



Welsh Air Quality Forum  
Fforwm Ansawdd Awyr Cymru

# Air pollution in Wales

## 2009



A report of  
the Welsh Air  
Quality Forum

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This report has been produced by AEA on behalf of the  
Welsh Assembly Government and Welsh Air Quality Forum

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# Introduction

This is the seventh annual report on air quality in Wales to be produced by AEA, under the auspices of the Welsh Air Quality Forum for the Welsh Assembly Government (WAG) and the people of Wales. It aims to provide Welsh citizens and the air quality community with user-friendly information on local air quality monitoring, pollution levels and their impacts throughout Wales during 2009. It also details the Forum's activities alongside major policy, technical and scientific developments.

Last year a new section on the activities of the Welsh Air Quality Forum was introduced and this is presented in this report in **Chapter 2**. **Chapter 3** reviews the latest legislation and policy developments in air quality in Wales. This year, this section focuses on recent European Directives and, on a more local scale, the Local Air Quality Management Tools that were introduced in 2009. **Chapter 4** summarises the monitoring networks and presents an overview of the data from 2009, including key exceedences, episodes of moderate or high air pollution and data analysis tools available to Local Authorities and researchers. In particular, this chapter includes an analysis of the air quality issues and events surrounding the eruption of the Eyjafjallajökull volcano in Iceland in early 2010.

As in previous reports, **Chapter 5 and 6** are about trends in air pollution in Wales. State of the Environment Indicators, long-term trends and the spatial distribution of air pollutants across the country are reviewed; this year paying particular attention to ground level ozone.

For the past three years **Chapter 7** has been used to report on topics of special interest, and this year it addresses the links between air quality and climate change. This chapter also provides a summary of the latest Welsh Climate Change Strategy and some tips on how individuals in Wales can reduce their carbon footprint.

Finally, for readers wanting to find out more, additional web-based and published sources of information are summarised in **Chapter 8**.

The Welsh Assembly Government and Welsh Air Quality Forum work with air quality experts and the UK Department for Environment, Food and Rural Affairs (Defra), to monitor and reduce air pollution in Wales.

Air quality in Wales continues to improve year on year and both emissions and ambient concentrations of key pollutants are decreasing, though annual average concentrations across the country have started to level out in recent years, as shown in Figure 1.1.

All monitoring data analysed and presented in this report have been provided by the Air Quality Monitoring Database for Wales, which is linked to the public facing website [www.welshairquality.co.uk](http://www.welshairquality.co.uk). The database was established in 1995 and has been managed by AEA since 2003. All data used in this report is freely available through the website, which has been improved and developed over recent years and is now used by 22 Local Authorities to submit monitoring data, and by thousands more individuals to download data, calculate statistics and find out about the monitoring sites and the measurements which take place.

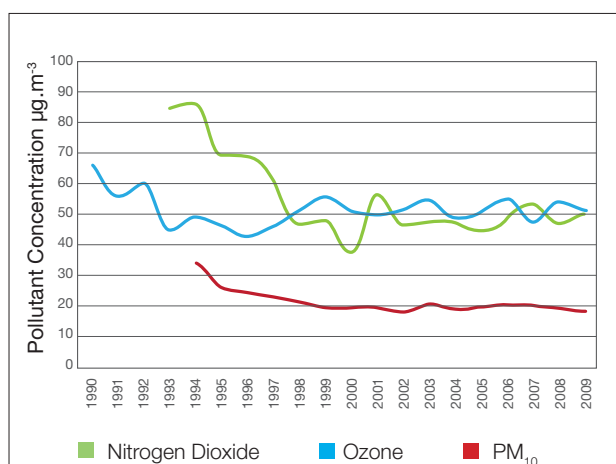


Figure 1.1

Air quality since 1990

# WAQF Activities

## The objectives of the WAQF can be summarised as:

1. Operate, review and improve the Welsh Air Quality Database and website, enabling remote access for LAs and WAG.
2. Ensure quality assurance and quality control of monitoring procedures, sample analysis and assessment.
3. Support existing Geographical Information systems and facilitate automatic data collection from monitoring equipment
4. Provide a forum for Local Authorities and public bodies in Wales, encouraging a coordinated monitoring response across Wales.
5. Assist and advise Local Authorities and hold annual stakeholder seminars.
6. Interpret and disseminate emerging research and identify gaps in air quality monitoring.

The Welsh Air Quality Forum (WAQF) represents the 22 Unitary Councils of Wales and is made up of representatives from Local Authorities, Welsh Assembly Government, Public Health Wales, the Environment Agency and several academic institutions. The WAQF members are responsible for the collection, dissemination and coordination of air quality monitoring information in Wales. This includes the operation of the Welsh Air Quality Database (WAQD), the quality assurance and quality control of all data, and the provision of ongoing support and training to Local Authorities. The WAQF provides expertise and guidance to ensure that Local Air Quality Management (LAQM) statutory requirements are met and air quality in Wales is reported in an accurate, transparent and timely manner.

