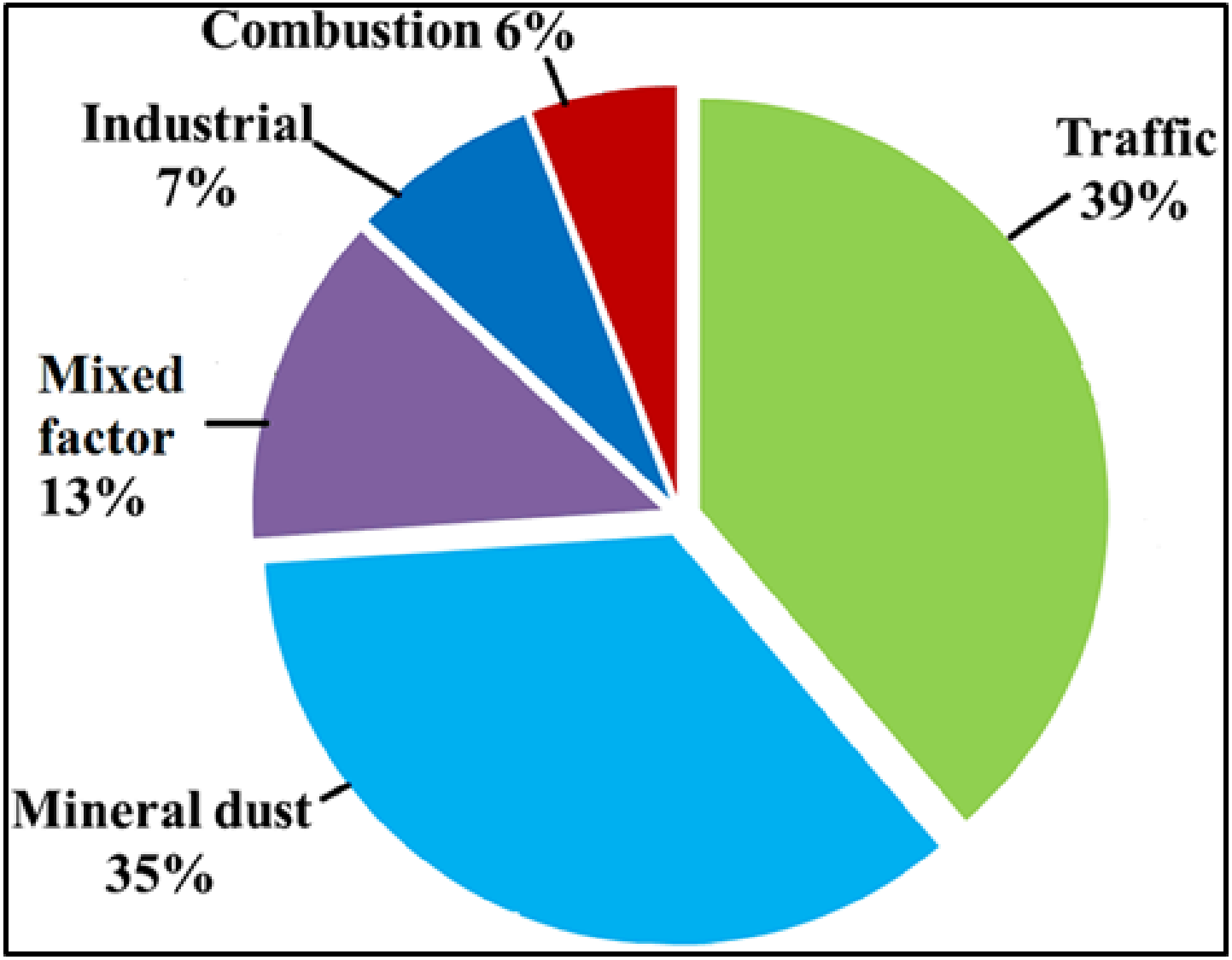
Global Trend Towards Cleaner Fuels

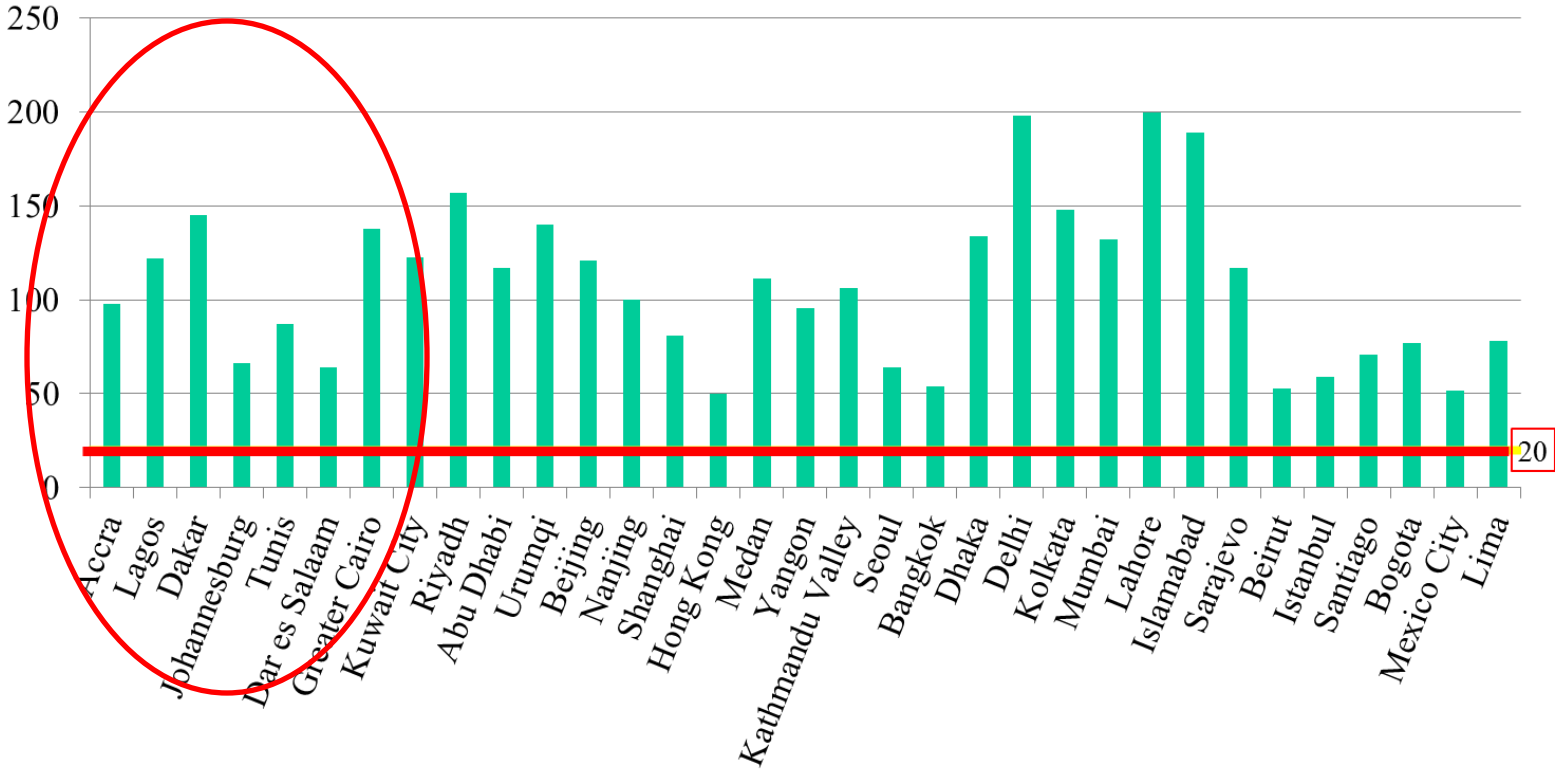
Jane Akumu – UN Environment

Transport is main source of PM in cities

Main Sources of PM in Nairobi



Annual average PM levels of African cities are well above WHO Guideline



WHO, 2012

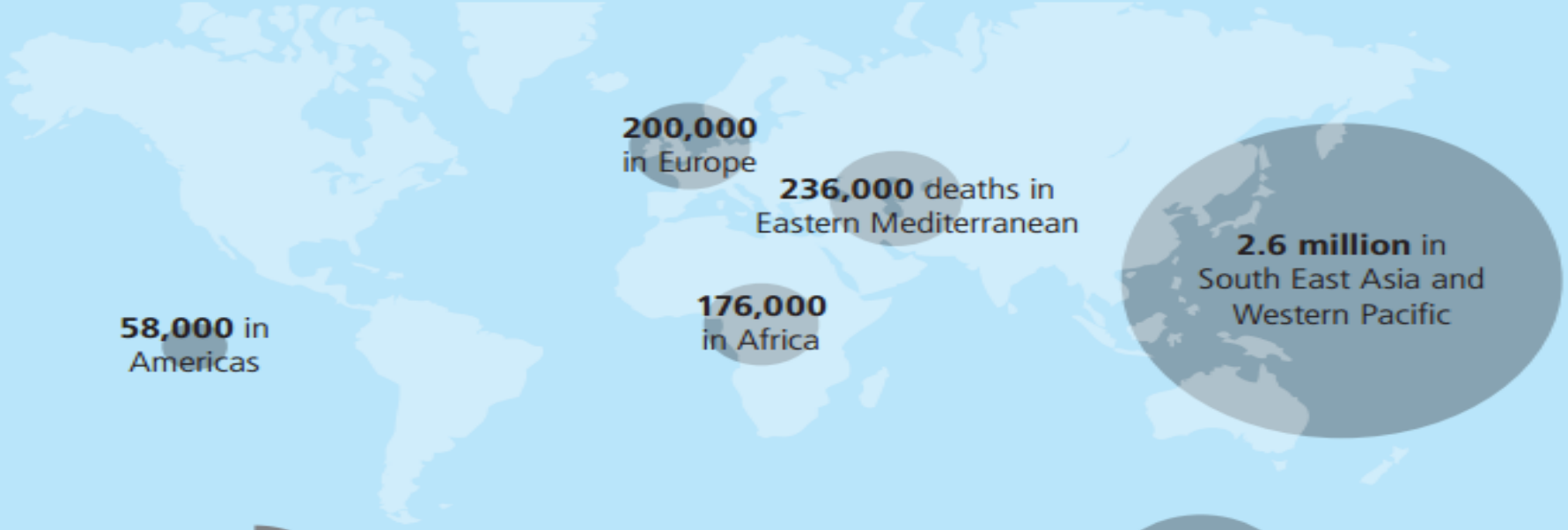
= 20ug/m3 WHO PM10 Annual Air Quality Guideline

The Challenge

Urban buses account for 25% of BC emissions from all passenger and commercial goods transport

- → Small particulates (PM10 or PM2.5) estimated to cause over 3.7 million premature deaths per year worldwide;
- → In 2012, diesel PM was officially classified as carcinogenic (WHO);
