

Fuels and Technologies to mitigate emissions

November 10, 2015
9:30am Manila Time

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- *The LEDS Global Partnership does not endorse or recommend specific products or services. Information provided in this webinar is feature on the LEDS Global Partnership web site as one of many best practices resources reviewed and selected by technical experts.*

SOME HOUSEKEEPING ITEMS

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SOME HOUSEKEEPING ITEMS (CONTINUED)

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Having trouble with the webinar:

- A video/audio recording of this webinar and slide decks will be available at:

ledsgp.org/transport

AGENDA

- Overview of the LEDS Global Partnership & Transport Working Group
- Presentation:
Fuels and Technologies to mitigate emissions
- Questions and Answers
- Closing Remarks
- Survey

LEDS GLOBAL PARTNERSHIP

*Advancing Climate-Resilient Low Emission Development
Around the World*

Mission

Harness the collective knowledge and resources of governments, donors and international organizations, and practitioners in scaling up and strengthening implementation of climate-resilient low emission development around the world.

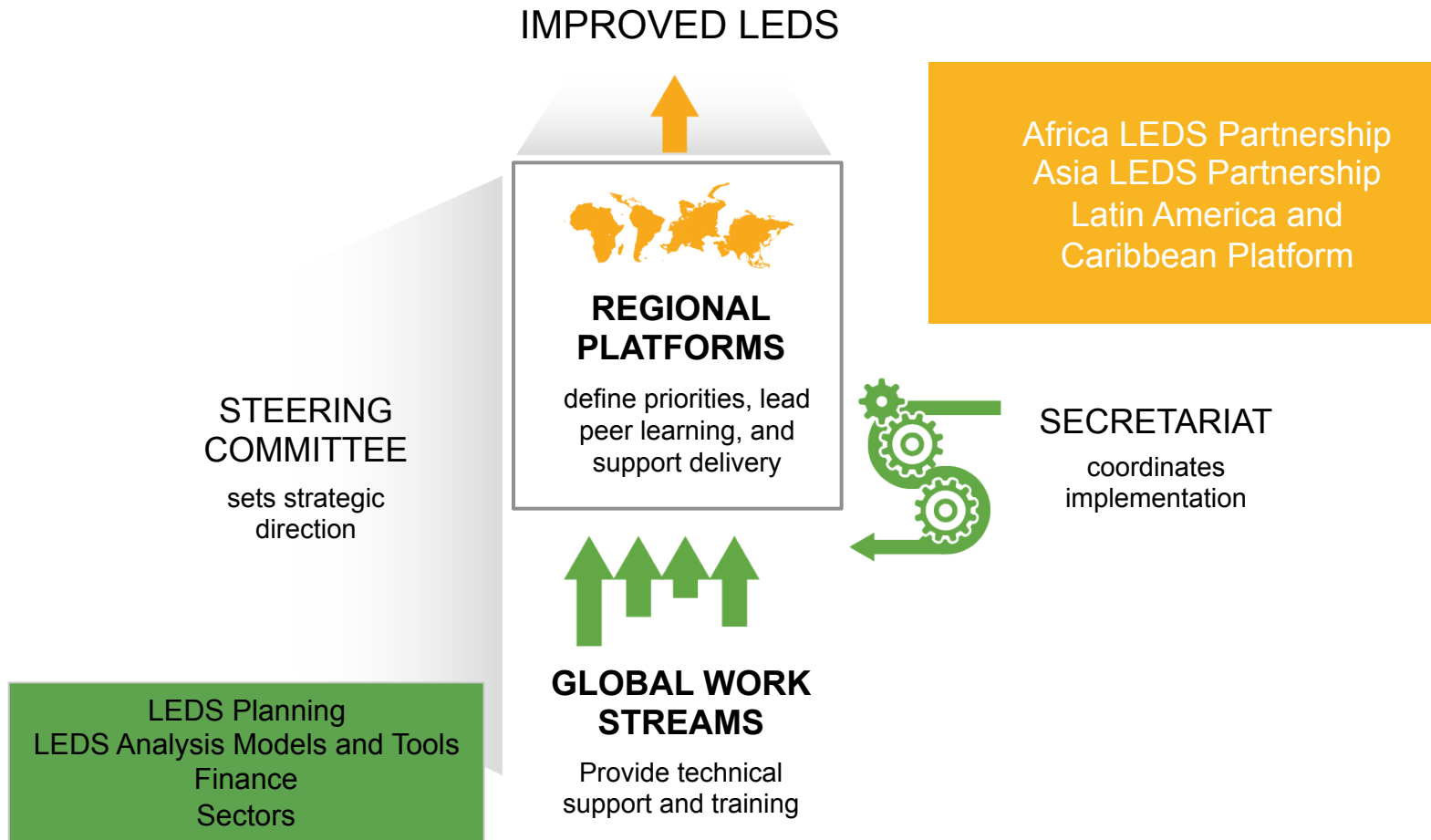
Objectives

- **Strengthen quality, coordinated support, and leadership** of climate-resilient low emission development strategies by countries in all regions
- **Foster effective implementation** of LEDS
- **Spur development of new LEDS** by additional national and sub-national governments

Launched in 2011, the LEDS GP now catalyzes action and collaboration across more than 120 countries and international organizations.



