21st August 1996 that the air quality standards which it contained "will offer everyone - even those most sensitive to air pollution - a very high level of protection"⁴⁹. John Gummer further stated that achieving the targets would put an end to summer- and wintertime smog episodes.

The objective of the Strategy will be to identify where existing mechanisms for improving air quality are likely to fall short of meeting the air quality standards it proposes, and to find additional measures to bridge the gap. Those existing measures include: the control of emissions from domestic premises through successive Clean Air Acts and nuisance provisions of the *Environmental Protection Act 1990* (EPA); the regime of integrated pollution control (IPC) of industry, which regulates emissions under the EPA; and the comprehensive EC package of measures to reduce vehicle emissions at source.

However, additional measures achievable under the Clean Air Acts (now integrated into the *Clean Air Act 1993*) and EPA are likely to be very limited, as both of these sets of controls are essentially working at their optimum levels. Most significant industrial pollution is covered by the EPA, and few homes and trade businesses burn coal or fuels which could give rise to the dark or black smoke which the *Clean Air Act* aims to prevent.

The package is supplemented by a framework of international treaties which the Strategy says "cover most of the transboundary pollutants that affect the UK", for example in controlling the pollutants which contribute to acid rain.

The National Air Quality Strategy will be founded on a number of principles, including that of the "polluter pays", i.e. that the environmental costs of pollution should be reflected in the

⁴⁹ Department of the Environment Press Notice 356 *New Air Quality Strategy Promises End to Smog Episode - UK takes lead on air quality management* 21 August 1996.

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costs of goods, services or activities which create it. There is a risk assessment approach to setting objectives (based upon recognised scientific evidence) and the "precautionary principle", which states that the Government will be prepared to take action even if there is inconclusive scientific knowledge, providing the "balance of likely costs and benefits justifies it" and where there are "potentially significant risks of damage to the environment".

C. Approach of the Strategy

The draft Strategy is based on three elements:

- (i) Air quality standards
- (ii) A framework of policy objectives
- (iii) Specific targets, setting out when and how given standards should be achieved.

The draft Strategy consists of two parts. Part I includes information on the international and European framework within which it will operate and the new national air quality standards and objectives. It identifies how far current policies will achieve the targets, and highlights the remaining areas to be tackled. The Strategy has a multi-sectoral approach, incorporating programmes for business and industry, transport, and action on a local level by individuals and local authorities. Part II of the Strategy identifies, on a pollutant-by-pollutant basis, the steps which it considers will be necessary to meet the objectives.

D. Air Quality Objectives

The Government has made a distinction in the draft Strategy between the air quality standards recommended by EPAQS, and the possibility of achieving these standards in practice. Instead of setting a target of meeting the EPAQS standards in full for all of the pollutants, the Government has attached short periods to EPAQS's recommendations, when air quality standards can be exceeded, making them new air quality *objectives*.

The pollutants which have objectives that differ from EPAQS's recommended air quality standards are NO₂, SO₂, ozone and PM₁₀. The objectives are set in terms of "percentiles". The way in which these work is by considering the percentage of time that levels of pollution meet (or conversely, exceed) the air quality standard for each pollutant. Therefore, in the case of nitrogen dioxide (with a 99.9th percentile and a standard of an hourly average of 104.6

ppb), levels of NO₂ must not be more than 104.6 ppb for 99.9% of the hours in the year, i.e. it can exceed the standard for 87.6 hours per year (0.01% of the time). The same principle applies to the other pollutants with the respective percentiles applied to them. The standards and objectives of the Strategy are shown in Table 1.

Table 1 National Air Quality Strategy Air Quality Standards and Objectives for the UK

Pollutant	Standard	Objective
Benzene	5 ppb running annual mean	5 ppb to be achieved by 2005
1,3-Butadiene	1 ppb running annual mean	1 ppb to be achieved by 2005
Carbon monoxide	10 ppm running 8-hr mean	10 ppm to be achieved by 2005
Lead	0.5 µg/m ³ annual mean	0.5 µg/m ³ to be achieved by 2005
Nitrogen dioxide	104.6 ppb 1-hr mean	104.6 ppb, measured as the 99.9th percentile, to be achieved by 2005
Ozone	50 ppb 8-hr running mean	50 ppb, measured as the 97th percentile, to be achieved by 2005
Particles (PM ₁₀)	50 µg/m ³ 24-hr running mean	50 µg/m ³ , measured as the 99th percentile, to be achieved by 2005
Sulphur dioxide	100 ppb 15-min mean	100 ppb measured as the 99.9th percentile, to be achieved by 2005.

Note: A running mean is an average over a changing, rather than a fixed, period. Thus a 24-hour running mean is the average concentration of pollution over the preceding 24 hours at *any* given period in the day.

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The objectives for the last four pollutants are provisional, on the basis that they are more likely to be changed as a result of modification of the Strategy than the others. The new EPAQS standard for NO₂ of 150 ppb as an hourly average is likely to be adopted in the final draft, as the Government has stated that the Strategy will use the EPAQS standards where they exist. However, no information is available as to what the objective for NO₂ will be. All the objectives will be reviewed as part of the overall review of the Strategy in 1999.