## Web Discussion Tool

In August 2009 the Welsh Air Quality Forum launched a new online discussion tool for its members. This was developed to allow greater involvement in consultations, discussion and knowledge transfer, with the intention that the discussion areas will facilitate and encourage the sharing of practical experience and good practice throughout the entire community of Welsh Air Quality Managers, regulators and policy developers. There is a structured discussion area that is

used to consolidate and discuss responses to consultations and formal reports and a free discussion area, which provides an informal chat facility. The discussion tool currently has 31 registered users. Recent topics of discussion include:

### General guidance for air quality network managers:

- How to leak check a Beta Attenuation Monitor
- Fire safety recommendations
- Changing NO<sub>2</sub> diffusion tubes during bad weather

### Policy and publications

- Local Air Quality Management Review recommendations
- Consultation on the Air Quality Standards (Wales) Regulations 2010
- Welsh Climate Change Strategy questionnaire
- Independent Review of PM<sub>10</sub> Monitoring at Port Talbot

### Requests for feedback and information

- Topics for the LAQM training day
- Advice on catalytic oxidisers
- Suppliers of mobile Kerbside Monitoring equipment

## Annual WAQF Seminar

The 2009 Seminar of the Welsh Air Quality Forum was held on Wednesday September 23rd with a focus on Air Quality links to Climate Change and Biomass Burning. Presentations were given by the Welsh Assembly Government, the Met Office, and Local Authority perspectives were provided by Swansea City Council and Flintshire County Council.

## Eyjafjallajökull

During the eruption of the Eyjafjallajökull volcano in Iceland in April 2010, local scale monitoring carried out by the WAQF provided invaluable information to monitor and protect the health of citizens across Wales. The Welsh Assembly Government's Emergency Centre used real time measurements of ground level pollutants from the Welsh Air Quality Database, to monitor the potential environmental impacts of the event.



# Legislation and Policy

## Air Quality Standards (Wales) Regulations 2010

The Air Quality Standards (Wales) Regulations came into force in June 2010. These Regulations transpose Directive 2008/50/EC on ambient air quality and cleaner air for Europe (the CAFE Directive) and Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic hydrocarbons in ambient air (the Fourth Daughter Directive) into national law in Wales. The CAFE Directive consolidates and repeals previous ambient air quality legislation - The Air Quality Framework Directive, the Council Decision on Reciprocal Exchange of Information and the First, Second and Third Air Quality Daughter Directives. The Welsh Assembly Government ran a public consultation on the draft Regulations from 11 December 2009 to 5 March 2010. Consultees were invited to review and provide feedback, and comments were received and taken into account. The

Air Quality Standards (Wales) Regulations 2010 will now sit alongside the Air Quality Standards Regulations 2010 for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, PM<sub>10</sub>, PM<sub>2.5</sub>, lead, benzene, ozone, carbon monoxide, arsenic, cadmium, mercury, nickel, benzo(a)pyrene and other polycyclic aromatic hydrocarbons.

The Regulations lay out acceptable methodology and requirements for the assessment of ambient air quality, including the location of and number of sampling points. They identify the duties of Welsh Ministers in relation to achieving target and limit values, long term objectives for ozone, and the responsibility of the WAG to inform the public about air quality in Wales, particularly with regard to warning the public when information and alert thresholds are reached. The requirements for Air Quality Action planning, and the part that plans should play in meeting target and limit values, are also set out in the Air Quality Standards (Wales) Regulations 2010.

## Limit and Target Values

Pollutant	Averaging period	Limit Value (Target Value for Ozone)
Sulphur dioxide	One hour	350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a calendar year
	One day	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a calendar year
Nitrogen dioxide	One hour	200 µg/m <sup>3</sup> , not to be exceeded more than 18 times a calendar year
	Calendar year	40 µg/m <sup>3</sup>
Benzene	Calendar year	5 µg/m <sup>3</sup>
Carbon monoxide	Maximum daily eight hour mean	10 mg/m <sup>3</sup>
Lead	Calendar year	0.5 µg/m <sup>3</sup>
PM <sub>10</sub>	One day	50 µg/m <sup>3</sup> , not to be exceeded more than 35 times a calendar year
	Calendar year	40 µg/m <sup>3</sup>
PM <sub>2.5</sub>	Calendar year	25 µg/m <sup>3</sup> *
Ozone (Protection of human health)	Maximum daily eight hour mean	120 µg/m <sup>3</sup> , not to be exceeded on more than 25 days per calendar year averaged over 3 years
Ozone (Protection of vegetation)	May to July	AOT 40 (calculated from 1h values) 18,000 µg/m <sup>3</sup> · h averaged over five years

Table 3.1 EU Limit and Target Values

\* The Limit Value for PM<sub>2.5</sub> has a Margin of Tolerance of 20% on 11 June 2008, decreasing on the 1 January 2009 and every 12 months thereafter by equal annual percentages to reach 0% by 1 January 2015.