LEDS GP ORGANIZATIONAL STRUCTURE



EXAMPLES OF LEDS GP SUPPORT

Peer learning and knowledge sharing

- Global and regional workshops and trainings for more than 800 practitioners on LEDS planning, analysis, finance, and sectoral programs

Technical collaboration

- Transportation and Development Impacts Assessment (DIA) toolkits and country assistance
- National LEDS Finance Strategies with Colombia, Peru, and Chile
- No cost expert assistance available on LEDS analysis, finance, and sector measures to all members
 - e.g. support to Mauritius on solar hot water program, Bhutan on transport options, Indonesia on budget allocation, Cambodia on green fund, and Cote D'Ivoire on bio-energy

Understanding and analysis of LEDS benefits

- Application of DIA visual tool with Ghana, Kenya, and Montenegro
- Broader portfolio of shared LEDS communication resources under development



Learn more at:
www.LEDSGP.org

LEDS Transport Working Group

Leaders

- EMBARQ, the sustainable urban mobility initiative of WRI Ross Center for Sustainable Cities
- United States National Renewable Energy Laboratory (NREL)
- United Nations Environment Programme (UNEP)

Global

- LEDS Transport Toolkit (ledsgp.org/transport)
- Webinars
- Global events and trainings

Regional

- Workshops that serves the specific needs of that region
- Matchmakers for knowledge sharing

Local

- Deep dive, in-country support for governments on specific transport issues and policies
 - Workshops with peer experts
 - Technical assistance
- Remote Expert Assistance on LEDS (REAL)



LEDS
GLOBAL PARTNERSHIP

Advancing climate-resilient low emission development around the world

WORKING GROUP

TRANSPORT WORKING GROUP

Supporting sustainable transport systems of tomorrow



Countries facing significantly increasing demand for transport services over the coming decades have a unique opportunity to meet this demand and enable economic growth minimizing greenhouse gas (GHG) emissions. Sustainable transport systems are based on minimizing travel; shifting to more environmentally (as well as socially and economically) sustainable mobility; and improving transport technologies, fuels, and institutions. The Low Emission Development Strategies Global Partnership (LEDS GP) Transport Working Group provides technical assistance, tools, and training on strategies that support low-emission development in transport systems.

The Working Group is building a LEDS transport community, supporting champions and innovators, creating networks of experts on low-emission transport, and exploring opportunities for collaboration at local and regional levels. A team of international transport experts from EMBARQ, the sustainable urban mobility initiative of WRI Ross Center for Sustainable Cities, the United States Department of Energy's National Renewable Energy Laboratory (NREL) and the United Nations Environment Programme (UNEP) are leading these activities.

Avoid-Shift-Improve approach to sustainable transportation system development

The traditional approach to developing transportation systems has focused on expanding infrastructure—building new roads, rails, and vehicles to meet growing demand. This approach has led to proliferating sprawl, traffic congestion and associated economic impacts, costs to public health from reduced local air quality and increased accidents, and direct and indirect costs of global climate change impacts.

Sustainable transport system development is based on an Avoid-Shift-Improve (ASI) approach—which moves the focus to the policies and behaviors behind the demand for transport. LEDS prioritizes solutions that seek to “avoid” or reduce trips through the integration of land use and transport planning; that “shift” to more efficient and less carbon intensive modes such as public transport, walking and bicycling; and that “improve” the environmental efficiency from each kilometer traveled by enhancing vehicle and fuel technology. This approach addresses the long-term root of problems rather than marginally improving the status quo.



The Avoid-Shift-Improve (ASI) framework supports the holistic design of sustainable low-emission development strategies for transportation systems.

Supporting countries with implementing new vehicle emission fuel quality standards

This webinar is part of a training brought to you by the LEDS Transport Working Group, in partnership with the United Nations Environment Program (UNEP) and Clean Air Asia. The series will include*:

- Improving air quality and reducing climate impacts from the transport sector
- Roadmap for implementing new fuel economy standards: Case of Mexico
- Case study presentation: Introduction of Euro IV fuel
- Innovative financing solutions for low carbon transport projects to improve air quality

**Topics may be subject to change*

Fuels and Technologies to mitigate emissions



Presenter:

Erin Cooper

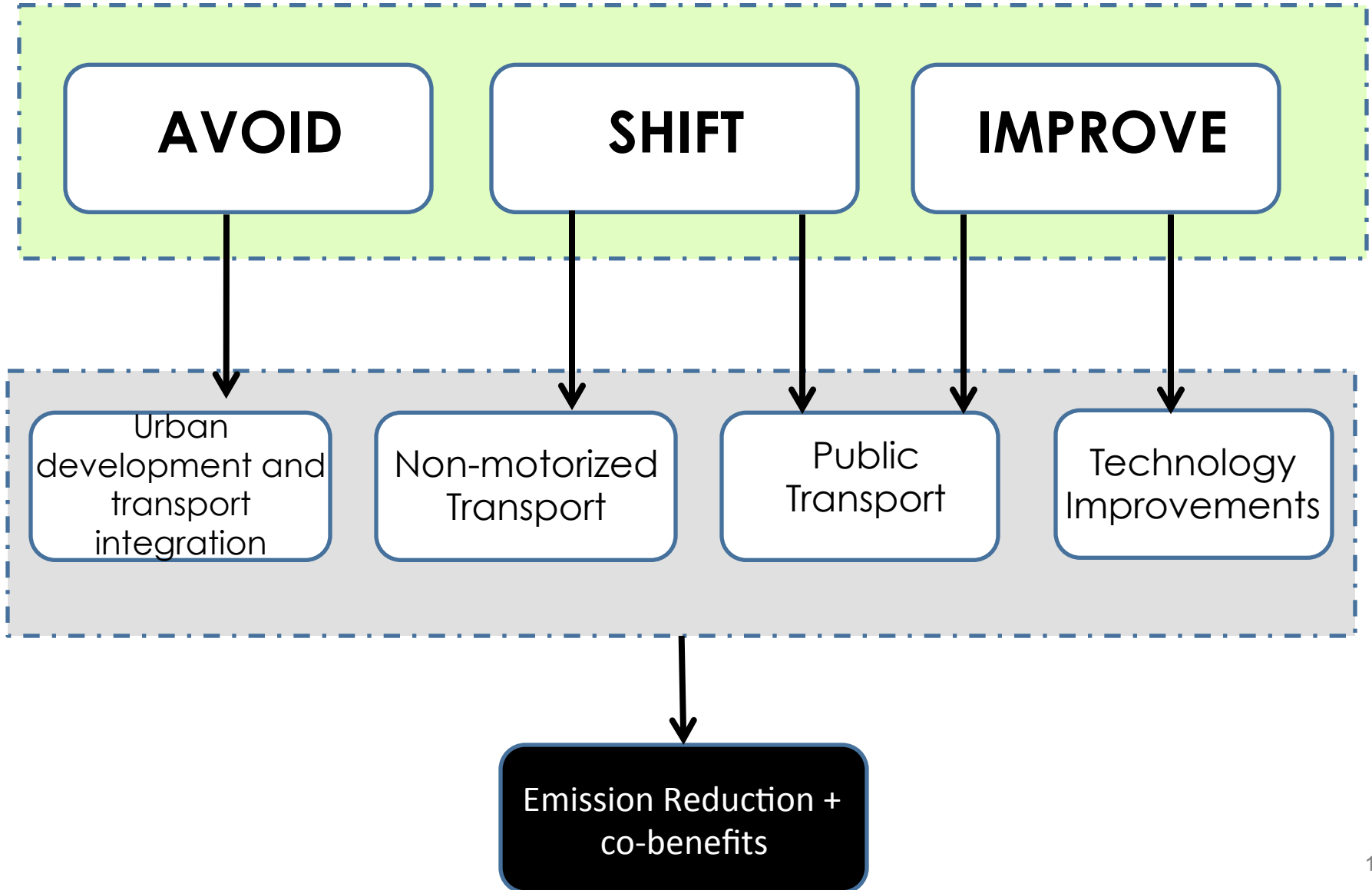
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Fuels and technologies to mitigate emissions

1. Purpose of improved fuel and emissions standards
2. Major pollutants that are regulated
3. Vehicle technologies for reducing emissions
4. Why cleaner fuel is needed to reduce emissions
5. Examples of improved fuel and technology