Whilst the air quality standards will have no legal force, the objectives will be mandatory, and the Government has issued draft Regulations⁵⁰ for consultation under section 87 of the *Environment Act*. It is intended that the Regulations, which will be known as the *Air Quality Regulations 1997*, will come into force on 1st April 1997.

The Government has recognised that daughter directives produced under the new EC framework directive will supersede any national regulations setting air quality standards. The European Commission plans new daughter directives for the pollutants in the Strategy, plus polycyclic aromatic hydrocarbons (PAHs) cadmium, arsenic, nickel and mercury.

The regulations do not include an objective for ozone because the Government believes that local action would not be effective in reducing local levels due to the nature of ozone's formation over large distances and relatively long timescales, and also because it is formed from other pollutants and cannot, therefore, be tackled at source. It addresses this issue in the Strategy⁵¹:

The number of sources of ozone precursors is so great, and their distribution so diffuse and widespread, that only action coordinated on a grand scale will be sufficient to tackle the problem effectively.

The first priority for the UK is to secure a sensible and constructive agreement on emissions reductions across Europe in the new Nitrogen Protocol. In order to ensure that action to combat ozone formation is properly coordinated, the Protocol will probable extend to cover emissions of VOCs, a move which the UK would support.

⁵⁰ Reference 39.

⁵¹ Chapter 2, paras 14-15.

III Implementation

The Government's overall view is that the air quality objectives it has set out in the National Air Quality Strategy can be met by 2005 with the supplementary measures it identifies. The Strategy states that improvements in air quality must be brought about via the sector which can deliver them in the most cost-effective manner, and anticipates that existing means of pollution control, principally at the international level, will deliver most of the improvements required.

A. Meeting the Objectives

For each of the main pollutants, the Strategy identifies the reduction in emissions which, broadly, will be required to achieve air quality objectives. It outlines measures which the Government believes will deliver these, and sets about identifying how the estimated shortfall can be made up.

For some pollutants, such as VOCs, lead and CO, no new action will be implemented because the Government considers that existing mechanisms, such as vehicle standards and a new regime to recover the vapour from VOCs at refineries and petrol stations, will ensure that the targets are met. For the remaining pollutants, a package of measures will be required. A summary of the principle mechanisms which the Government anticipates are needed to deliver air quality objectives is shown in Table 2. Measures for dealing with ozone are listed in the Strategy, but have not been included in Table 2 as ozone will not be a statutory air quality objective.

Table 2 Mechanisms for Achieving Air Quality Objectives

pollutant	reduction required by 2005	measures to meet target
NO ₂	55-60% on 1995 levels	<p>55% to be achieved via existing and proposed vehicle emissions and fuel quality standards within the EC, with the addition of the Commission's Auto-Oil programme by 2005</p> <p>5-10% shortfall to be achieved by applying improved technology (BATNEEC) to industrial pollution sources and by traffic management by local authorities</p>
PM ₁₀	60% on 1995 levels (for urban areas)	<p>50-55% to be achieved as for NO₂</p> <p>5-10% shortfall to be achieved by applying BATNEEC to industrial pollution sources and by traffic management by local authorities.</p>
SO ₂	Data being researched	<p>UK already committed to reducing emissions by 70% on 1980 levels by 2005</p> <p>Reductions needed in sulphur content of domestic coal and improvements via BATNEEC in industry. Further consideration to be given to extra measures when Sulphur Strategy is reviewed in 1998</p>
Benzene	Not identified	Objective will be met by existing and proposed vehicle standards and new regime vapour recovery for VOCs
1,3 Butadiene	Not identified	Objective will be met by existing and proposed vehicle standards and new regime vapour recovery for VOCs
CO	Not identified	Objective will be met by existing and proposed vehicle standards and new regime vapour recovery for VOCs

As much of the pollutant load is due to road transport and industry, the Strategy identifies some common measures which will help deliver air quality objectives for a number of pollutants. The general commitments are⁵²:

to press for a cost-effective package of vehicle and fuel standards in negotiation of the European Community's post-2000 standards, in order to secure a significant reduction in emissions;

to provide appropriate guidance to local authorities on their duties under the Environment Act 1995, with regard to traffic management in pollution hotspots;

to reinforce measures to ensure compliance with vehicle emissions limits;

to complete investigations into the potential of alternative fuels, and to encourage the development of those which are shown to provide the opportunity for cost-effective improvements in air quality;

to keep under review the use of fiscal incentives as a means of encouraging environmentally friendly transport choices;

to press for a cost-effective programme for further reductions in nitrogen oxides and ammonia within the context of the Second NO_x Protocol to the UNECE/LRTAP⁵³ Convention; and

to continue to apply the principles of BATNEEC⁵⁴ to industries regulated by the Environment Agencies and local authorities under the Environment [sic] Protection Act 1990 (EPA 90).

One of the key principles in the choice of additional measures is cost-benefit analysis, but it is acknowledged (in the case of NO₂ and PM₁₀) that there may not necessarily always be a cost-effective solution. Overall, costs will be incurred by industry and consumers in meeting the objectives.