Pollutant	Target value for the total content in the PM <sub>10</sub> fraction averaged over a calendar year	Date by which target value should be met
Arsenic	6 ng/m <sup>3</sup>	31 December 2012
Cadmium	5 ng/m <sup>3</sup>	31 December 2012
Nickel	20 ng/m <sup>3</sup>	31 December 2012
Benzo(a) pyrene	1 ng/m <sup>3</sup>	31 December 2012

Table 3.2 Fourth Daughter Directive Target Values

## National exposure reduction for PM<sub>2.5</sub>

Welsh Ministers must ensure that all necessary measures not entailing disproportionate costs are taken to:

- Reduce exposure to PM<sub>2.5</sub> with a view to attaining the national percentage exposure reduction target by 2020
- Ensure that the average exposure indicator for 2015 does not exceed 20 µg/m<sup>3</sup>

## INSPIRE Directive

Directive 2007/2/EC of the European Parliament and of the Council came into force on 14 March 2007, establishing an Infrastructure for Spatial Information in the European Community (INSPIRE). This initiative creates the underlying rules for exchanging data and services across national boundaries in Europe, developing and implementing a Europe-wide infrastructure for spatial information. For air quality in Wales, this will particularly affect the availability and format of measurement data.

The principles of INSPIRE are:

- Data should be collected once only and shared between all levels of government and all stakeholders
- It should be possible to combine spatial data from different sources, for example, weather data, emissions data and ambient concentrations

- It should be easy to discover which spatial data are available, to evaluate if they are fit for purpose and to know what conditions apply for their use.

The Directive includes metadata<sup>1</sup> regulation, data specification regulation, network service regulation, data & service sharing regulation and monitoring & reporting regulation. The Member States are expected to follow these regulations when they are published. The INSPIRE initiative is currently in its final phase, preparing for implementation, but it will be several years before all data are compliant.

## Implementing Provisions

The European Commission is currently preparing a report on Implementing Provisions for reporting under the Directive on Ambient Air Quality and Cleaner Air for Europe. This work also has links to the INSPIRE Directive.

The main elements of Implementing Provisions are:

- Specification of the information to be reported
- Information flow requirements including deadlines and reporting cycles
- Common data format and metadata description
- Description of tools for checking the format, data and metadata consistency and integrity
- Description of rules and tools for merging and aggregating the data.

## New LAQM tools

In 2009 the Welsh Assembly Government issued revised policy guidance on managing air quality to help Local Authorities to fulfil their statutory duties Part IV of the Environment Act 1995. The UK also updated its technical guidance and there is a set of new and revised tools for Local Air Quality Management, available at <http://laqm1.defra.gov.uk/review/tools/index.php>

<sup>1</sup> Metadata is information which describes another item. Metadata for a dataset of PM<sub>10</sub> measurements may include: Site name, Site location, Site Classification (rural, roadside, urban background), Measurement method, Temporal resolution

# Monitoring networks

Several national monitoring networks operate in Wales to meet regulatory requirements and to provide information for air quality researchers, the medical community and members of the public.

Local Authorities also operate automatic monitoring sites, and in 2009 there were a total of 35 such sites distributed throughout the country in urban background, rural and roadside locations. In addition to these there were several hundred sampler based sites for the measurement of NO<sub>2</sub> by diffusion tube.

Eight new automatic analysers were installed at Welsh sites during 2009:

Anglesey Holyhead	SO <sub>2</sub>
Caerphilly, Blackwood High St	NO <sub>2</sub> and PM <sub>10</sub>
Mold	NO <sub>2</sub> and O <sub>3</sub>
Port Talbot, Talbot Road	PM <sub>10</sub>
Port Talbot, Theodore Road	PM <sub>10</sub>
Wrexham	PM <sub>2.5</sub>

Overall data capture for the automatic instruments during the year was 89.3%. Moderate levels of ozone were recorded on 115 days during the year at one or more sites, and PM<sub>10</sub> levels were moderate or high on 47 days.

One example of a period with raised pollution levels was from Wednesday 18th to Sunday 22nd March 2009 when sites across Wales measured levels of PM<sub>10</sub> particulate matter at air pollution index 4 (Moderate) or above. This elevated level of PM<sub>10</sub> was caused by air recirculating over the UK and Northern Europe, as shown in the air mass back trajectory in Figure 4.1. Figure 4.2 presents Openair time series plots showing elevated levels of PM<sub>10</sub> at four sites during that period.

## Volatile Correction Model

The Volatile Correction Model is for operators of PM<sub>10</sub> Tapered Element Oscillating Microbalances (TEOM) to correct measurements for the loss of volatile components