- → The smaller part of PM is black carbon (BC), now believed the second most important climate pollutant;
- → Vehicular emissions, esp diesel vehicles, are responsible for 50-80% of the PM/ BC pollution in cities
- → **Exposure highest 300 - 500 meters from roadway**

3.7 million deaths attributed to outdoor air pollution



88% in low-middle income countries

455,000 in high-income countries

Over half of world's population lives in urban areas; **only 12% of cities** have air quality measures that meet **WHO standards**

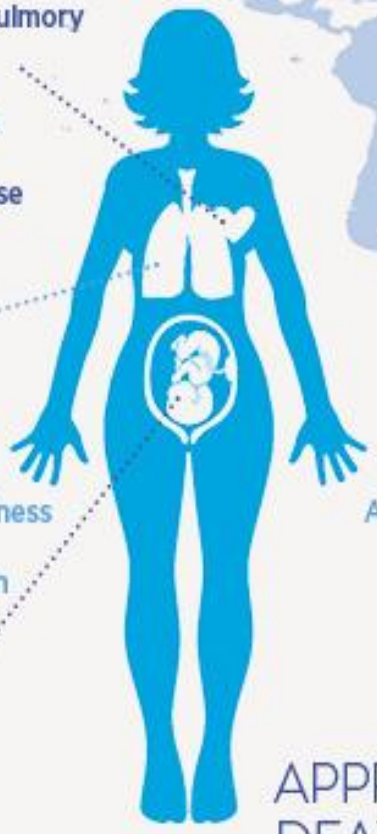
Ground level ozone impacts food security by **reducing crop yields** by up to **50 million tons** each year

