

Air Quality Legislation

The main air quality legislation in Europe are the EU Limit Values (shown right), notably **PM₁₀** and **PM_{2.5}** (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.

The last report asked whether **Black Smoke** should be re-introduced as a metric.

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 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 traffic, 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.

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 - individual city

Heavy vehicles 2008 Euro 3 (PM) ; 2012 Euro 4 (PM)

[heavier vans 2010 Euro 3 (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 ; Euros 2 & 3 require filter

after 2010 Euro 3 ; Euro 3 require filter & must be <8 years

after 2013 Only Euro 4, 5, 6, EEV, gas, hydrogen, E85 allowed in

Manually & camera enforced

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

eg Berlin Class 2 from 1.1.2008, Class 4 from 2010. Freiburg Class 2 from 2010, Class 3 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

E.g: South Tyrol

Euro 2 for all 4-wheel vehicles, no 2-stroke motorcycles

7:00 – 10:00 & 16:00 – 19:00, Monday - Friday, Nov 08-March 09

For more information on LEZs see: WWW.LOWEMISSIONZONES.EU.

Gives information on All LEZs in Europe, together with background information.

Also publishes all dpf certifications within Europe. It is the only place where the German dpf certifications are published!

Run by a Network of cities, regions and ministries that operate or plan LEZ

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 PM_{2.5}.

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

So diesel particulates, PM_{2.5}, health impacts or cost benefit analysis are included in assessments.

Economic and other impacts of the LEZs are also often assessed.

Stockholm LEZ:

Since 1996. Heavy duty vehicles under 6 years old.

In 2000 Zone reduced concentrations of PM_{2.5} by between 0.5-9%, (location dependent) and would have reached 12% with full enforcement

(compliance was 95%, now increased).

PM₁₀ 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: 310,000 cases of lower respiratory symptoms, 30,000 cases of respiratory medication & 231,000 restricted activity days for all phases.

Cost Benefit Analysis £250-670 million benefit, £90-250 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 exceedences from 28 to 24 per year, diesel particulate concentrations by 14-22%, & PM₁₀ concentrations by 3% on main roads.

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

Netherlands LEZ, 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.

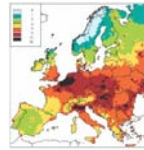
Impact limited by gradual enforcement and many exemptions for vehicles where diesel particulate filters were not available.

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.

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Limit Values for the protection of human health			
Pollutant	Averaging period	Limit value*	Date to be met
Benzene	Calendar year	5 µg/m ³ (1.54 ppb)	1 Jan 2010
Carbon monoxide (CO)	8-hour, rolling basis	10 mg/m ³ (8.6 ppm)	1 Jan 2005
Lead	Calendar year	0.5 µg/m ³	1 Jan 2005 or, in specific cases, 2010
Nitrogen dioxide (NO ₂)	1-hour	200 µg/m ³ (105 ppb), not exceeded > 18 times/ calendar yr	1 Jan 2010
	Calendar year	40 µg/m ³ (21 ppb)	1 Jan 2010
Ozone (O ₃)	Maximum daily 8-hour mean	120 µg/m ³ (60 ppb), not exceeded > 25 days/ calendar yr ave. over 3 yrs	Target value for 2010
PM ₁₀ Gravimetric	24-hour	50 µg/m ³ , not exceeded > 35 times/ calendar yr	1 Jan 2005
	Calendar year	40 µg/m ³	1 Jan 2005
PM _{2.5}	Calendar year	25 µg/m ³	1 Jan 2015
	Calendar year	20 µg/m ³	1 Jan 2020
	Exposure reduction	20% urban background reduction	between 2010 & 2020
Sulphur dioxide (SO ₂)	1-hour	350 µg/m ³ (132ppb), not to be exceeded > 24 times/calendar yr	1 Jan 2005
	24-hour	125 µg/m ³ (47ppb), not exceeded > 3 times/calendar yr	1 Jan 2005
Limit Values for the protection of vegetation (NO _x) and ecosystems (SO ₂)			
NO _x	Calendar year	30 µg/m ³	19 July 2001
SO ₂	Calendar year & winter (1 Oct to 31 Mar)	20 µg/m ³	19 July 2001



Motorway LEZs in Austria and Italy

Austria on 89km of the A12 from Kufstein to Zirl

Trailer lorries >7.5T banned Euro 0 & Euro 1 since 1.1.2007, Euro 2 from 1.11.2008.

Lorries without trailer >7.5T banned for Euro 0 & Euro 1 from 1.11.2009

Also enabled sectoral bans to be legal (EU law)

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