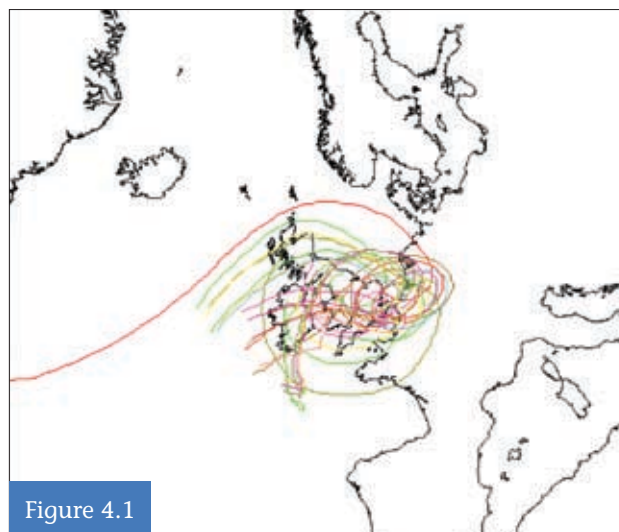


Figure 4.1

Airmass back trajectories for 96 hours up to 12:00 Wednesday 18/03/2009

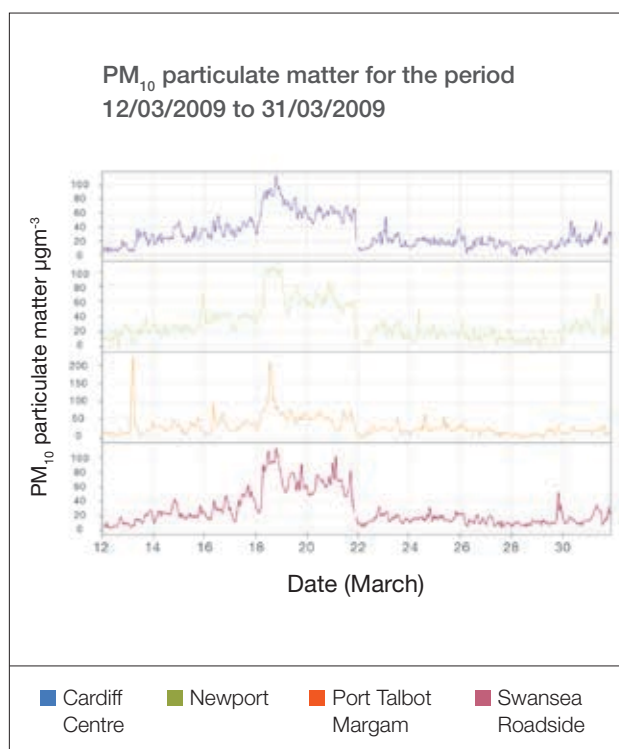


Figure 4.2

Openair time series plot of the March PM<sub>10</sub> episode at four Welsh sites

of particulate matter that occur due to the high sampling temperatures employed by this instrument. The resulting corrected measurements have been demonstrated as equivalent to the gravimetric reference equivalent. The Model uses data from Filter Dynamic Measurement Systems (FDMS) to calculate an appropriate correction based on the location of the instrument and the period of the measurements. Data from 2003 onwards can be corrected. The model was developed in 2007 and has become increasingly popular. In 2009 the air quality TEOM data submitted by the UK to the European Commission was corrected by the Volatile Correction Model. To access the model and for more information, visit [www.volatile-correction-model.info](http://www.volatile-correction-model.info)

## Openair

2009 saw huge developments in the Openair project, funded by the Natural Environment Research Council (NERC), Defra and the Devolved Administrations. Openair is a collection of data analysis and data presentation tools for the air quality community. They have been developed using a powerful programming language called R, and are open source and free. For the majority of people who are not conversant with the R language, including researchers, Local Authorities and the general public, a user-friendly interface has also been developed and will be available on the UK Air Quality Archive in early 2011. In the meantime the tools and a detailed set of instructions can be found at [www.openair-project.org](http://www.openair-project.org)

## Eyjafjallajökull

On March 20 2010, Iceland's Eyjafjallajökull Volcano burst into life for the first time in 190 years, sending a plume of ash and sulphur dioxide into the atmosphere. The main summit eruption of Eyjafjallajökull started at about 10.30 on April 14. The size of the eruption itself was relatively weak, but the initial phase was extremely explosive due to meltwater from the glacier causing the magma to fragment into highly abrasive glass particles which were thrown upwards in a plume to 13 km.

Following advice from the Met Office (the north-west European Volcanic Ash Advisory Centre) UK airspace was closed for six days due to the high risk of damage to aircraft flying through the plume.



Figure 4.3

Images of the ash plume taken during April 2010  
Source: Icelandic Met Office, <http://en.vedur.is/>

From April 14 the volcano continued to erupt intermittently for several days. On April 19 the NOAA HYSPLIT model forecast that the ash plume may be driven at a high altitude over Wales, in certain meteorological conditions this could result in a grounding of the plume and high levels of air pollution at ground level.

The Welsh Assembly Government's Emergency Centre was activated to monitor the threat and experts assessed the changing situation. Throughout the eruption, local monitoring data from the Welsh Air Quality Database provided comprehensive real-time data to monitor the environmental impacts of the ash and sulphur dioxide at ground level, thus providing vital information on the potential health effects for Welsh citizens. Forecasters at AEA and the Met Office provided daily assessments to the Emergency Centre until the volcanic activity ceased.