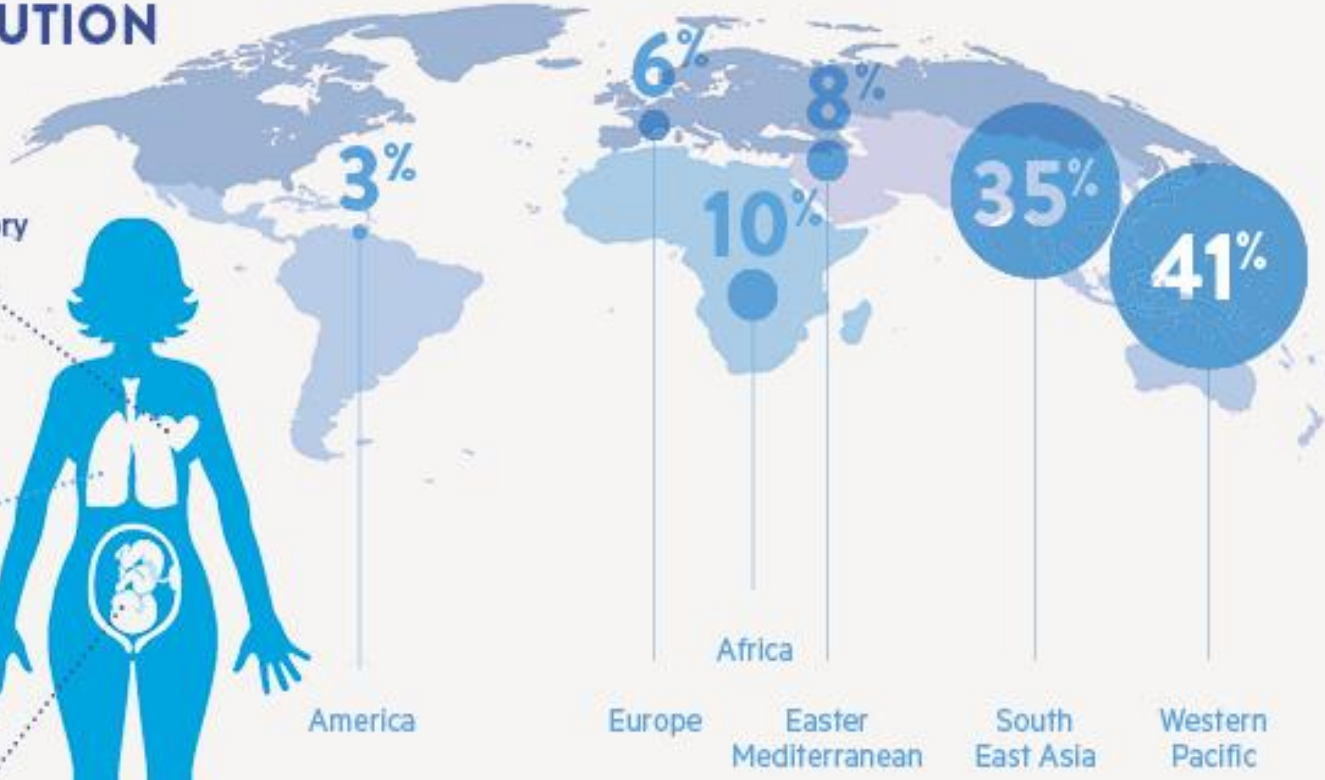
Financial cost of environmentally related **health risks** are in the range of **5%-10% of GDP**, with air pollution taking the highest toll

DISEASES DUE TO:

- O_3
- PM2.5 AIR POLLUTION

- Chronic obstructive pulmory diseazse (COPD)
- Childhood pneumonia
- Ischaemic heart disease
- Stroke
- Asthma
- Breathing problems airway inflammation
- Chronic respiratory illness
- Reduced lung function
- Low birth weight





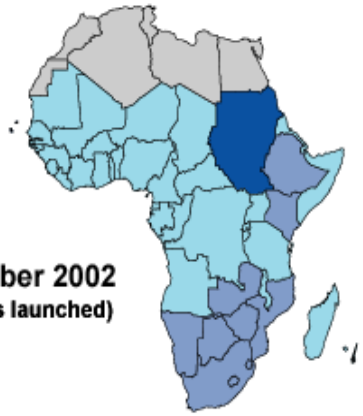
APPROXIMATE SHARE OF PREMATURE DEATH FROM **AIR POLLUTION** (YEAR 2012)

Progress of leaded petrol phase out in sub-Saharan Africa

Partnership for Clean Fuels and Vehicles

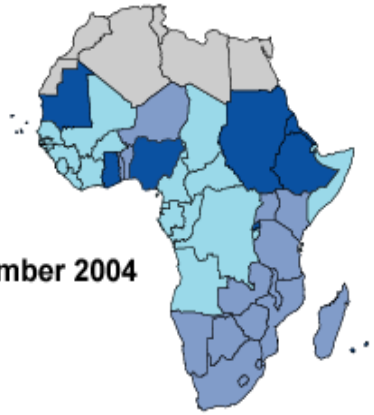
UNEP

June 2001
(A sub-regional agreement reached to phase out leaded gasoline by January 1, 2006)

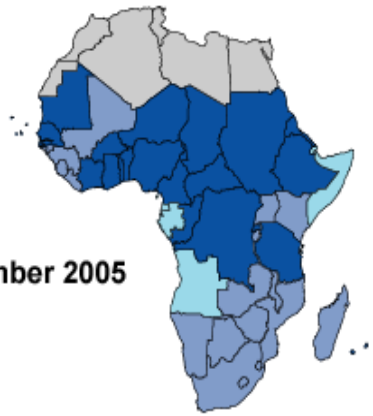


September 2002
(PCFV was launched)