Some of the proposals, such as the EC's Auto-Oil programme, a package of vehicle fuel and emissions standards, have been costed. This programme would, for example, reduce NO_x emissions by between 20-40% and particles emission by 30%, by raising the cost of a medium sized petrol car by around 1.5%. However, many of the measures have not been costed. While the Strategy makes a commitment to cost-benefit analysis, this will be difficult in practice, as many of the costs and the economic value of the benefits which would accrue are unknown. The draft Strategy acknowledges that, in calculating the value of such benefits "the uncertainties involved are so great at present that a considerable amount of extra work is still needed to improve our level of confidence"⁵⁵.

⁵² Chapter 4, para 36.

⁵³ Long-Range Transboundary Air Pollution.

⁵⁴ BATNEEC is the principle of using the Best Available Technology Not Entailing Excessive Cost in the control of emissions from regulated premises.

⁵⁵ Chapter 4, Box 4.B.

B. Role of the Business and Industry and Transport Sectors

No specific targets have been attached to any of the sectors individually highlighted in the Strategy. However, Integrated Pollution Control (under the Environment Agencies) and Local Authority Air Pollution Control (LAAPC) will clearly be expected to contribute significantly towards achieving air quality objectives, by ensuring that certain types of industrial processes operate within the emissions limits specified, and that any upgrading work to reduce emissions is implemented properly. The basic regime of industrial pollution control in the UK will be altered slightly by the adoption of a new EU Directive on Integrated Pollution Prevention and Control, mainly by including more sectors of business in LAAPC, but the concepts of will not change.

Business will also be asked to sign up to voluntary actions in areas such as transport and energy consumption and environmental accreditation schemes such as EMAS⁵⁶ and BS 7750⁵⁷. Activities such as providing free emissions checks for cars, or promoting car sharing are suggested. The Strategy also highlights the role which innovation, and in particular, environmental technology could play. Energy efficient technologies such as Combined Heat and Power and alternative fuels are recommended for investigation by businesses and industry.

A separate chapter of the draft National Air Quality Strategy is devoted to Transport. Despite the very clear strategic role which transport policy has to play, few specific measures are identified for transport as an economic sector. The chapter restates the part which improved fuel and emissions standards will play and highlights the contribution which will be expected of vehicle maintenance and traffic management, both of which will be the subject of action at the local level. The Strategy does, however, make a commitment to consider further planning advice on links between transport and development planning, and identifies three commitments to aircraft and rail transport. These are:

- (i) to seek further reductions in NO_x emissions from aircraft through the International Civil Aviation Organisation (ICAO). The ICAO agreed a 20% tightening of the NO_x standard in 1993, and a further 16% strengthening of the standard is being recommended;
- (ii) further participation of the Government in international discussions on emissions standards;
- (iii) providing electricity to stationary diesel engines in railway stations to reduce the need for them to idle, and to maintain them effectively in order to reduce emissions.

⁵⁶ Eco-Management and Audit Scheme.

⁵⁷ EMAS and BS 7750 are effectively being superseded by ISO 14000.

C. Action at a Local Level

The Strategy is keen to emphasise that there will be times when international and national strategies will not have the desired impact on local air quality. This will result in local "pollution hot spots" which will need to be tackled at a local level by measures such as traffic management - issues for local authorities. It therefore sets out a new regime of local air quality management, reinforced by the provisions of the *Environment Act 1995*. These are described in detail in the next chapter.

In addition, the Strategy briefly summarises commitments which are desired of individuals, most of which are options already open to car drivers, and it points out education on environmental issues is provided for in Science and Geography lessons in schools, which individual schools are free to build upon. The Strategy states that the Government intends to consult on the "scope for developing further teaching materials on air quality".

IV Local Air Quality Management

A. Air Quality Reviews and Assessments

The new local air quality management regime under the National Air Quality Strategy is essentially a three stage process to identify areas within a local authority's area where air quality objectives are not likely to be met by the year 2005. The three stages of the process are:

1. An initial review, to act as a screening exercise, in order to identify areas where air quality standards or objectives are, or could be, exceeded;
2. Further investigation of air quality, as indicated by the initial review, to confirm or disprove the existence of, or potential for, breaches in air quality standards;
3. A detailed, third stage assessment to determine whether exceedances of the standards are likely to result in air quality objectives not being met. Where this is the case it will trigger the designation of air quality management areas (AQMAs) and production of an action plan of measures to secure compliance.

1. Initial Air Quality Review

Section 82 of the *Environment Act 1995* places a duty on district councils and unitary authorities in England and all local authorities in Wales and Scotland to carry out a review of air quality in their area from time to time. The review must include an assessment of whether air quality standards or objectives in the local authority's area are currently being met, or are likely to be met by 2005. The DoE has issued general principles of guidance for local authorities carrying out the reviews and assessments⁵⁸. This guidance highlights the basic steps which local authorities will be expected to follow, and the framework of principles within which they will operate. The initial review of air quality which local authorities will have to undertake will require them to identify:

⁵⁸ Department of the Environment/Welsh Office/Scottish Office *General Principles of Reviewing and Assessing Air Quality* November 1996.

those roads which exceed prescribed levels of use or congestion;

the existence of certain Part A processes⁵⁹ which have the potential to emit significant quantities of the pollutant concerned;

the existence of certain Part B processes with a potential to emit the pollutants of concern;

other significant sources; and

future planned development which is likely to affect air quality.