Earth observation teams from across Europe descended on Iceland to monitor the atmosphere. Measurements taken by airborne instruments showed that the size of the particles



# Air quality trends

In this chapter an update on the State of the Environment in Wales (July 2010) is presented. This update is provided by the WAG and rates progress against a set of key environmental indicators set out in the Environment Strategy for Wales (2006). There is a 'clear improvement' in the following indicators:

- Level of emissions from Wales of sulphur dioxide
- Level of emissions from Wales of nitrogen oxides
- Level of emissions from Wales of fine particulates
- Level of emissions from Wales of Non Methane Volatile Organic Compounds (NMVOC)
- Level of emissions from Wales of carbon monoxide
- Level of emissions from Wales of ammonia
- Area of natural and semi-natural habitat where deposition of acid exceeds critical loads

The following indicators were rated 'stable' or they showed no clear trend:

- Number of days when air pollution is moderate or higher in rural zones and urban agglomerations
- Air concentrations of Heavy Metals
- Area of natural and semi-natural habitat where deposition of nitrogen compounds exceeds critical loads

There was insufficient data to assess the number of people living in Air Quality Management Areas. A more comprehensive update is available at <http://www.statswales.wales.gov.uk/TableViewer/document.aspx?ReportId=5830#hazards>

The graphs below focus on emissions of NO<sub>x</sub> and SO<sub>2</sub> in Wales over the past 20 years. The data has been provided by the National Atmospheric Emissions Inventory (NAEI) for which the latest data available is 2008.

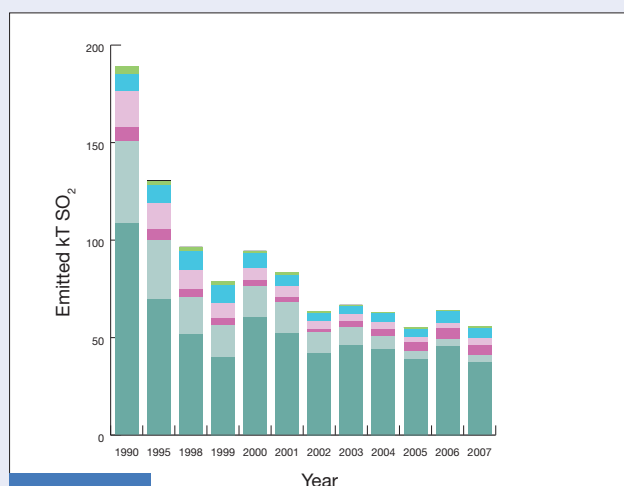


Figure 5.1

Shows the steep decline in SO<sub>2</sub> emissions in Wales, including a 92% reduction in emissions from energy consumption since 1990

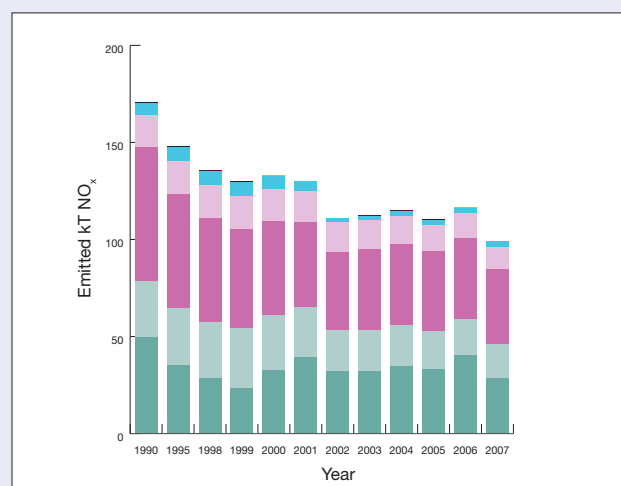


Figure 5.2

Shows a clear improvement in the emissions of NO<sub>x</sub> from the main sectors, by 38% since 1990

**Key**

Energy Consumption	Energy Generation	Transport	Commercial and Residential
Industrial	Gas and Oil	Agriculture	Waste