September 2003



September 2004



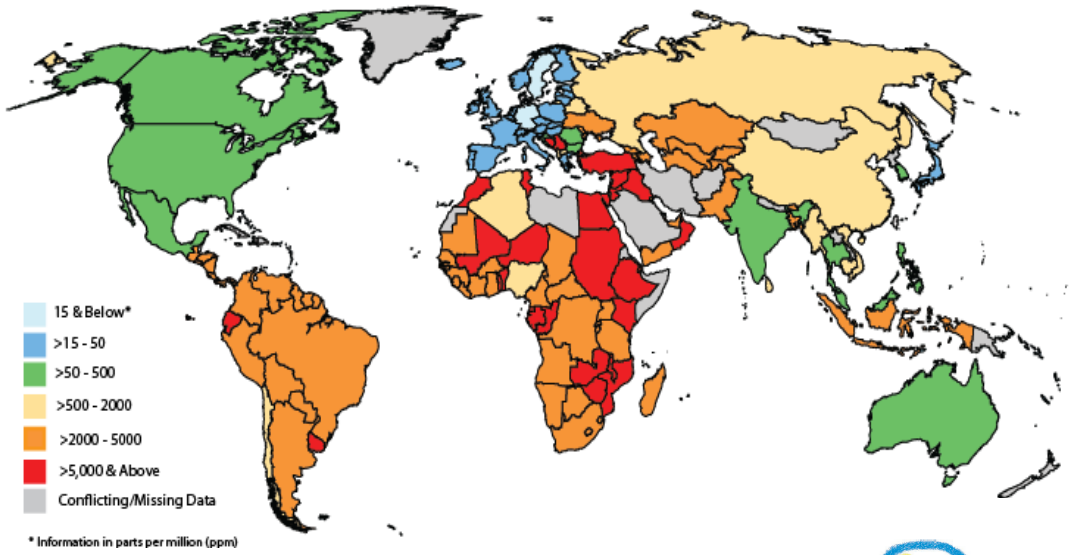
September 2005

January 2006

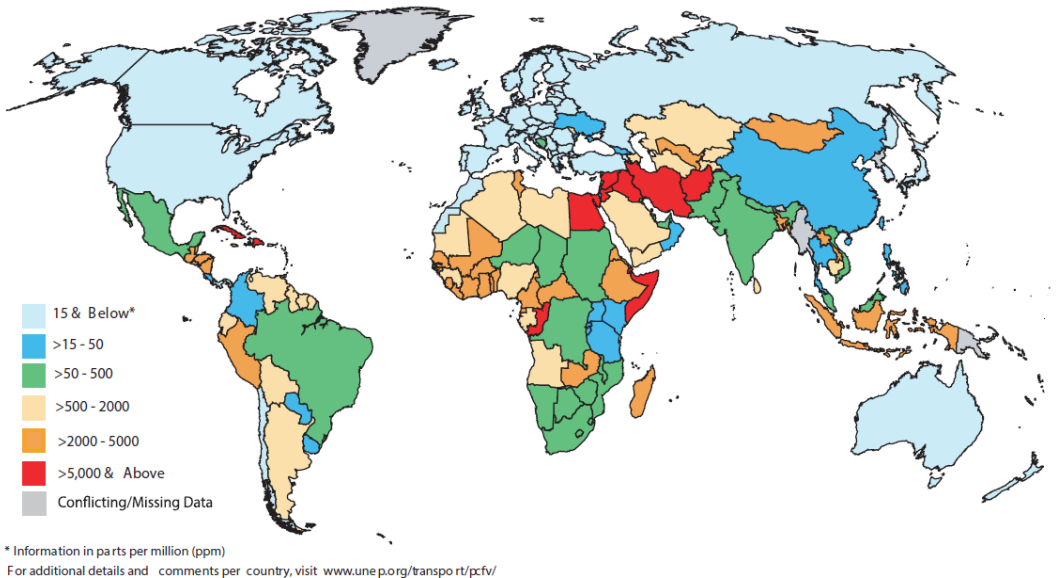
Leaded

Leaded and unleaded

Unleaded

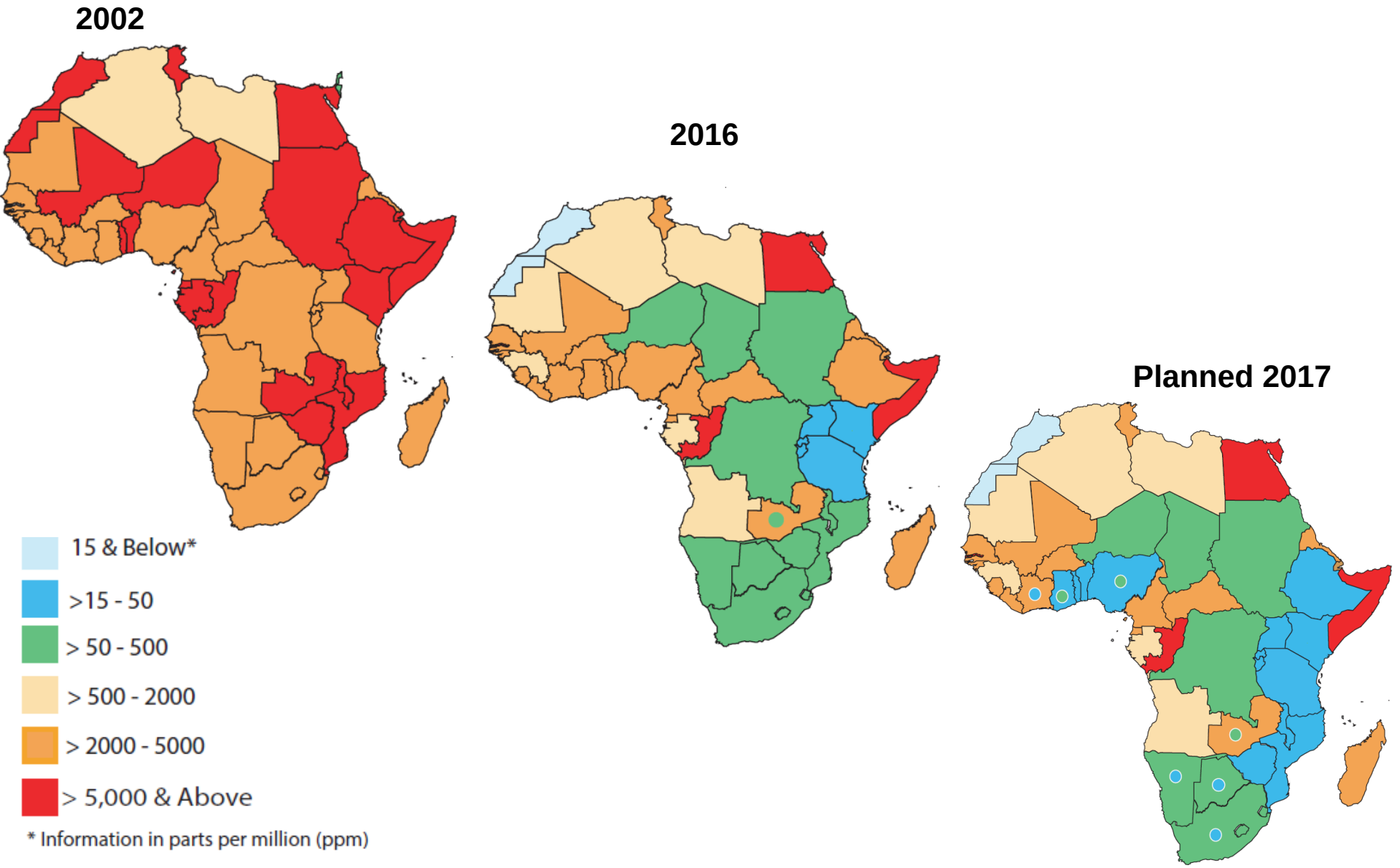


Diesel Sulphur 2005 and 2016

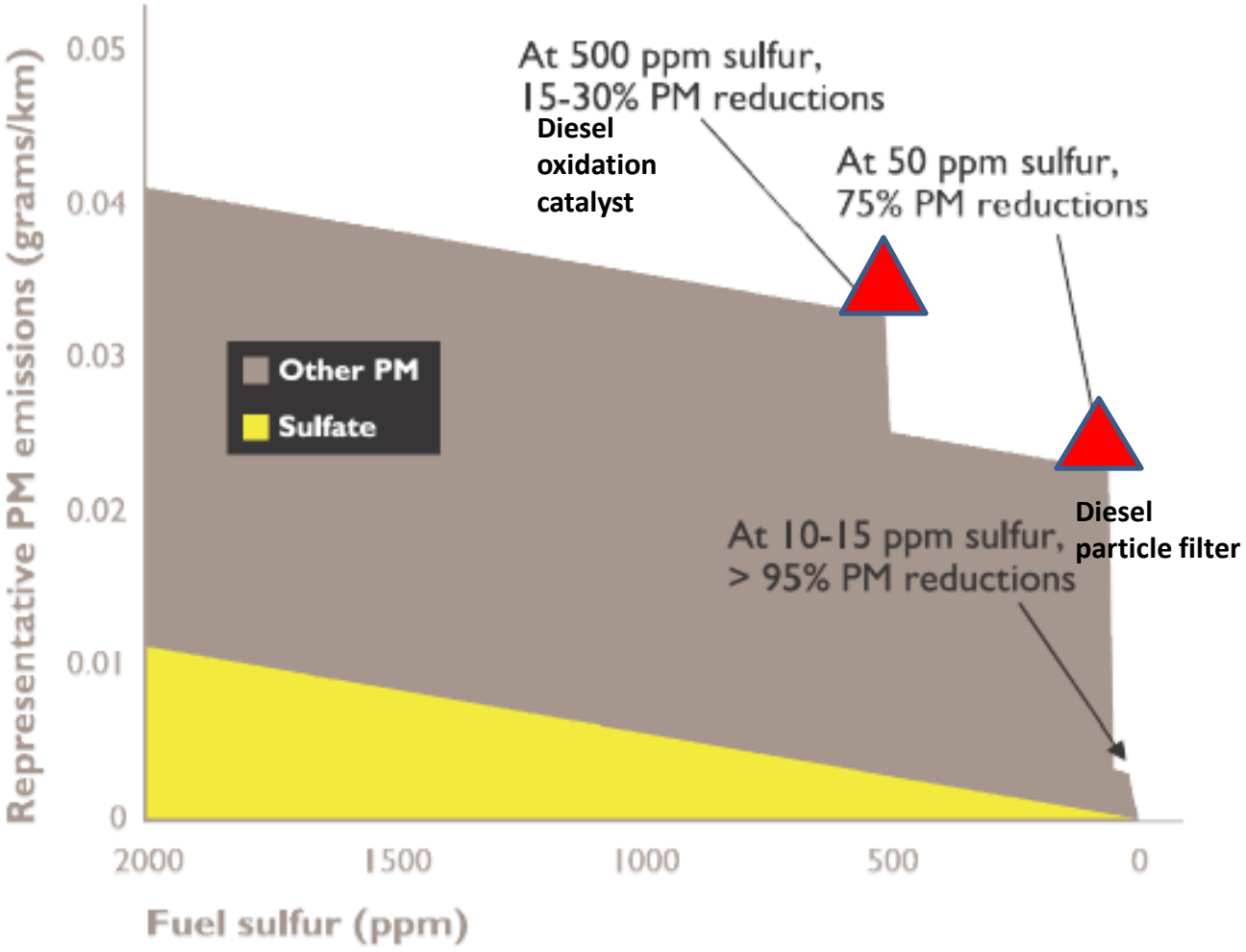


- 13 countries at 50 ppm & below
- More countries have lowered sulphur levels
- More cities at 50 ppm

Progress in Lowering Sulphur in Diesel in Africa



Low Sulphur Fuels reduce PM directly, open door to emission controls and advanced technology



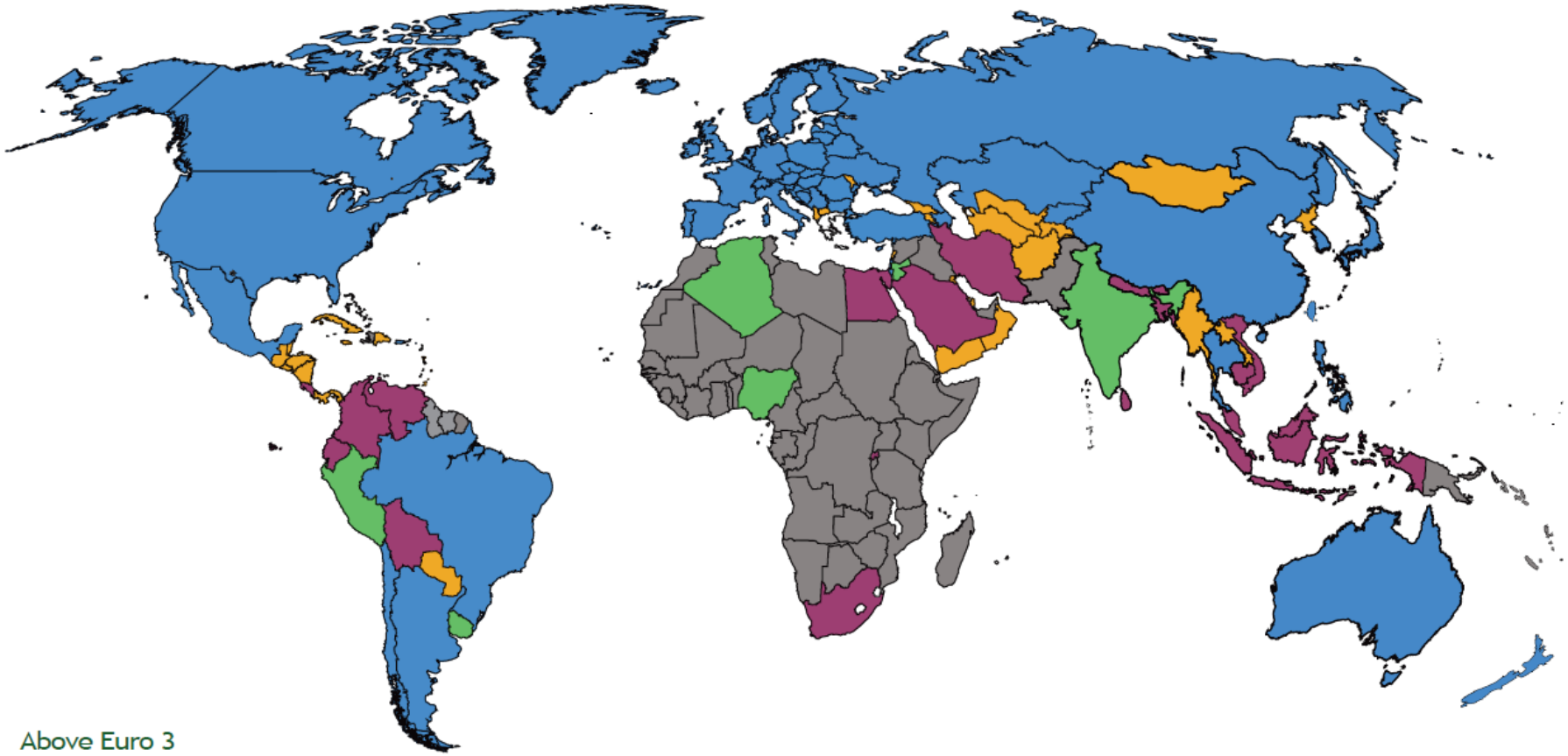
500 ppm, 50 ppm critical vehicle technology breakpoints for catalysts and filters

Partnership for Clean Fuels and Vehicles

Vehicle Emissions Standards

December 2016

UNEP



- Above Euro 3
- Euro 3
- Below Euro 3
- No Policy
- Unkown

www.unep.org/Transport/pcfv

Stringent vehicle emission standards can reduce pollution by over 85%

No retrofit system
Uncontrolled Diesel Exhaust
(Level 1)

Old technlogy
Little black carbon removal
Little ultrafine PM removal
Does not remove lube oil ash

Retrofitted with
Diesel Oxidation Catalyst (DOC)
(Level 1)

Old technlogy
Little black carbon removal
Little ultrafine PM removal
Does not remove lube oil ash

Retrofitted with
Partial Filter
(Level 2)