Reducing Emissions in the Transport Sector

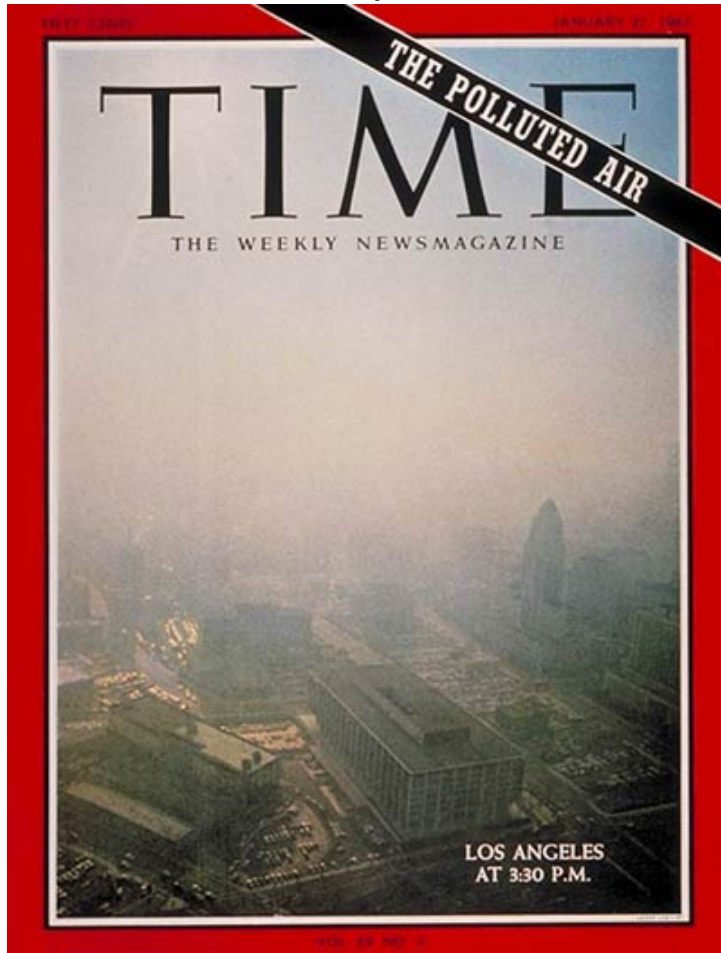


Improve: Transit Bus Emissions

- Help transit agencies address both global and local air quality and GHG issues.
- Work on ‘real’ emissions or in-use emissions of vehicles
- Heavy-duty vehicles, including transit buses are responsible for more CO2 emissions in low and middle income countries (Schipper, 2009).

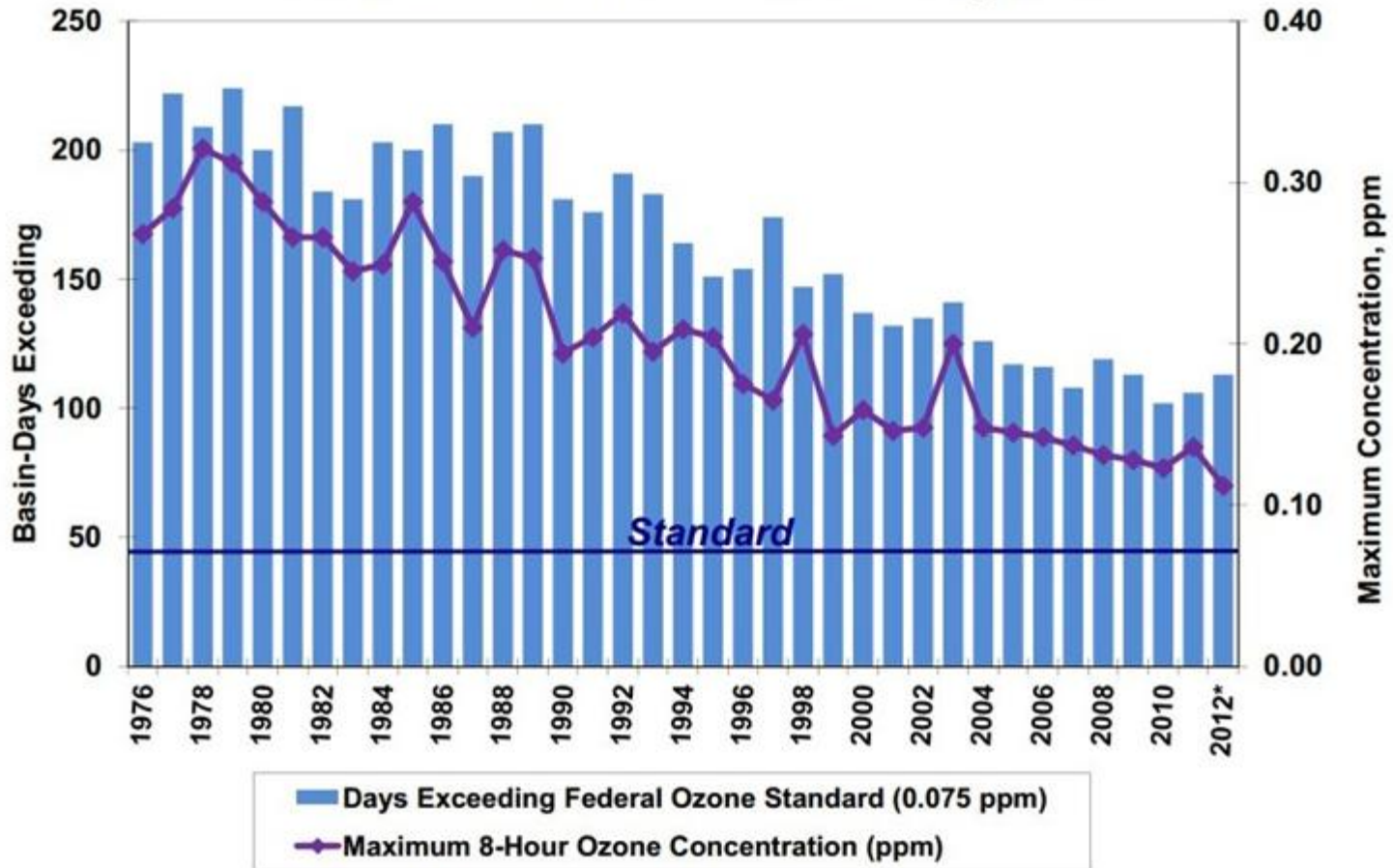
Cleaner fuel leads to less harmful emissions

