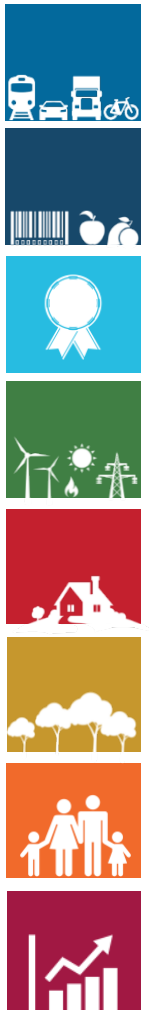




# The Air Convention and emission reductions from mobile sources

Carolin Sanz Noriega, UNECE Convention on Long-range Transboundary Air Pollution



# Key facts

## ENVIRONMENT



- Signed in 1979, entry into force in 1983
- First international treaty to deal with air pollution on a broad regional basis
- 51 Parties in the UNECE region
- Framework Convention with 8 protocols
- Emission reduction targets for several pollutants
- Results:
  - Emission reductions by 40 to 80% since 1990 (sulphur: 70%, nitrogen oxides: 40%)
  - Decoupling of economic growth and air pollution trends
  - **600,000 premature deaths avoided annually**
  - Average life expectancy is today 12 months more than in a hypothetical unabated world.
  - Recovery of forest soils and lakes



# Areas of work

## ENVIRONMENT



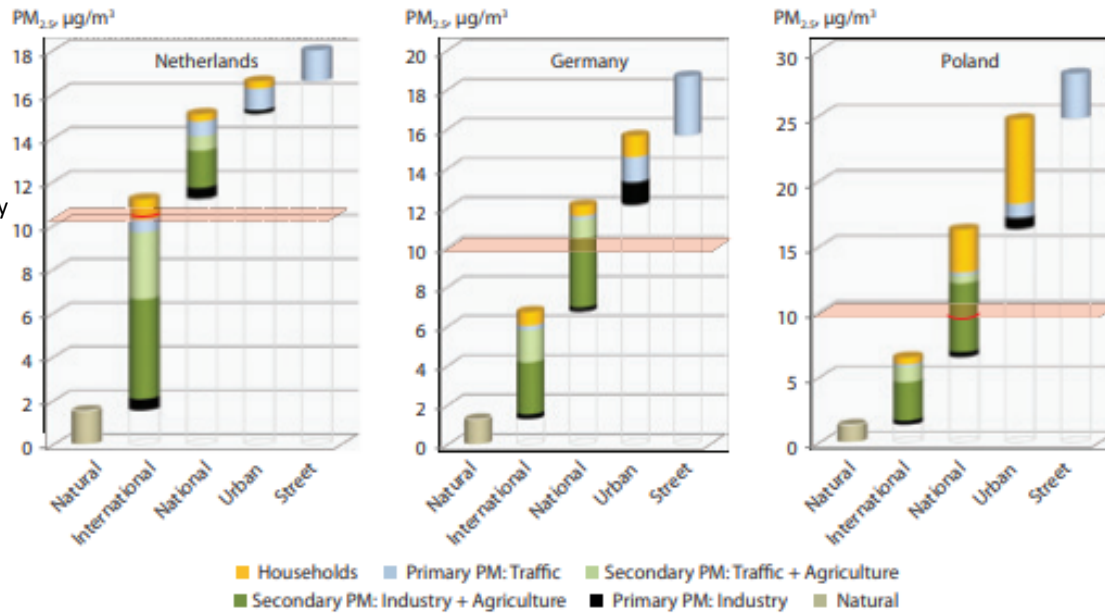
- Policy: international agreement setting emission reduction targets
- Science underpinning policy:
  - The Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) and the Working Group on Effects
- Compliance monitoring
- Capacity-building and awareness raising

# Why? Transport and transboundary pollution at the urban scale



## ENVIRONMENT

WHO air quality guidelines



◀ Comparing the origin of fine particles at street level shows local PM<sub>2.5</sub> concentrations are strongly influenced by secondary particles from transboundary sources. The data are averages based on measurement sites in several cities.<sup>xiii</sup>

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# How? Emission limit values in the Gothenburg Protocol