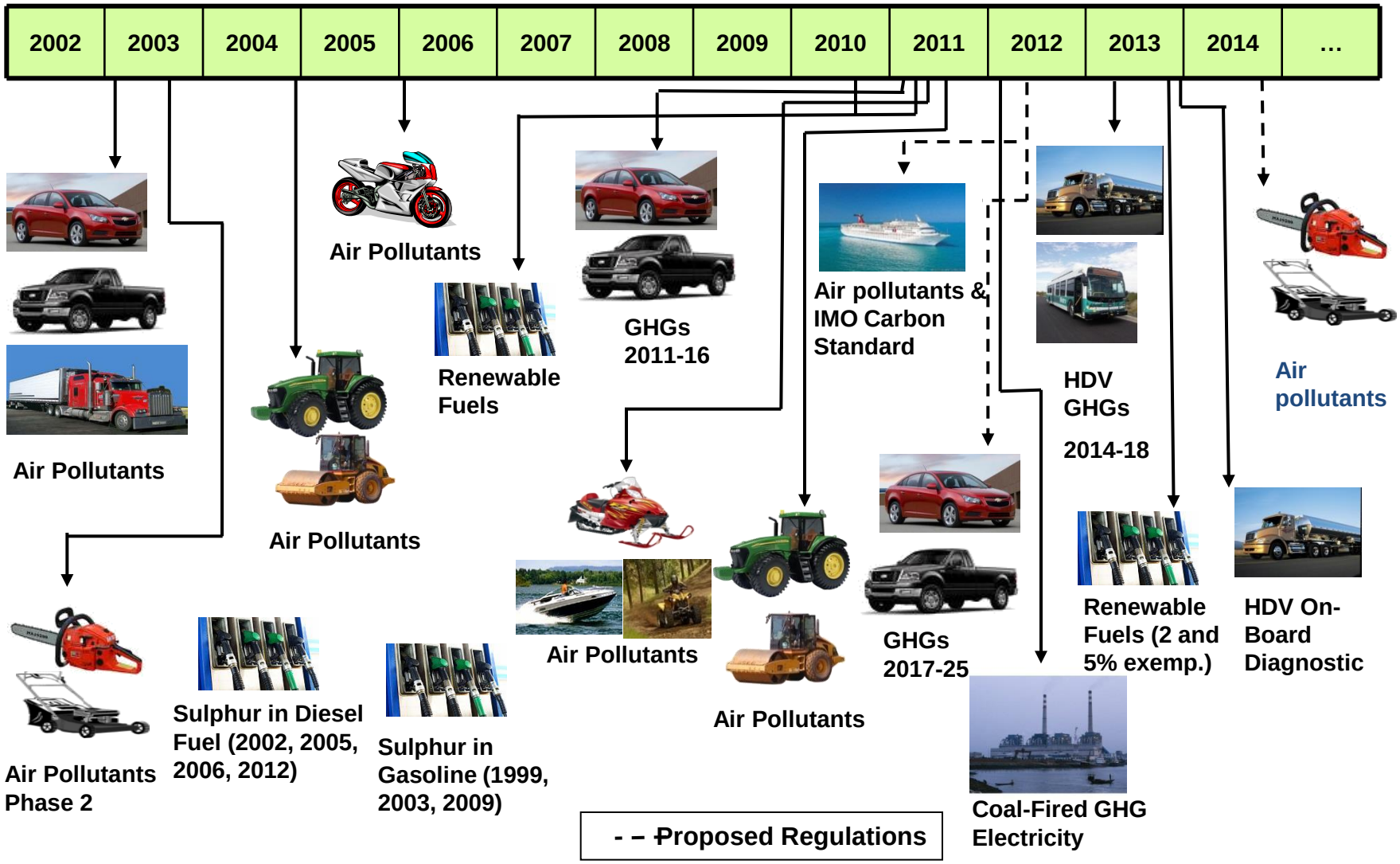
Little black carbon removal
Little ultrafine PM removal
Does not remove lube oil ash

Retrofitted with
Diesel Particulate Filter (DPF)
(Level 3)

New Technology
Used on all new trucks since 2007
>85% black carbon removal
>85% ultrafine removal
>85% lube oil ash removal

- Cleaire Advanced Emission Controls LLC

Systems Approach: Canadian Vehicles and Fuel Quality Regulation



Paris drives old cars off its streets

Life | Fri Jul 1, 2016 8:33am

Paris banned old, exhaust-belching cars from its streets on Friday in a war on air pollution that environmentalists hope will also drive dirty vehicles from the centers of other European cities.

Air pollution, in large part caused by fine particulate fuel emissions, **kills 48,000 people each year in France, some 400,000 in Europe**.

Any car registered before Jan. 1, 1997, will be barred from the city's streets from Monday to Friday, from 8 a.m. to 8 p.m.

Paris Mayor Anne Hidalgo says the ban could be extended in 2020 to all combustion-engine cars more than nine years old.

Norway is planning to ban petrol- and diesel-fueled cars from 2025
Every year, around **23,500 Britons** die prematurely from **inhaling NOx** emissions such as nitrogen dioxide (NO2) particles, emitted by diesel engines. Another **29,000 die** from inhaling sooty particulate matter, from both diesel and petrol engines

New Delhi: Deliveries at night only; charged US$11 on light commercial vehicles and US$20 on large trucks; Proposing banning diesel vehicles older than 10 years; expected to have the world's highest number of premature deaths due to air pollution by **2025 with nearly 32,000 fatalities**

India court approves 'pollution toll' to clean up New Delhi

NEW DELHI, Friday

Diesel-guzzling trucks and commercial vehicles in India will soon have to pay a surcharge for entering New Delhi, after the country's top court today approved a trial plan to improve the capital's notoriously filthy air.

Successive Delhi governments have been criticised for failing to curb pollution from industry and chronic traffic in the city of 17 million, ranked as having the world's worst air quality by the World Health Organisation.

Acting on a petitioner's plea, the Supreme Court approved an extra charge of 700 rupees ($11) on light commercial vehicles and 1,300 rupees on large trucks entering Delhi.

The court is scheduled to pass an official order on Monday on the surcharge, which it said would apply for four months on an "experimental basis", with no start date yet specified.

Oil tankers, passenger buses, ambulances and trucks carrying some food will not have to pay up, the court added.

Many environmental activists welcomed the toll, saying it would help to clear the capital's polluted air before winter starts, when quality deteriorates.

But campaign group Greenpeace India called the move a "temporary solution" that focused on diverting pollution rather than reducing it.

"Even if the trucks don't enter the capital, they are still polluting other parts of the country," campaigner Nandikesh Sivalingam said in a statement to AFP.

$11

Additional amount light commercial vehicles will be charged on entering city

"Air pollution is no longer a Delhi issue, it's a national issue."

Banned from the city during the day, thousands of trucks pour into Delhi every night, adding to the toxic cocktail of smog, according to the Delhi-based Centre for Science and Environment).