Jan. 27, 1967



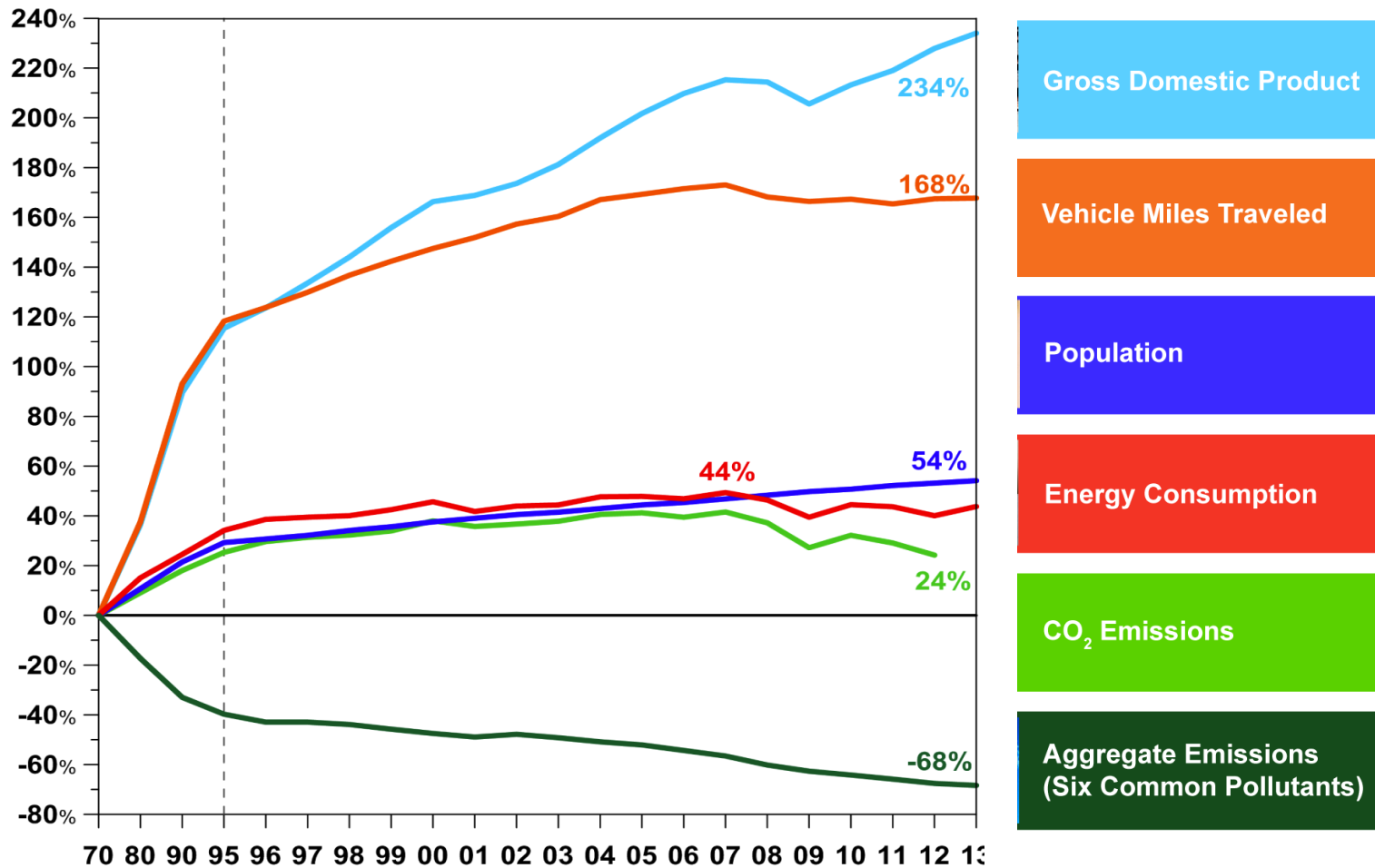
<http://content.time.com/time/covers/0,16641,19670127,00.html>