If none of these significant sources exist and there is no likelihood of them existing within the time period of the Strategy, the local authority can assume that there is little chance of the air quality standard being breached and no further action will be required.

2. Second Stage Assessment

Where it appears, however, as a result of the initial review, that standards or objectives are either not being met or are not likely to do so, the local authority must identify the areas which it thinks are affected in this way and carry out a more detailed assessment of air quality in the given areas. This second stage assessment will involve estimating maximum pollution levels at ground level at the roadside and industrial and urban background concentrations. The assessment may require further monitoring of air quality in the identified area, or the use of simple air quality models or monitoring data from other sources to estimate the potential for failure to meet air quality standards. The DoE's principles on the review and assessment process states that:

The approach is intended to be precautionary. If there is no significant risk that an objective will not be achieved, a local authority can be confident that an AQMA will not be necessary. If, by 2005, it is likely that the standard will be approached or exceeded, a local authority should proceed to the third stage.

⁵⁹ Part A processes are those whose emissions are regulated by the Environment Agencies under the *Environmental Protection Act 1990*. These tend to include large industrial processes such as power stations and chemical plant. Part B processes are those regulated by local authorities, and include smaller plant such as crematoria, hospital waste incinerators and vehicle sprayers.

3. Third Stage Assessment

The third stage of the process is a further, detailed assessment in order to determine whether measured or predicted breaches of the standards are likely to result in a failure to meet air quality objectives by 2005. Where this is the case, air quality management areas (AQMAs), will need to be designated.

B. Air Quality Management Areas

Within AQMAs local authorities will have to write action plans stating how they intend to go about achieving air quality objectives and explaining the timescale for the implementation of the measures they propose. In areas of England where there is still a two-tier system of local government, the county council has certain rights to consultation in the review and assessment exercise. In practice the DoE expects there to be close liaison between the two tiers at all stages⁶⁰. This is obviously important because county councils, in most cases, will be the highway authority for the area and measures which can be taken to reduce the impact of vehicle emissions on air quality will be important to many authorities, especially in urban areas. The county council is able to make recommendations about both the initial air quality review and the subsequent assessment in the AQMA, as well as on the preparation of action plans. The district council must take the views of the county into account.

Where AQMAs are designated, the county council will be required to have a significant input into drawing up the action plan. The county council must provide the district council, within 9 months, with its proposals for achieving air quality objectives in the designated area, together with a timescale for their implementation. If the county council disagrees with the contents of the action plan, the matter may be referred to the Secretary of State for a decision under section 84(5) of the *Environment Act*.

Clearly, it is the measures set out in action plans which will have the potential to bring about genuine improvements in local air quality. The Government has identified the role of local authorities' planning, pollution control and transport planning functions as the mechanisms for achieving such improvements⁶¹.

⁶⁰ *Air Health Strategy* March 1997 p.4. .

⁶¹ Reference 45.

In December 1996, the Department of the Environment issued for consultation two new circulars on air quality and traffic management⁶² and air quality and land use planning⁶³, specifically to propose ways in which land use and traffic management policy could aid the National Air Quality Strategy.

The consultation paper on land use planning summarises how existing Government planning policy is of relevance to air quality. This includes planning policy and Government guidance which is already available to local authorities, and should therefore already be complied with, including Planning Policy Guidance notes (PPGs) on transport, planning and pollution control, and town centres and retail developments. Whilst the Government states in the paper that it expects local authorities to have regard to national air quality standards when preparing development plans, it does not propose new planning policies in consideration of air quality:

It is not possible... for prescriptive advice on this issue. Whether air quality considerations influence planning decisions will vary from location to location and proposal to proposal and must, in any event, be weighed against other material considerations.

Although changes in planning policy may result in comparatively slow improvements in air quality, as changes take effect, effective traffic management clearly has the potential to make significant contributions to air quality in a relatively short space of time. The traffic management consultation paper recommends a basic approach of reducing congestion as a means of improving emissions levels and fuel efficiency through smoother driving, tempered with a desire to prevent an overall increase in vehicle numbers (in recognition of the fact that less congestion attracts more vehicles onto the roads). The suggested measures to manage traffic and manage restraint are:

encouraging the use of other modes - walking, cycling, public transport;

deterring inappropriate car use by making it more expensive or less convenient;

smoothing traffic flow and regulating traffic speed;

working with businesses and public to increase awareness of the implications of their transport policies and choices.

⁶² Department of the Environment/Welsh Office/Scottish Office *Local Authority Circular on Air Quality and Traffic Management Consultation Paper* December 1996.

⁶³ Department of the Environment/Welsh Office/Scottish Office *Local Authority Circular on Air Quality and Land Use Planning Consultation Paper* December 1996.

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However, in implementing such measures, the draft circular urges local authorities to take a cautious approach:

Where local authorities consider that traffic management can make an appropriate contribution to improving air quality, they should consider and carefully evaluate all the opportunities available to them and set out a balanced and integrated approach tailor made to their specific local circumstances. Local authorities must ensure that the relative contribution of an action plan's objectives are cost-effective and proportionate

The paper further states that measures should be aimed at reducing, where possible, emissions of greenhouse gases such as carbon dioxide, as well as those of the pollutants for which there are standards. This would, by definition, require measures to reduce road transport, as even newer cars with catalytic converters create carbon dioxide, particularly on short journeys, common in towns and cities. The paper suggests that, in practice, action plans will set out a package of measures.