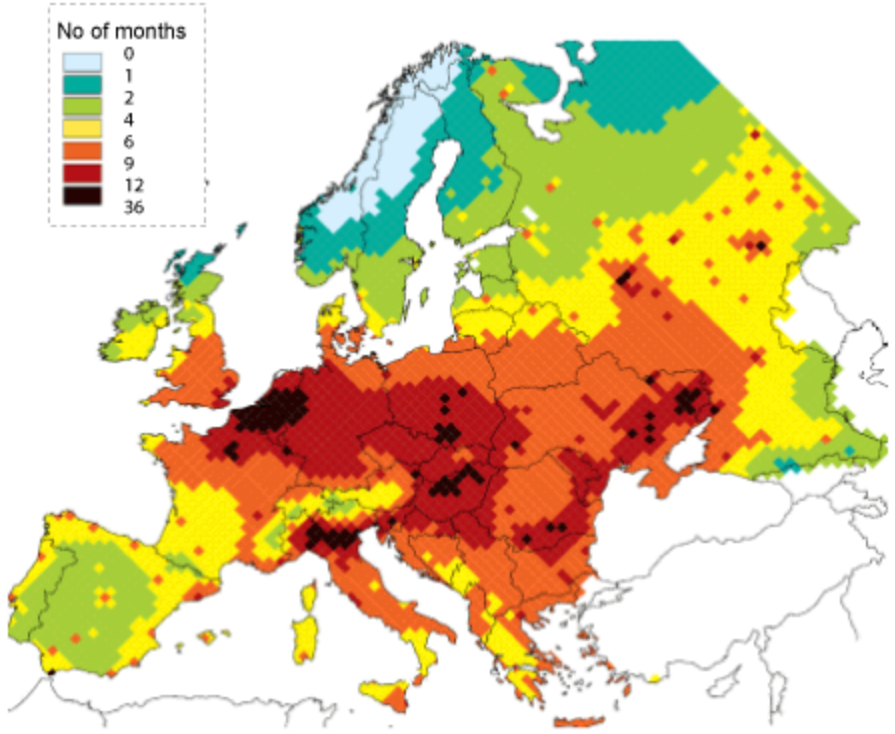
The independent centre says about 52,000 commercial vehicles enter the city daily — more than double government estimates. *(AFP)*

EU Vehicle Emission standards/ Diesel fuel requirements

Year	Standard	Specification
1994	Euro 1	Maximum sulphur limit of 0.2% (wt.) = 2,000 ppm for all gas oils, including diesel fuel. Minimum cetane number was 49.
1996	Euro 2	A maximum sulphur limit of 0.05% (wt.) = 500 ppm for diesel fuel.
2000	Euro 3	A maximum sulphur limit of 0.035% (wt.) = 350 ppm and cetane number of 51 for diesel fuel.
2005	Euro 4	A maximum sulphur limit of 0.005% (wt.) = 50 ppm for diesel fuel. "Sulphur-free" 10 ppm sulphur diesel fuel must be available for highway vehicles.
2009	Euro 5	A maximum sulphur limit of 0.001% (wt.) = 10 ppm ("sulphur-free") for diesel fuel for highway and nonroad vehicles

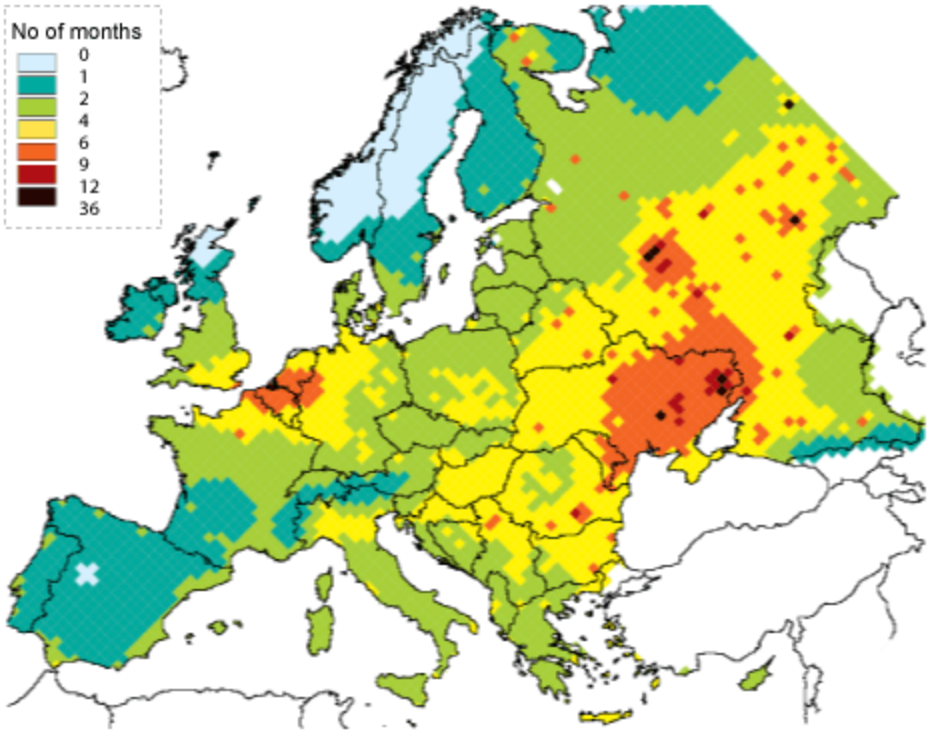
Progress in PM reductions in Europe 2000 - 2020

→ **Reduction in life expectancy due to exposure to PM 2,5**
Year 2000



SOURCE: Clean Air for Europe Programme / www.environment.no

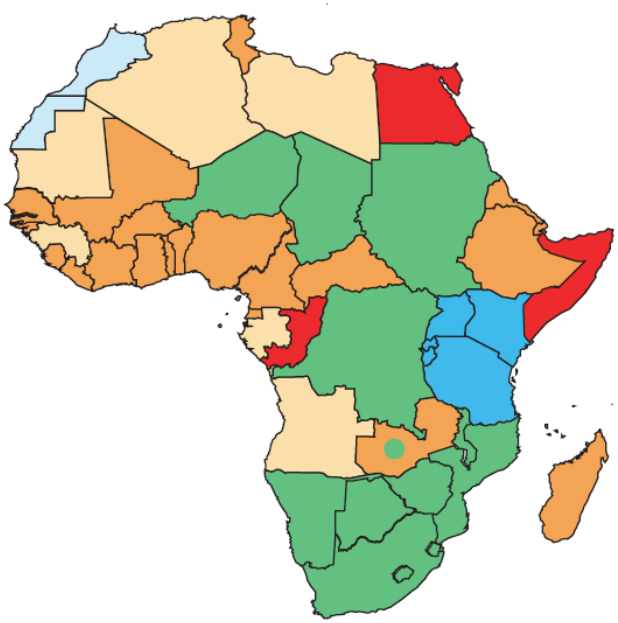
→ **Reduction in life expectancy due to exposure to PM 2,5**
Year 2020



SOURCE: Clean Air for Europe Programme / www.environment.no

Support to West Africa/ECOWAS

- No country has low sulphur fuels – 50 ppm even at city level in ECOWAS region
- Nigeria has Euro 2 vehicle emission standards
- Collaborating with the Economic Community of West African States (ECOWAS)
- Regional workshop held in May 2015 with 11 countries participating
- Participants called for political will by all member states to adopt to low sulphur fuels with ECOWAS to lead fuel harmonization process