South Coast Air Basin Smog Trend

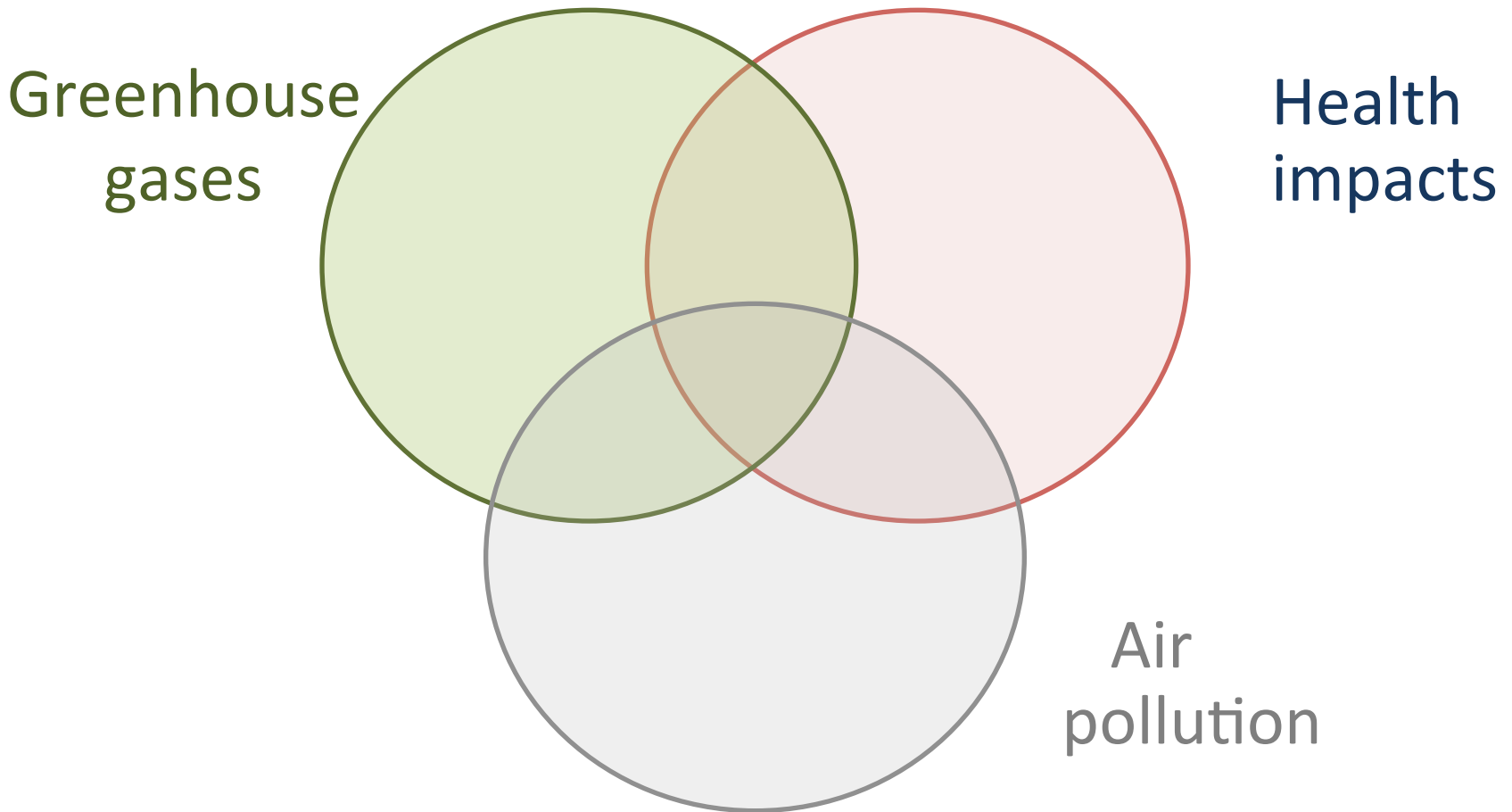


* Based on preliminary data for the year 2012.