## ENVIRONMENT

### Annex VIII Limit values for fuels and new mobile sources

**Table 1**  
Limit values for passenger cars and light-duty vehicles

Category	Class, application date <sup>a</sup>	Reference mass (RW) (kg)	Limit values <sup>a</sup>													
			Carbon monoxide L1 (g/km)		Total Hydrocarbons (HC) L2 (g/km)		Non-methane volatile organic compound (NMVOC) L3 (g/km)		Nitrogen oxides L4 (g/km)		Hydrocarbons and nitrogen oxides combined L2 + L4 (g/km)		Particulate matter L5 (g/km)		Number of particles <sup>a</sup> (P) L6 (#/km)	
			Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	Petrol	Diesel
<b>Euro 5</b>																
M <sup>b</sup>	1.1.2014	All	1.0	0.50	0.10	–	0.068	–	0.06	0.18	–	0.23	0.0050	0.0050	–	6.0x10 <sup>11</sup>
N <sub>1</sub> <sup>c</sup>	I, 1.1.2014	RW ≤ 1305	1.0	0.50	0.10	–	0.068	–	0.06	0.18	–	0.23	0.0050	0.0050	–	6.0x10 <sup>11</sup>
	II, 1.1.2014	1305 < RW ≤ 1760	1.81	0.63	0.13	–	0.090	–	0.075	0.235	–	0.295	0.0050	0.0050	–	6.0x10 <sup>11</sup>
	III, 1.1.2014	1760 < RW	2.27	0.74	0.16	–	0.108	–	0.082	0.28	–	0.35	0.0050	0.0050	–	6.0x10 <sup>11</sup>
N <sub>2</sub>	1.1.2014		2.27	0.74	0.16	–	0.108	–	0.082	0.28	–	0.35	0.0050	0.0050	–	6.0x10 <sup>11</sup>
<b>Euro 6</b>																
M <sup>b</sup>	1.9.2015	All	1.0	0.50	0.10	–	0.068	–	0.06	0.08	–	0.17	0.0045	0.0045	6.0x10 <sup>11</sup>	6.0x10 <sup>11</sup>
N <sub>1</sub> <sup>c</sup>	I, 1.9.2015	RW ≤ 1305	1.0	0.50	0.10	–	0.068	–	0.06	0.08	–	0.17	0.0045	0.0045	6.0x10 <sup>11</sup>	6.0x10 <sup>11</sup>
	II, 1.9.2016	1305 < RW ≤ 1760	1.81	0.63	0.13	–	0.090	–	0.075	0.105	–	0.195	0.0045	0.0045	6.0x10 <sup>11</sup>	6.0x10 <sup>11</sup>
	III, 1.9.2016	1760 < RW	2.27	0.74	0.16	–	0.108	–	0.082	0.125	–	0.215	0.0045	0.0045	6.0x10 <sup>11</sup>	6.0x10 <sup>11</sup>
N <sub>2</sub>	1.9.2016		2.27	0.74	0.16	–	0.108	–	0.082	0.125	–	0.215	0.0045	0.0045	6.0x10 <sup>11</sup>	6.0x10 <sup>11</sup>

<sup>a</sup> The registration, sale and entry into service of new vehicles that fail to comply with the respective limit values shall be refused as from the dates given in the column.  
<sup>b</sup> Test cycle specified by NEDC.  
<sup>c</sup> Except vehicles whose maximum mass exceeds 2,500 kg.  
<sup>d</sup> And those category M vehicles specified in note b.

**Table 2**  
Limit values for heavy-duty vehicles steady-state cycle load-response tests

	Application date	Carbon monoxide (g/kWh)	Hydrocarbons (g/kWh)	Total hydrocarbons (g/kWh)	Nitrogen oxides (g/kWh)	Particulate matter (g/kWh)	Smoke (m <sup>3</sup> )
B2 ("EURO V") <sup>a</sup>	1.10.2009	1.5	0.46	–	2.0	0.02	0.5
"EURO VI" <sup>b</sup>	31.12.2013	1.5	–	0.13	0.40	0.010	–

<sup>a</sup> Test cycle specified by the European steady-state cycle (ESC) and the European load-response (ELR) tests.  
<sup>b</sup> Test cycle specified by the world heavy duty steady state cycle (WHSC).

**Table 3**  
Limit values for heavy-duty vehicles – transient cycle tests

	Application date	Carbon monoxide (g/kWh)	Total hydrocarbons (g/kWh)	Non-methane hydrocarbons (g/kWh)	Methane <sup>a</sup> (g/kWh)	Nitrogen oxides (g/kWh)	Particulates (g/kWh) <sup>b</sup>
B2 "EURO V" <sup>c</sup>	1.10.2009	4.0	–	0.55	1.1	2.0	0.030
"EURO VI" (CI) <sup>d</sup>	31.12.2013	4.0	0.160	–	–	0.46	0.010
"EURO VI" (PI) <sup>e</sup>	31.12.2013	4.0	–	0.160	0.50	0.46	0.010

Note: PI = Positive Ignition, CI = Compression Ignition.  
<sup>a</sup> The registration, sale and entry into service of new vehicles that fail to comply with the respective limit values shall be refused as from the dates given in the column.  
<sup>b</sup> For natural gas engines only.  
<sup>c</sup> Not applicable to gas-fuelled engines at stage B2.  
<sup>d</sup> Test cycle specified by the European transient cycle (ETC) test.  
<sup>e</sup> Test cycle specified by the world heavy duty transient cycle (WHTC).