6

# Maps

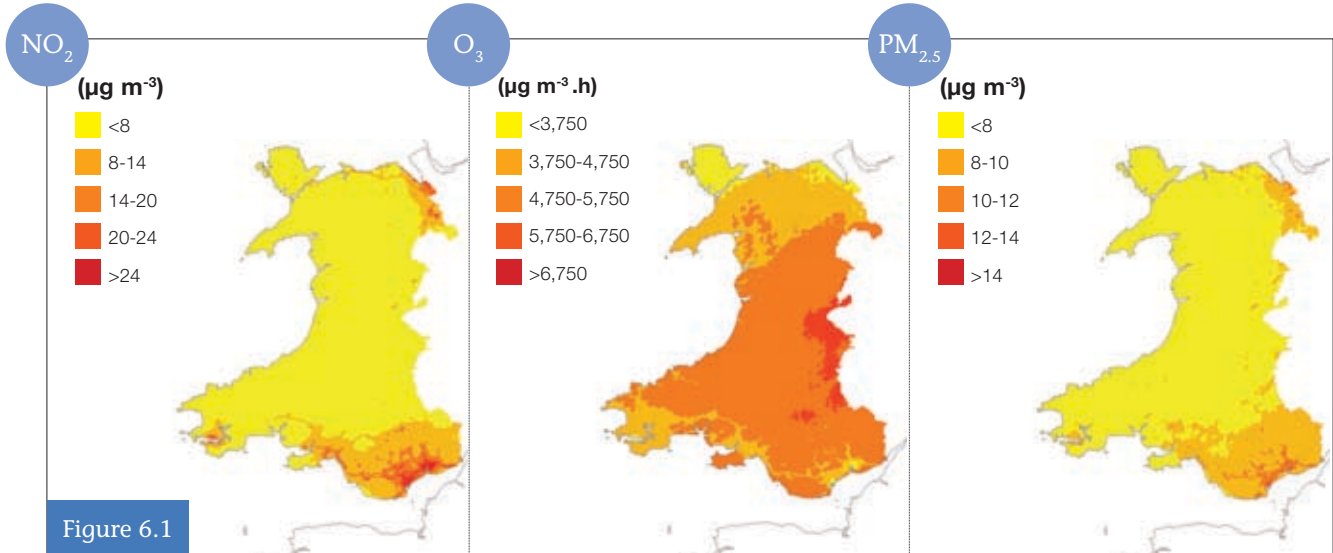


Figure 6.1

Spatial concentration of NO<sub>2</sub>, ozone and PM<sub>2.5</sub> during 2009 Welsh Assembly Government OS license number - 100017916

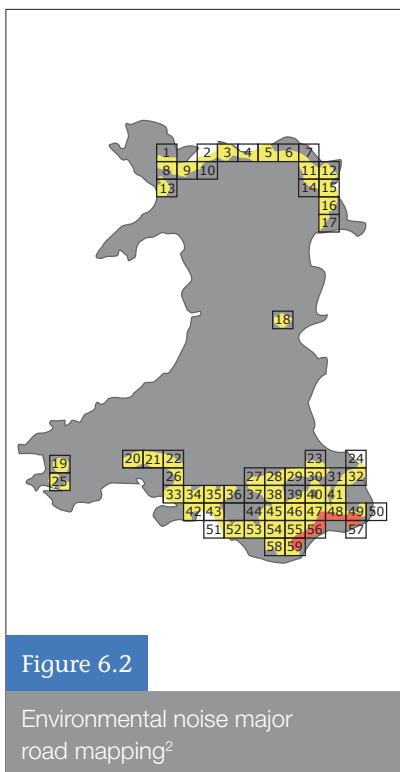


Figure 6.2

Environmental noise major road mapping<sup>2</sup>

Major roads have been mapped in Wales as part of the Environmental Noise Directive, and have been defined as those that have more than 6 million vehicle passages a year. Figures 6.1 and 6.2 show the correlation between high traffic density and elevated PM<sub>10</sub>, PM<sub>2.5</sub> and NO<sub>2</sub>, due to the emissions from road transport and contributions from other associated human activity in these areas, including major industrial and domestic sources.

## Ozone

Ozone is a secondary pollutant created in the atmosphere when sunlight initiates photochemical reactions between volatile organic compounds and nitrogen oxides. Episodes of high ozone concentrations therefore often occur in summer, when solar radiation

is highest. The generation of ozone can take place over large distances and over many hours or days, so emissions in one country can lead to high ozone concentrations in neighbouring countries. Figure 6.1 shows that ozone is generally higher in rural areas than at urban and roadside locations. At urban locations where NO is present, the following reaction takes place, converting the ozone into NO<sub>2</sub> and thus reducing ozone concentrations:



Ozone precursor compounds include nitrogen oxides (NO<sub>x</sub>), methane (CH<sub>4</sub>), non-methane volatile organic compounds (NMVOC) and carbon monoxide (CO). These are commonly emitted by industrial processes, road, air and ship transport, homes and agriculture.

<sup>2</sup> Image source: <http://wales.gov.uk/topics/environmentcountryside/epq/noiseandnuisance/environmentalnoise/noisemonitoringmapping/majormaps/?lang=en>

# Focus on air quality and climate change

In Wales key air pollutants are primarily monitored because of their effect on human health and ecosystems. However, some pollutants can also contribute towards climate change and these impacts have to be taken into account when planning national and local abatement strategies. This chapter describes some of the effects of air pollutants on climate change, identifies the most important greenhouse gases and suggests ways that individuals can reduce their emissions of both air pollutants and greenhouse gases to fight climate change and improve air quality.

## Particulate Matter (PM)

Particulate matter from re-suspended road dust, quarrying, road transport and burning of fossil fuels has a well-known effect on health. Some species in particulate matter are toxic and carcinogenic. Small PM fractions can also penetrate deep into the lungs and exacerbate or cause respiratory and cardiovascular diseases such as asthma. What is less well known is that particulate matter in the air also affects climate change. Some types of particles reflect light and heat energy – or radiation – from the sun and therefore have a cooling effect in the atmosphere. Other particulate species absorb and re-emit radiation which causes a net warming effect. Particulates in the atmosphere also affect the formation of clouds which indirectly affects the amount of radiation entering and escaping from the troposphere.