Change in emissions in the US



Impacts of Pollutants

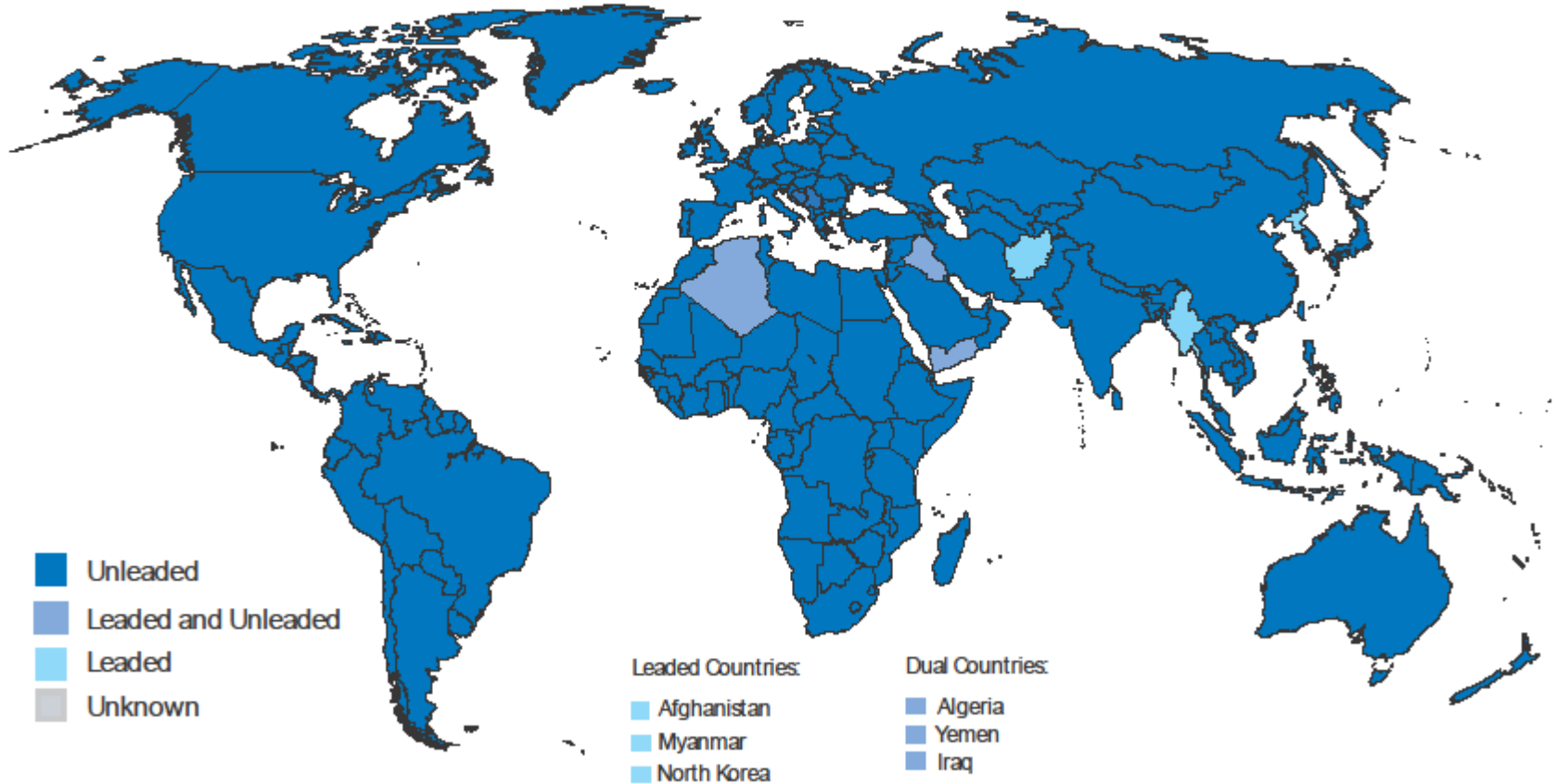


Transportation pollutants - Vehicle Emissions

- **Carbon Monoxide**
- **Carbon Dioxide**
- **Hydrocarbons**
- **Nitrogen Oxides**
- Methane
- **Particulate Matter**
- Sulfur Dioxide
- Ozone
- Volatile Organic Compounds