**Table 4**  
Limit values for diesel engines for non-road mobile machines, agricultural and forestry tractors (stage IIIB)

Net power (P) (kW)	Application date	Carbon monoxide (g/kWh)	Hydrocarbons (g/kWh)	Nitrogen oxides (g/kWh)	Particulate matter (g/kWh)
130 ≤ P ≤ 560	31.12.2010	3.5	0.19	2.0	0.025
75 ≤ P < 130	31.12.2011	5.0	0.19	3.3	0.025
56 ≤ P < 75	31.12.2011	5.0	0.19	3.3	0.025
37 ≤ P < 56	31.12.2012	5.0	4.7 <sup>a</sup>	4.7 <sup>a</sup>	0.025

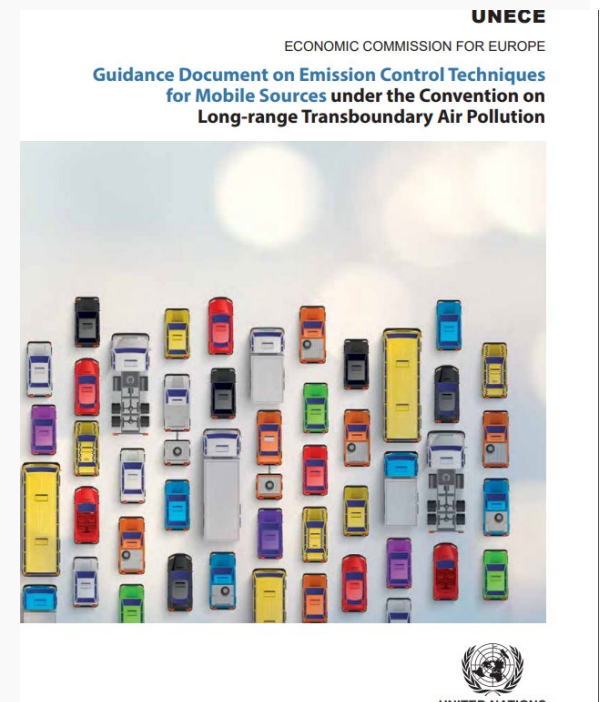
<sup>a</sup> With effect from the given date and with the exception of machinery and engines intended for export to countries that are not parties to the present Protocol, Parties shall permit the registration, where applicable and the placing on the market of new engines, whether or not installed in machinery, only if they meet the respective limit values set out in the table.  
<sup>b</sup> Editor's note: This figure represents the sum of hydrocarbons and nitrogen oxides and was reflected in the final approved text by a single figure in a merged cell in the table. As this text does not include tables with dividing lines, the figure is repeated in each column for clarity.

# Guidance Document on Emission Control Techniques for Mobile Sources



## Main categories of mobile sources considered

	<i>Spark-ignition engines</i>	<i>Compression ignition engines</i>
Road vehicles	<p>Mopeds and motorcycles</p> <p>Light duty vehicles (passenger cars, light commercial vehicles)</p>	<p>Light duty vehicles (passenger cars, light commercial vehicles)</p> <p>Heavy duty vehicles (trucks, buses)</p>
Non-road mobile machinery (NRMM)	Handheld and non-handheld equipment (household, gardening, agricultural and forestry machinery)	<p>Industrial, construction, agricultural and forestry machinery/tractors</p> <p>Railcars, locomotives</p>
Inland waterways	—	Compression ignition engines (passenger ships, freight vessels)





- Exchange of experiences on strategies, policies and measures
- Emission Limit Values and guidance documents
- Batumi Action for Cleaner Air initiative
- Outreach and cooperation across scales: local, national, regional, global
- SDGs:



# Capacity building

## ENVIRONMENT



**Activities:** Roundtable discussions on national legislation analyses and workshops on the development of national emission inventories

**Results:** Progress in emissions reporting and improved quality and completeness of reporting



# Priorities ahead

## ENVIRONMENT



- Air pollution has been recognized as a problem at the global level
- Remaining pollution issues: ground-level ozone, particulate matter
- Cooperation across the scales needed – local, national, regional, global
- Cooperation with organizations and networks beyond the UNECE region
- Lessons learnt from the Convention to contribute to solutions around the globe





# Thank you!

<http://www.unece.org/env/lrtap/welcome.html>

#cleanair40Years