1. New Powers for Local Authorities

Whilst a package of measures to suit local needs provides flexibility of approach, there is a degree of inconsistency between the objectives which local authorities will be expected to deliver, and the powers available to them to do so. The Government has addressed this by issuing a consultation document, seeking a review of the local authority powers which will be required in pursuit of the Strategy, and also by preparing new Regulations under the *Environment Act*. The consultation document puts forward for consideration the extension of LAAPC over small boilers for space heating, and the extension of statutory nuisance provisions to cover emissions of fumes or gases from trade or industrial premises which are not under IPC or LAAPC. The prohibition of "over-the-counter" sales of unauthorised fuels in smoke control areas⁶⁴ is also being consulted upon, as are means of including emissions from vehicles on private land (such as bus depots) as statutory nuisances, although this could presumably be covered by fumes or gases from trade premises, as set out above.

Regulations are currently being prepared under section 87 of the *Environment Act* which will allow vehicles emissions to be tested by trained local authority personnel after being stopped by a police officer⁶⁵. Where the new powers are adopted, roadside checks will be carried out on a random basis and local authority officers will have the power to issue fixed penalty notices to motorists whose vehicles do not comply with current emissions standards. Vehicles

⁶⁴ Sales of unauthorised fuels for delivery in smoke control areas are already illegal.

⁶⁵ Department of Transport press notice 40 *Local Authorities to Enforce Roadside Vehicle Emissions* 8 February 1996.

which fail will need to be tested again to show that their emissions are within acceptable limits.

Currently vehicle emissions testing is carried out by the Vehicle Inspectorate, an agency of the Department of Transport (DoT). The new local authority checks will be in addition to these and the testing standards will be exactly the same as those used by the Vehicle Inspectorate. Some local authorities have offered emissions checks on vehicles in the past but had no powers to force drivers to submit to their vehicles to the tests. The new Regulations provide such powers. The DoT established trials for the new "stop and test" powers in February 1996. Launching the trials, the then Road Safety Minister, Steven Norris, said they illustrated the types of measures in the draft Strategy which could target pollution directly at source, where it was most needed. A code of practice is likely to accompany the Regulations, which will set out a framework of principles within which the testing will take place, in order to ensure a consistent approach between authorities.

Regulations are also intended to enable local authorities to require motorists to switch off their engines when idling, for reasons other than traffic conditions. The regulations concerning parked vehicles will take account of the need for engines to be left running in order to power, for example, air conditioning in coaches and refrigeration plant in commercial vehicles.

2. Traffic Regulation and Restriction

Some measures have already been implemented, in order to facilitate the use of traffic management measures to improve air quality. The powers which highways authorities have to make Traffic Regulation Orders (TROs) under the *Road Traffic Regulation Act 1984* have, following doubts over the application of their use, been clarified by the *Environment Act*. TROs can now be used to restrict, regulate, or prohibit traffic or particular types of vehicles in order to pursue air quality objectives. Outside London, such orders can be applied for periods of up to eight hours in any 24, although within the capital they are unrestricted. The 1995 Act also requires authorities to have specific regard to the air quality Strategy in exercising their powers of traffic regulation.

These amendments do not concern the section of the *Road Traffic Regulation Act 1984* which the High Court ruled in December 1995 should not be used to immediately close roads when pollution levels are high⁶⁶. A local pressure group, Greenwich Action to Stop Pollution (GASP), took the London Borough of Greenwich to the High Court in a test case to get busy roads closed. GASP argued that pollution levels there constituted a "likelihood of danger to

⁶⁶ R v Greenwich London Borough Council, ex p Williams; QBD (Macpherson J); 19 Dec 1995.

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the public", grounds which can be used for immediately closing roads under section 14 of the *Road Traffic Regulation Act 1984*. The High Court ruled that the grounds provided for by the Act were not apt to enable a local authority to close a road temporarily because of environmental circumstances such as danger to the public from air pollution caused by traffic. The section only covered circumstances such as a spillage on the road making its use dangerous to the public or where a road across a heath was affected by smoke from a heath fire.

The possibility of implementing traffic restrictions when pollution reaches certain levels has effectively been ruled out by the Government. It considers such an approach confusing and unworkable, although it does suggest that periodic restrictions could be used which follow established or typical patterns of poor air quality, such as tendencies for localised pollution levels to build up in the winter. Traffic Regulation Orders could also be used to implement a system of permits, allowing access to a given area, for example, only to residents or essential vehicles, although the law does not currently allow for permits to be charged for.

Other possible measures which can be implemented by TROs include the use of width or height restrictions to keep large vehicles out of certain areas, which the Government thinks can be beneficial if carefully designed, and if they do not create extra delay in passing through nor divert traffic onto congested roads elsewhere. According to the traffic management consultation paper, the Government believes that lanes dedicated to cars with high occupancy rates encourage car sharing, but that existing lanes should not be converted for use by such vehicles, and where required, new high occupancy vehicle lanes should be built. The Government further believes that pedestrianisation is a positive measure as long as access is made for delivery and vehicles, and that adequate parking or park and ride provision is made. It believes that parking should be controlled primarily by price, and raises the possibility that parking charges could legally differentiate between cars with different numbers of occupants. However, it regards reducing parking spaces as counter productive, as motorists will drive round looking for spaces.