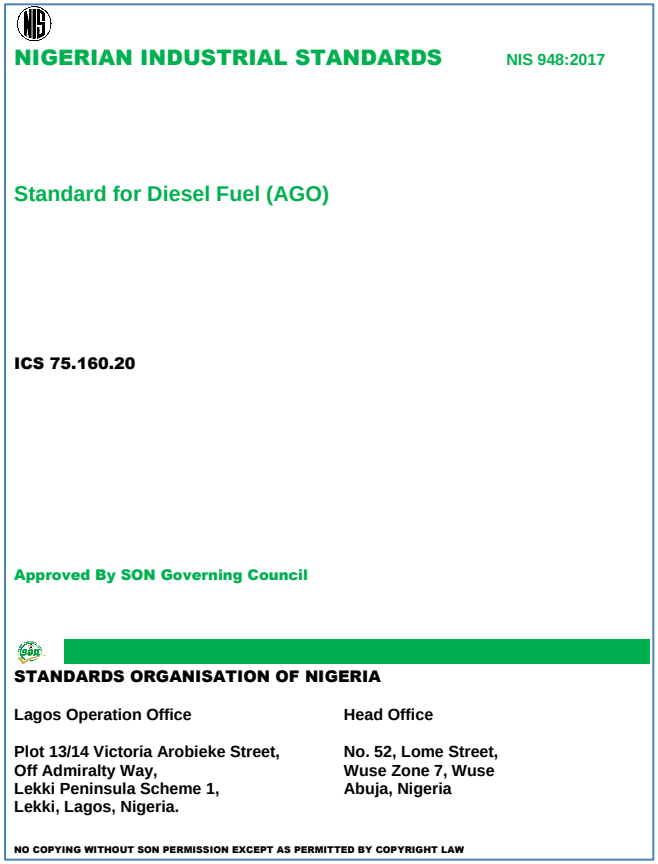
Follow-up Sub-regional workshop

- A follow up sub-regional for Nigeria and neighboring countries was held in June 2016 - Nigeria, Ghana, Togo, Benin and Cote d'Ivoire, and ECOWAS

- Participants recommended actions at regional level and national level:
  - Technical meetings to develop a regional strategy
  - Regional cooperation, collaboration and information sharing
  - Importation of 50 ppm diesel
  - Refinery upgrading

High Level Ministers Meeting

- Sub-regional Ministerial follow up meeting held 1 December 2016
- The high level ministerial meeting was hosted by the Nigeria Federal Minister of Environment Hon. Mrs. Amina L. Mohamed
- Nigeria, Ghana, Togo, Benin and Cote d'Ivoire, and ECOWAS recommended the introduction of low sulphur diesel – 50 ppm diesel fuel standards by 1 July 2017
- Refineries would be granted waivers to upgrade their facilities to produce low sulphur fuels by 2020
- 50ppm diesel standards already prepared in Ghana and Nigeria (adopted)
- National low sulphur fuels meetings planned in Togo and Benin in June 2017



NIGERIAN INDUSTRIAL STANDARDS NIS 948:2017

Standard for Diesel Fuel (AGO)

ICS 75.160.20

Approved By SON Governing Council

STANDARDS ORGANISATION OF NIGERIA

Lagos Operation Office
Plot 13/14 Victoria Arobieke Street,
Off Admiralty Way,
Lekki Peninsula Scheme 1,
Lekki, Lagos, Nigeria.

Head Office
No. 52, Lome Street,
Wuse Zone 7, Wuse
Abuja, Nigeria

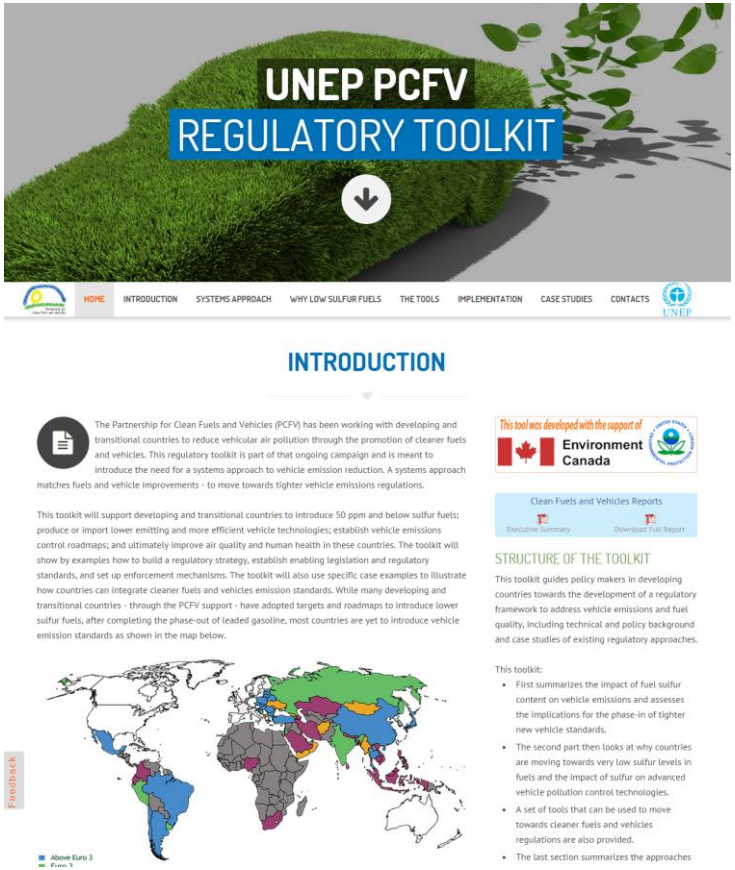
Next steps to sustainable transport

Cleaner fuels & vehicles (50ppm/Euro 4 vehicles emission standards)

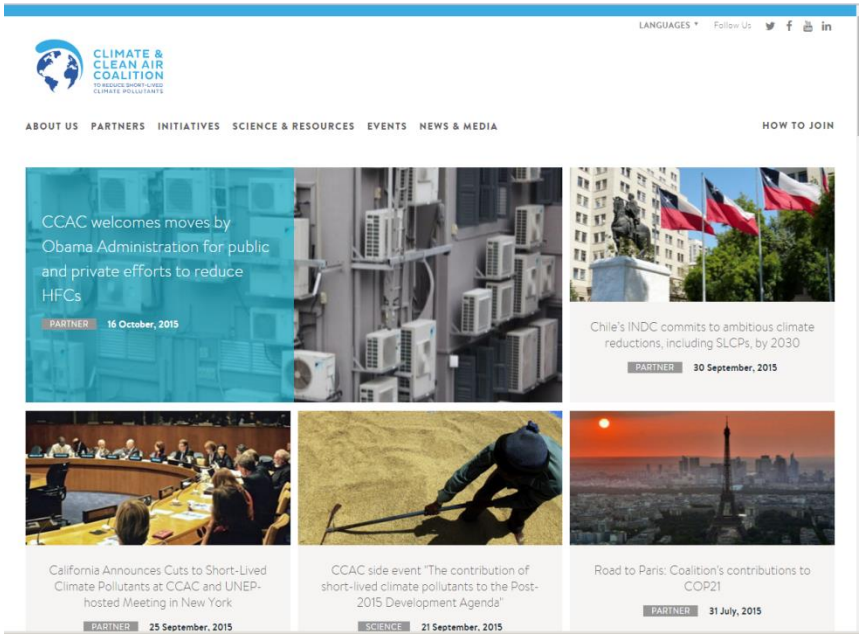
Clean soot free buses esp for BRT (Euro IV and above)

Cleaner, more fuel economy vehicles

NMT policies and infrastructure



www.unep.org/transport



http://ccacoalition.org/en/initiatives/diesel

Thank you