### Cooling

- **Sulphates** formed from the emissions of sulphur dioxide  $\text{SO}_2$ , from fossil fuel combustion
- **Nitrates** formed by nitrogen oxides emitted by fossil fuel burning
- **Ammonia** ( $\text{NH}_3$ ) from agricultural sources promotes the formation of nitrates and sulphates

### Warming

- **Black carbon (soot)** absorbs heat from the sun

## Greenhouse gases

Light and heat energy from the sun is absorbed by the surface of the Earth during the day, and released again slowly over time. Greenhouse gases in the atmosphere absorb the infrared radiation emitted by the Earth's surface. They then emit this infrared radiation back to the Earth's surface. Heat is trapped in the lower levels of the troposphere and this warming is called the greenhouse effect, which contributes towards long term global climate change.

The direct greenhouse gases have different effectiveness in radiative forcing. The Global Warming Potential (GWP) is a means of providing a simple measure of the relative radiative effects of the emissions of the various gases. The index is defined as the cumulative radiative forcing between the present and a future time horizon caused by a unit mass of gas emitted now, expressed relative to that of  $\text{CO}_2$ . It is necessary to define

Greenhouse Gas	GWP	Main sources	
Water vapour	Not calculated		
Carbon dioxide	1	Combustion of fossil fuels	
Methane	21	Agricultural, waste disposal, leakage from the gas distribution system and coal mining	
Nitrous oxide	310	Agriculture, transport, industrial processes and coal combustion	
Ozone	Not calculated		
F-Gases	HFCs	140-11,700	Refrigeration
	PFCs	6,500-9,200	
	SF6	23,900	

Table 7.1 Greenhouse Gases in order of abundance in the atmosphere

a time horizon because the gases have different lifetimes in the atmosphere. Table 7.1 shows GWPs defined on a 100-year horizon (IPCC, 1996). These are the GWP values required by FCCC/CP/2002/8, consistent with Decision 2/CP.3.

A range of GWP values is shown for HFCs and PFCs because these refer to a number of species, each with its own GWP. By weighting the emission of a gas with its GWP it is possible to estimate the total contribution to global warming of UK greenhouse gas emissions.

## Effects and Action on Climate Change

The United Nation's Intergovernmental Panel on Climate Change (IPCC) has reported that evidence for climate warming is now "unequivocal". Climate change threatens the basic elements of life for everyone - access to water, food production, health and use of the land and environment. If no action is taken to reverse climate change, the effect in Wales will be hotter and drier summers, milder and wetter winters, and increased likelihood of flooding in our coastal areas.

In 2007 the UK Air Quality Expert Group published a report called Air Quality and Climate Change: A UK Perspective. The report identified a number of actions, in addition to abatement, that can be taken to reduce emissions of air quality and climate active pollutants. These include:

- Switching from coal to natural gas for power generation. This will reduce CO<sub>2</sub> emissions for each kilowatt generated and emissions of SO<sub>2</sub> and NO<sub>x</sub> will also be reduced.
- Use of new technologies in road transport, for example hybrid vehicles, hydrogen from natural gas or from renewables, to reduce CO<sub>2</sub> emissions for each kilometre travelled and to reduce emissions of NO<sub>x</sub> and particulate matter.
- Efficiency improvements in domestic appliances and industrial processes, for example through technical developments. This will reduce emissions of both types of pollutant, but efficiency measures sometimes result in increased demand, which must be avoided.

## Wales Climate Change Strategy



Figure 7.1

Climate Change Strategy Consultation document

The Welsh Assembly Government is committed to working with the UK Government, the other devolved administrations, the statutory, voluntary sector and business partners in Wales, and the community to tackle the threat of climate change.

In June 2009 WAG embarked upon a public consultation for their new 'Climate Change Strategy – Programme of Action'. This builds upon the targets and approach outlined in previous documents including 'One Wales: One Planet' (2008) and the 'Climate Change Strategy – High Level Policy Statement' (2009). It contains more than 20 specific proposals to enable Wales and the UK to meet targets set out by the Kyoto Protocol and Climate Change Act 2008. These proposals focus on helping people to make climate-friendly choices, leading by example by building climate change into WAG decisions, and improving energy efficiency in the following areas:

- Transport
- Business
- Residential
- Waste
- Public
- Agriculture and land management

The overall aim of the strategy is to reduce the direct emissions of all greenhouse gases by 3% each year (including electricity consumption but excluding emissions from heavy industry and energy generation). However, many of the actions identified by the Climate Change Commission for Wales and laid out in the strategy documents will have wider benefits for Welsh communities. The creation of a low carbon economy will present business opportunities and create jobs across the country, and there are clear health and monetary savings to be made by individuals and organisations changing their behaviour.