The traffic management consultation paper suggests that traffic flow can be eased primarily through better traffic signal co-ordination and computerised control systems. Its view is that the variable speed limits on the M25 have been effective in smoothing traffic flow, but that reducing maximum speeds is not a particularly effective option. Very low traffic speeds, introduced on road safety grounds "are unlikely to reduce emissions".

The paper also examines measures which can increase the use of public transport, walking or cycling. Some measures suggested could be implemented quite quickly at relatively low cost, such as introducing real-time information on when buses are due at a particular stop and introducing cycle lanes. However, most of the measures suggested will, at the most, contribute towards a change in culture towards public transport, cycling and walking, and would seem unlikely to have any significant immediate or short-term effect.

C. Guidance on Implementing Local Air Quality Management

Guidance on the technical aspects of carrying out the review and assessment exercise and on developing action plans for AQMAs will be issued by the Government to all local authorities. Technical guidance on the review process is currently being tested by approximately 90 local authorities in 14 "first phase" areas. These were selected by the Department of the Environment to represent the wide variety of scenarios in which local air quality management will have to be applied. They are listed in Table 3, below⁶⁷.

Table 3 First-Phase Areas Involved in Testing Local Air Quality Management Guidance

Greater London	Cambridge
Hampshire	Cornwall
Avon	West Midlands
Derbyshire	Ribble Valley
Merseyside	South Yorkshire
Tyne and Wear	Glasgow
Aberdeen	South Wales

The first phase areas are testing the Government guidance, in order to determine whether the recommended methodologies apply in a range of local circumstances and to develop good practice in implementing the regime. Examples of the tasks being undertaken include those in Hampshire, which, with a large number of oil and chemical industry processes, is involved in a comparison of measured and modelled benzene concentrations across the county, and is compiling an inventory of emissions of VOCs⁶⁸.

The Government had intended that testing of the guidance on carrying out reviews and assessments should be completed by 1 April 1997, so that it could be distributed to local authorities at the start of the process. However, it now seems unlikely that local authorities, who were given the task last autumn, will have completed their work by autumn 1997.

⁶⁷ Reference 60.

⁶⁸ *ibid.*

D. Timetable

The review and assessment process is due to begin on 1st April 1997, although commencement orders for the relevant sections of the *Environment Act* have not yet been made. The air quality reviews are intended to be completed by April 1999, so that any assessments required in designated AQMAs will have to be undertaken within the twelve months thereafter. A review of the Strategy as a whole will also take place in 1999. The first action plans should be produced by 2001, leaving local authorities four years to meet air quality objectives.

The Government does not intend to make compulsory deadlines for completion of the reviews and assessment, and the frequency of these exercises will be at the discretion of the local authority. However, the Government has said that local authorities should carry out at least one further review and assessment by 2005⁶⁹. The *Environment Act* also gives powers to the Secretary of State (or the Scottish Environmental Protection Agency) to undertake the review and assessment process himself in a given local authority area if he chooses, or he may require local authorities to undertake the process themselves if they fail to comply with the procedure.

⁶⁹ Reference 58.

V Will the Strategy Work?

A. General Views

The Government, in a recent press release⁷⁰ stated that it had received over 500 responses to the consultation draft of the Strategy, for which there has been "overwhelming support for the general approach which we have taken. It would seem that we have got the balance about right".

The general response to the draft has been one of credit for the Government for having put forward the Strategy, but doubt as to whether it could be implemented. The journal *ENDS*, commenting on a confidential, pre-consultation draft of the Strategy which it received in June 1996, noted that the "draft is rather more ambitious than many observers expected, although vagueness in several key areas suggests that the DoE was not entirely successful in fending off attempts to water down the strategy"⁷¹. The Strategy was broadly welcomed by the British Government Panel on Sustainable Development, under the leadership of Sir Crispin Tickell, although it had reservations on the effect of the Strategy's reliance on a sustainable transport policy programme⁷²:

The Panel welcomes the target-based approach adopted by the air quality strategy.... Most of the measures required to improve air quality affect transport. The Government's recent Green Paper on transport⁷³ recognises increasing concern about the impacts of transport on the environment and about how far present levels of traffic growth are sustainable. But the measures required to tackle the unsustainable growth in road transport, to improve public transport and to promote greener forms of transport less harmful to the environment are not yet in place. **The Panel considers that stronger measures, both regulatory and fiscal, are required if air quality is to be improved.**

The National Society for Clean Air (NSCA) was also generally encouraged by the publication of the draft Strategy, praising the DoE for having kept to the vision it set out for itself in *Air Quality: Meeting the Challenge*, given the large number of diverging interests in the issue⁷⁴. This followed criticisms by the NSCA that "interdepartmental wrangling" had held up the Strategy, comments taken up by *ENDS* and the *Independent*⁷⁵. The NSCA was specific in its

⁷⁰ Department of the Environment Press Notice 549 *Full Steam Ahead on National Air Quality Strategy - Earl Ferrers* 10 December 1996.

