European Air Quality Legislation and Management, including Low Emission Zones
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Air Quality Legislation

The main air quality legislation in Europe are the EU Limit Values (shown right), notably PM2.5 and PM10 (NO2 & SO2 have secondary relevance).

In Europe, only Ireland and Luxembourg meet the PM10 Limit Values and the EU is starting to take legal action for infringement. Concentrations are set by World Health Organisation (WHO) recommendations.

For this WHO needs epidemiological studies. These need monitoring data. This needs equipment available and a perceived problem, or monitoring would not be done. For the metric to change, there needs to be the need to epidemiological studies to back this change up.

Air Quality Management

The EU, member states, regions and cities are all responsible for taking action.

EU

Cleaner fuels, vehicle standards, national emissions limits

National (sometimes regional)

Financial incentives, legal frameworks, aircraft & shipping measures, control on large industrial plants

Local

Supporting public transport, cycling and walking, encouraging or requiring cleaner vehicles (for example LEZs), traffic management (eg speed limits, smoothing congestion charging, traffic bans), good landuse management, controls on coal, oil or wood burning, cleaner construction, energy efficiency measures,

Different measures are appropriate in different areas. Depends on:

- Predominant sources, Control over the sources, Legal framework, Financial capacity & tools, Population / taxation culture, Political realities ...

Low Emission Zones (LEZs)

Low Emission Zones are the most effective measure for many urban areas. They are implemented or planned in over 120 cities in 11 countries in Europe. Also in Japan, Korea and China.

The map from www.lowemissionzones.eu shows the coverage in Europe, as well as further information.

Low Emission Zones (LEZs)

Most have 2 phases – Phase 2 having greater effect

All based on Euro standards, most focused on PM - eg Euro 3(PM), allowing retrofit

Retrofit certifications are per country, based on Euro standards. In some cases with mutual recognition.

An EU-wide retrofit certification would make it simpler, cheaper and more robust for all

Most permanent (except Italy) and based on heavy duty vehicles (except Italy and Germany)

A few examples:

- London – national city
  - Heavy vehicles 2008 Euro 3 (PM); 2012 Euro 4 (PM)
  - Euro 2010 PM3 (PM) - likely to be cancelled
  - Camera enforced, ~200 €/day if not meet standards

- Netherlands – national approach
  - Local schemes under national agreement negotiated with operators
  - Currently heavy duty, vans under discussion
  - Heavy duty until 2010 Euro 2; Euro 3 & 4 require filter after 2010
  - Camera enforced in 2010
  - 40% improvement

- Germany
  - National (& regional) approach
  - National framework with emissions classification, local/regional decision and implementation.
  - All vehicles except motorcycles
  - Class 2: All diesel vehicles Euro 2(PM); petrol Euro 1 or equivalent
  - Class 3: All diesel vehicles Euro 3(PM); petrol Euro 1 or equivalent
  - Class 4: All diesel vehicles Euro 4(PM); petrol Euro 1 or equivalent
  - Class 3 from 2010, Class 4 from 2012
  - Manually enforced with sticker, fines & points on your driving licence
  - Tax incentives and ‘hardship’ exemptions to help compliance

- Italy – regional approach
  - Agreement between north Italian regions, allow LEZs without competition
  - All vehicles, including motorcycles, time limited, and only in winter. Manually enforced
  - Euro 2 for all 4-wheel vehicles, no 2-stroke motorcycles
  - Camera enforced, ~200 €/day if not meet standards

For more information on LEZs see www.lowemissionzones.eu

Low Emission (Planning) Strategies

- Emissions standards on construction & use of new developments through the existing planning system
- Allow tighter standards than ‘general’ LEZs
- Include cleaner construction schemes

Impact of Low Emission Zones (LEZs)

For many cities, LEZs are the most effective tool. They tackle a polluting source (vehicles), while allowing vehicles to access the city where needed.

Actual impacts are now being reported.

Limit values are set as PM10 or PM2.5

However effect on health and of LEZs is greater on diesel particulates.

So diesel particles, PM2.5, health impacts or cost benefit analysis are included in assessments. Economic and other impacts of the LEZs are also often assessed.

Stockholm LEZ:

Since 1998. Heavy duty vehicles under 6 years old.

In 2000 Zone reduced concentrations of PM10 by between 0.5-9%. (location dependent) and would have reached 12% with full enforcement (compliance was 95%, now increased).

PM2.5 emissions were reduced by an estimated 40% (with full enforcement 60%).

London LEZ:

Since February 2008. First phase expected to reduce the area over the 2010 PM10 Limit Values by about 5.8% in 2008.

Feasibility study predicted gain of 5200 years of life, and the avoidance of: 310,800 cases of lower respiratory symptoms, 30,000 cases of respiratory hospitalisation & 231,000 restricted activity days for all phases,

Cost Benefit Analysis £250-670 million benefit, £60-250 of which are outside Greater London.

In the first week 50,000 vehicles over 12 T were observed, 91.5% of which complied. In January it had been 75% and in April it was over 95%.

Berlin LEZ:

Since January 2008. In April 2009 the LEZ reduced emissions of diesel particulates by 24% and Berlin’s PM10 by 8%

Reduced: PM10 exceedances from 28 to 24 per year, diesel particulate concentrations by 14-22%, PM2.5 concentrations by 3% on main roads.

The second phase of the LEZ will have a greater impact.

Netherlands LEZs in 9 cities:

- From January 2007. In summer 2008, the actual air quality improvements were slightly less than predicted, with improvements between 0 - 2 µg/m3.
- Impact limited by gradual enforcement and many exemptions for vehicles where diesel particulate filters were not available.
- Both of these will improve and expect to increase the air quality impact by a factor of 1.5 - 2. The LEZ second phase will also increase the impact.

For more information, please contact Lucy Sadler at the contact details above.