The consultation is now closed and the Climate Change Strategy – Programme of Action will be published at the end of 2010. For more information go to [www.wales.gov.uk/climatechange](http://www.wales.gov.uk/climatechange)

## Reduce your carbon footprint



Your carbon footprint is a measure of the amount of carbon dioxide that is emitted into the atmosphere through your daily activities. Each individual can make small changes to their daily routine, and every little helps. The Welsh Assembly Government is currently running a campaign to reduce the Welsh carbon footprint, and you can find out more, and calculate your own footprint, at [www.walescarbonfootprint.gov.uk](http://www.walescarbonfootprint.gov.uk).

Working to reduce your carbon footprint can have lots of benefits. Not only are you helping to slow down climate change and save the planet, you are also likely to save money and become fitter and healthier by the lifestyle changes that you will make. Read on to find out how...

- Replace standard light bulbs with energy saving ones. They last up to ten times longer and use less electricity
- Install loft insulation to make sure that the energy you pay for is heating your home, not the street outside your house
- Turn down your thermostat and wear a jumper instead. Just 1°C in every Welsh home would save £50million in heating bills
- Set your washing machine to 30°C (modern detergents work well at this temperature) and hang your washing out rather than using the tumble dryer
- Don't buy products and groceries with lots of packaging, and make sure you recycle all glass, paper, cardboard, plastics and aluminium foil
- Try to use less water in the kitchen, bathroom and when watering the garden. Showers are better than baths, and the economy cycles on your washing machine or dishwasher will help too
- Start taking your own bags to the supermarket and if you do have to use a carrier bag then reuse it for your next shopping trip. Last year in Wales we used 447 million plastic shopping bags
- Walk or cycle short distances and use public transport for longer journeys. If that isn't possible, consider car sharing to save money and reduce your carbon footprint
- Reduce the amount of red meat in your diet – livestock farming is a major source of greenhouse gas emissions

Contact your energy supplier to see how they can help you to make these changes without breaking the bank in the short term.

# More information

## The Air Quality in Wales Website



Figure 8.1

The Air Quality Website

The Welsh air quality website at [www.welshairquality.co.uk](http://www.welshairquality.co.uk) is available in both English and Welsh languages and provides information on all aspects of air pollution in Wales. This site is part of a family of web-based air quality websites produced by AEA for the UK, Northern Ireland and Scotland.

The website has been designed to be a user-friendly and interactive resource containing comprehensive information on all aspects of air pollution:

- A colour-coded Google map, showing the overall current pollution situation at sites across Wales
- Latest data from all automatic monitoring sites in Wales, accessible from this map
- Air pollution forecasts for South and North Wales
- Information on latest news, developments and publications
- Detailed information on automatic monitoring sites
- A wide range of background information on air pollution sources, health impacts, monitoring techniques, standards and policy issues
- Access to historic air quality data and statistics – for both automatic and sampler sites - going back to 1986

- Provision to submit data via innovative web forms to the Archive
- Headline air quality indicators, trends and modeled future scenarios
- Links to national and global information resources on air quality
- A password-protected area for members of the Welsh Air Quality Forum
- Overview of the data ratification and verification procedures

## Current and forecast air quality (national and local)

In addition to the Air Quality in Wales website, this information is rapidly available in a user-friendly form from:

- The Air Pollution Information Service on freephone 0800 556677
- The UK Air Quality Archive on [www.airquality.co.uk](http://www.airquality.co.uk)

## Health Effects of Air Pollution

Information on the effects of air pollution and the UK pollution banding system can be found at <http://www.defra.gov.uk/environment/quality/air/airquality/publications/airpoll/index.htm>

## General information on Air Quality

The Welsh Assembly Government Environment and countryside links at <http://wales.gov.uk/topics/environmentcountryside/?lang=en>

- The UK Air Quality Information Archive on [www.airquality.co.uk](http://www.airquality.co.uk)
- The National Atmospheric Emissions Inventory at [www.naei.co.uk](http://www.naei.co.uk)
- The Defra air quality information web resource at <http://www.defra.gov.uk/environment/quality/air/index.htm>
- The Northern Ireland Air Quality website at [www.airqualityni.co.uk](http://www.airqualityni.co.uk)

- The Scottish Air quality website at [www.scottishairquality.co.uk/](http://www.scottishairquality.co.uk/)
- The Pollutant Release and Transfer Register at <http://prtr.defra.gov.uk/>
- The Environment Agency at [www.environment-agency.gov.uk/](http://www.environment-agency.gov.uk/)

## Local Air Quality Issues

For further information on air quality issues in your area, please contact the Environmental Health Department at your local District Council office. Further information on Local Air Quality Management may also be found on:

- The Defra website at <http://aqma.defra.gov.uk/>
- The Local Authority support site at <http://www.defra.gov.uk/environment/quality/air/airquality/local/support/index.htm>



In previous years a data CD has accompanied this annual report. These data are now all available on the Welsh Air Quality Website. To access data follow these simple steps:

- Click Data
- Click Download/Submit data
- Click Download data
- Select parameter group (type of data required)
- Select pollutant species
- Select Local Authority region
- Select statistic type (e.g. daily mean)
- Select date range
- Select specific monitoring site(s)

Then simply provide your email address and the data will be emailed to you within a few seconds.

## Monitoring Sites



Figure 8.2

Monitoring sites