⁷¹ Reference 46.

⁷² British Government Panel on Sustainable Development *Third Report* January 1997.

⁷³ *Transport - The Way Forward* Cm 3234 HMSO 1996.

⁷⁴ NSCA *Clean Air* Vol 26. No.2 27.

⁷⁵ "Motor Pollution is an Issue for Local Will" *Independent* 22 August 1996 p.15.

criticisms, stating that the domestic, commercial and agricultural sectors had been given "an easier ride". It also echoed the concerns raised by the Panel on Sustainable Development over the lack of national fiscal measures to target traffic pollution, commenting that this was due to their unpopularity. The NSCA was reported to have stated that⁷⁶:

"the only credible way to tackle rising vehicle fumes was to increase the costs of motoring by raising road or fuel taxes and diverting the money into public transport and alternatives like cycling to make them more attractive"

The Government argues that it is committed to fiscal measures to tackle pollution, following its 1993 budget commitment to raise road fuel duties by an average of at least 5% in real terms⁷⁷. During the 1996 Budget, the Chancellor of the Exchequer stated that "motorists should bear the full costs of driving - not only wear and tear and congestion on the roads, but the wider environmental costs"⁷⁸. In the same Budget speech, the Government reduced the duty on road fuel gases (compressed natural gas and liquefied petroleum gas) by 25% and the excise duty on lorries meeting 1998 emissions levels by £500 "as an incentive for lorry owners to fit particulate traps or to convert to gas power". However, this approach is criticised⁷⁹ as a half-measure because of the failure to re-invest in public transport the money raised by increasing road fuel duty.

The NSCA also feels that the Strategy relies too much on the benefits which technological developments such as catalytic converters are supposed to deliver, the effectiveness of which has been called into question in recent years, given the large number of short journeys undertaken from cold starts when the "cats" are not working effectively⁸⁰. For different reasons, the reliance on road transport to deliver improved air quality was criticised by the Society of Motor Manufacturers and Traders⁸¹. It said that the costs to the UK automotive industry could not be accurately quantified and complained that the measures "erode the profitability of the industry". Its Director of Public Affairs said "Every time the market picks up, there's another round of requirements, be they safety, or environmental standards", and that the costs would be borne by the industry as they could not be fully recovered from the customer.

⁷⁶ "Gummer Unveils Strategy for Healthier Air by 2005" *The Times* 21 August 1996 p.4.

⁷⁷ HC Deb c.921-41 30 November 1993.

⁷⁸ HC Deb c167 26 November 1996.

⁷⁹ "How Can We Clear the Air" *Independent* 22 August 1996 p.16.

⁸⁰ Reference 76.

⁸¹ "Pollution Strategy may be just Hot Air" *Financial Times* 21 August 1996 p.6.

The question of the application of technology in managing local air quality has also been raised recently in the context of the accuracy of the models used by local authorities to predict air quality⁸². It has been reported that the Government commissioned a study of air pollution models last year, following concerns by councils over their accuracy. The findings of this study are alleged to show that some models are extremely inaccurate.

The *Design Manual for Roads and Bridges*⁸³ (DMRB), produced by the Transport and Road Research Laboratory is one model widely used by local authorities, which is singled out for particular criticism. The *New Scientist* article which quotes the problem believes that the DMRB, which is likely to be used by many local authorities in their air quality reviews, will result in them "approving projects that are likely to breach pollution goals for the year 2005". Professor Bernard Fisher of the University of Greenwich, however, states in the article that the fault is not necessarily that of the manual itself, but of its application. It was designed as a model for rural motorways, not town centre streets, and assumes that car engines are running hot with their catalytic converters working properly, which is often not the case in towns. A group of local authorities is testing air quality models by comparing their predictions to actual measured concentrations of pollution on the ground. It is clear that both better models and clearer guidance for their use will be required if accurate predictions of future air quality are to be made.

Some commentators on the draft Strategy were less encouraged than the NSCA and Sustainable Development Panel at the time of the Strategy's launch, describing it as "a very cautious, bland document...consisting almost entirely of a restatement of existing policies and laws"⁸⁴, a comment echoed by the *British Medical Journal*⁸⁵. These observers complained that the Strategy failed to identify adequately the specific measures needed to fill the gaps between improvements delivered by existing anti-pollution programmes, and the required reduction in emissions needed to meet objectives^{86,87}. Such criticisms may have largely been stemmed by the production of the various consultation documents, discussed in chapter IV.

The NSCA did, however criticise the draft Strategy for being pre-occupied with human health effects rather than environmental effects⁸⁸. The Strategy sets out to be a programme for environmental protection, not just an air quality strategy for safeguarding human health, "we

⁸² "False Forecasts Leave Cities Choking" *New Scientist* 8 February 1997.

⁸³ Department of Transport *Design manual for roads and bridges, Vol. 10* HMSO 1994.

⁸⁴ Reference 79.

⁸⁵ "UK Government Wants to Improve Air Quality" *BMJ* 31 August 1996 p.511.

⁸⁶ *ibid.*

⁸⁷ "British Government Releases Plans to Cut Air Pollution by 2005" *Nature* 29 August 1996 p.743.

⁸⁸ Reference 74.

know that air pollution can degrade both the natural and the man-made environment"⁸⁹, but is not founded on air quality standards which take into account the effects of air pollution on the wider environment. The EPAQS standards are explicitly health-based, even though EPAQS terms of reference include consideration of the effects of pollution on "the wider environment" as well as on human health. Whilst significant improvements in air quality will clearly have a beneficial impact on vegetation and other forms of wildlife, many current air quality guidelines for vegetation are set at a more stringent level than those for the protection for human health. The UNECE and WHO vegetation guidelines for sulphur dioxide, for example recommend annual averages of 7.5 and 12 µg/m³ respectively, whilst the WHO's annual guideline for sulphur dioxide and human health is an annual average of 50 µg/m³. The NSCA sees the review of the Strategy in 2001 as an opportunity to rectify this situation.

B. Standards, Objectives and Timescales

The DoE itself acknowledges that "considerable uncertainties" remain over whether all the targets are achievable⁹⁰, and there is certainly flexibility in the Strategy in terms of provisional objectives. The attachment of percentiles has been perceived by Friends of the Earth (FoE) as a "get-out clause" for the EPAQS recommended standards. FoE also criticised the failure to include ozone among the objectives⁹¹ and the fact that the percentile which the Government has attached to the PM₁₀ standard means that it can be exceeded for a total of four days per year⁹². FoE fears that the standards may be weakened during the review of the Strategy, if the costs of achieving the objectives are too high. The Government has not provided any information on how it calculated the percentiles in response to these criticisms. In the Strategy it justified the translation of standards into objectives:

The Government intends that air quality should be directed towards getting and keeping air quality as close to the standards as is reasonable and justifiable on consideration of the costs and benefits. Therefore the standards will be used as benchmarks or reference points for setting objectives...The air quality objectives in the National Air Quality Strategy represent the Government's present judgement of the balance between the costs to industry, local authorities and the public, and the benefits of achieving very clean air.

The *Guardian*, furthermore, believed that the choice of the end date for the Strategy was "put off until 2005" specifically in order allow the EC directives on fuel and emissions standards to take effect⁹³.

⁸⁹ Chapter 1, para 4.

⁹⁰ Reference 46.

⁹¹ Reference 76.

⁹² "Clean Air Strategy Fails to Tackle Traffic" *New Scientist* 31 August 1996 p.6.

⁹³ "Gummer Passes Buck on Pollution" *Guardian* 22 August 1996 p.7.

C. Funding the Strategy

Concerns about the resources available to fund the implementation of the Strategy have been raised by individual local authorities, the Association of London Government (ALG)⁹⁴ and the Association of Metropolitan Authorities (AMA)⁹⁵. The Sustainable Development Panel commented in its Third Report "It remains to be seen whether the necessary resources will be made available at national and local level for the objectives to be achieved by 2005"⁹⁶. The possibility of the reluctance of the police to assist local authority officers in stopping vehicles for their emissions to be tested without the promise of extra resources from the Government is also raised⁹⁷. The former head of environmental protection at the Department of the Environment was more optimistic that resources would become available for local air quality management⁹⁸.

At the launch of the Strategy, the Secretary of State told local authorities that "we will not see them out of pocket"⁹⁹. The Government has subsequently stated that it has "made resources available for air quality management in this year's Revenue Support Grant, and is also implementing a programme of Supplementary Credit Approvals, of just under £12 million, to support local authorities in modelling and in monitoring air quality over the next three years"¹⁰⁰. Approximately £11 million will be paid to local authorities for the year 1997/98, in order to implement local air quality management. This will equate to around £30,000 per authority¹⁰¹.

Based upon the work undertaken in the fourteen first phase areas, it has been estimated¹⁰² that the initial review process will cost a typical local authority with a mixture of rural and urban areas approximately £6,500, including staffing costs and producing a report. This assumes that all the necessary information is available, and that extra air quality monitoring is not required. However, this estimated figure is increased to between £10,000 and £15,000 for city councils.

⁹⁴ *ibid.*

⁹⁵ Reference 92.

⁹⁶ Reference 72.

⁹⁷ Reference 79.

⁹⁸ *ibid.*

⁹⁹ *ENDS Report* August 1996 pp 29-30.

¹⁰⁰ Reference 70.

¹⁰¹ *ENDS Report* November 1996 p.4.

¹⁰² Ireland, M. *The Economic Implications of Air Quality Management* Presented to the NSCA Annual Conference, Brighton, October 1996.

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The need for further monitoring in a local authority area, or the designation of an AQMA will increase these costs substantially. It is suggested that studies to provide the second and third stage air quality assessments could cost between £10,000 - 20,000. If more than one area within a local authority's boundaries needs a second or third stage assessment, separate studies may be required for each. In the AQMA, modelling and associated techniques may add in excess of £10,000 per AQMA to the bill. Clearly the need to follow the process through to the designation of AQMAs will vary from authority to authority and by no means all councils are likely to have AQMAs at all. However, whilst the sum of £30,000 per authority for the first year of local air quality management may be adequate for most authorities, it is unclear at this stage whether funding will be adequate to carry plans through to the year 2005.

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