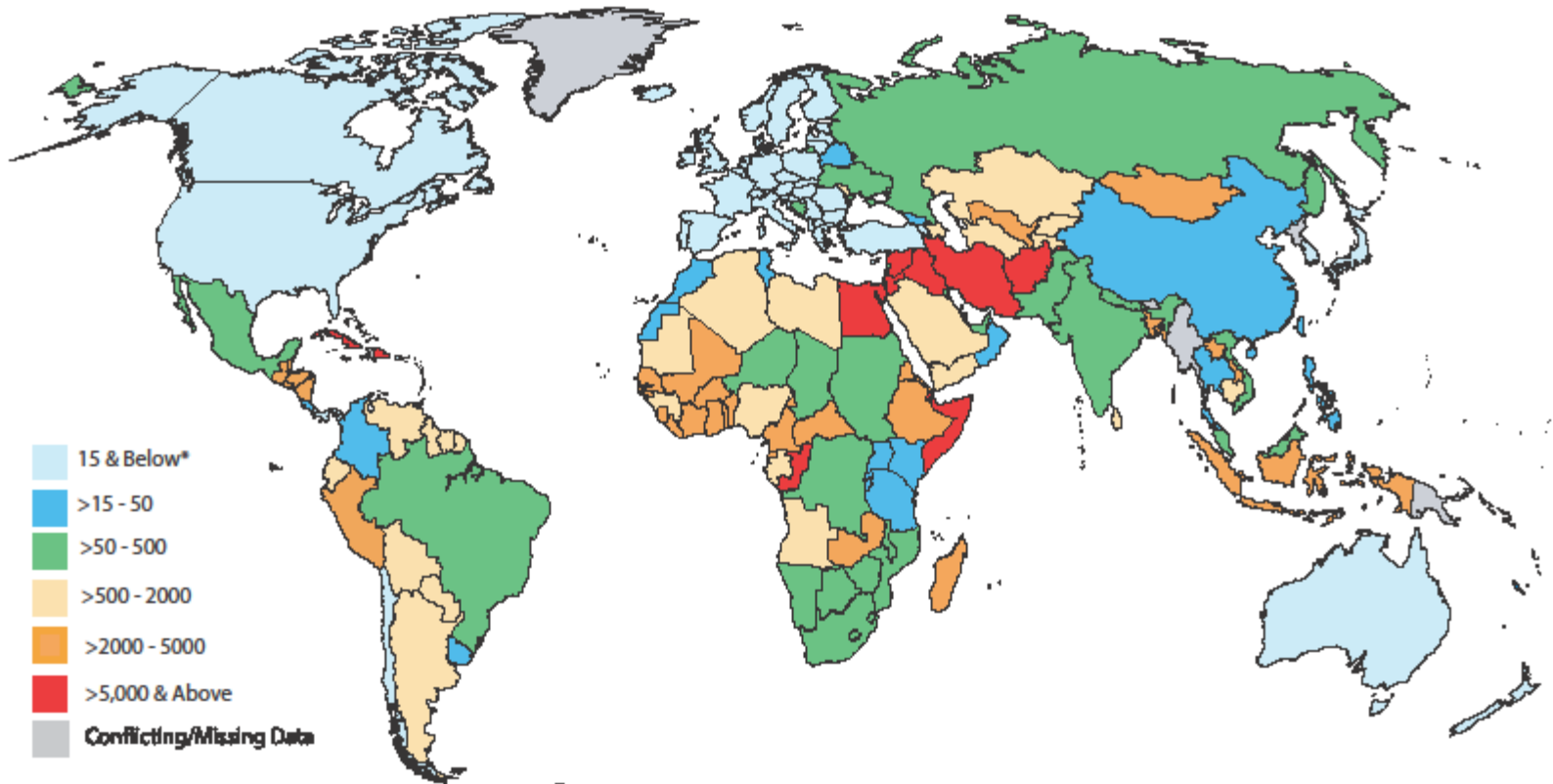


Leaded Petrol Phase-out: Global Status April 2014





Diesel Fuel Sulphur Levels: Global Status June 2015



* Information in parts per million (ppm)

For additional details and comments per country, visit www.unep.org/transport/pcf/

Ultra Low Sulfur Diesel

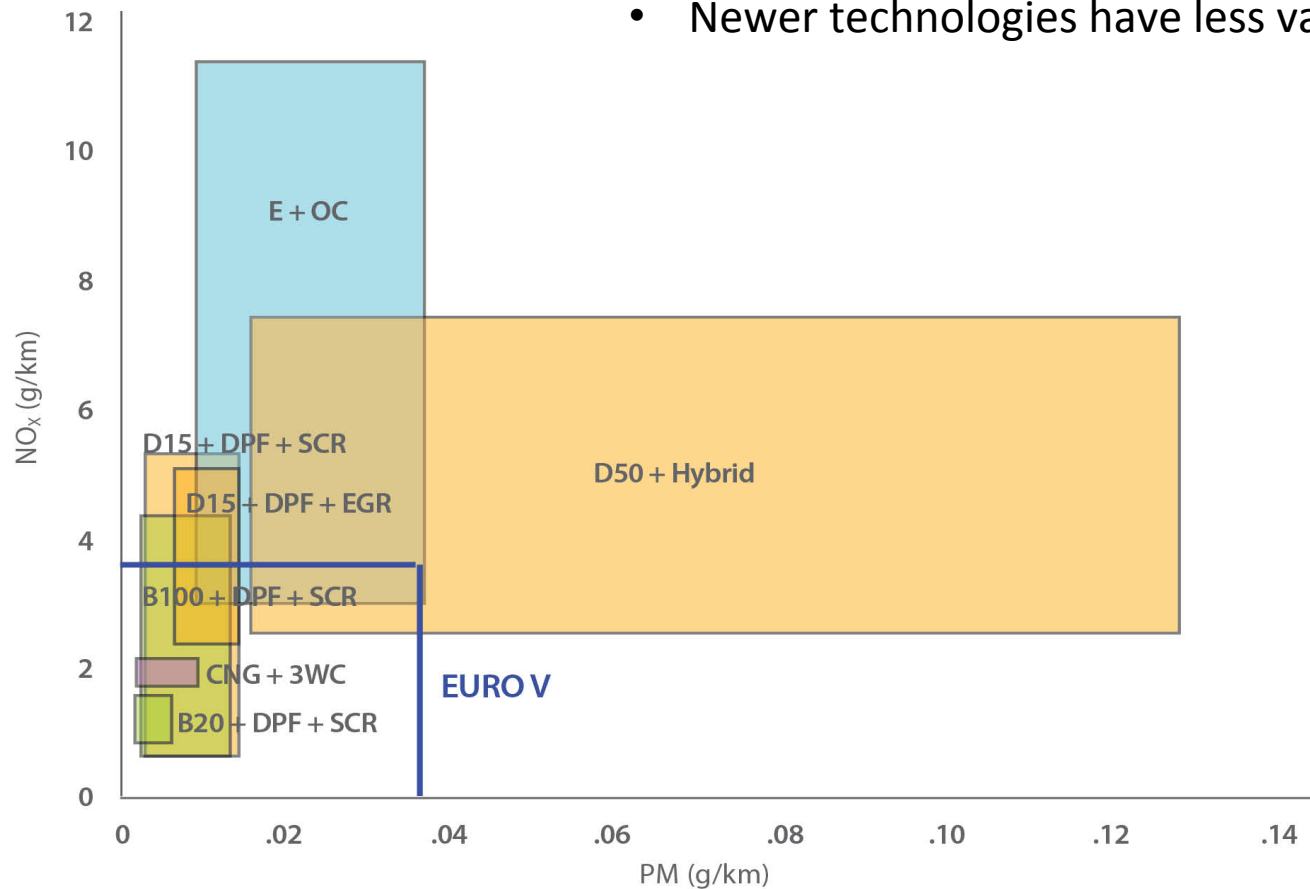
- **Advantages of ULSD:**
 - ULSD reduces emissions of sulfur compounds
 - ULSD enables advanced pollution control technology.
- **Clean Diesel Truck and Bus Program in US:** emissions reductions associated with this program were estimated to result in over \$70 billion in public health and welfare benefits through reduced hospitalizations and lost work days.

Debate on alternative fuels

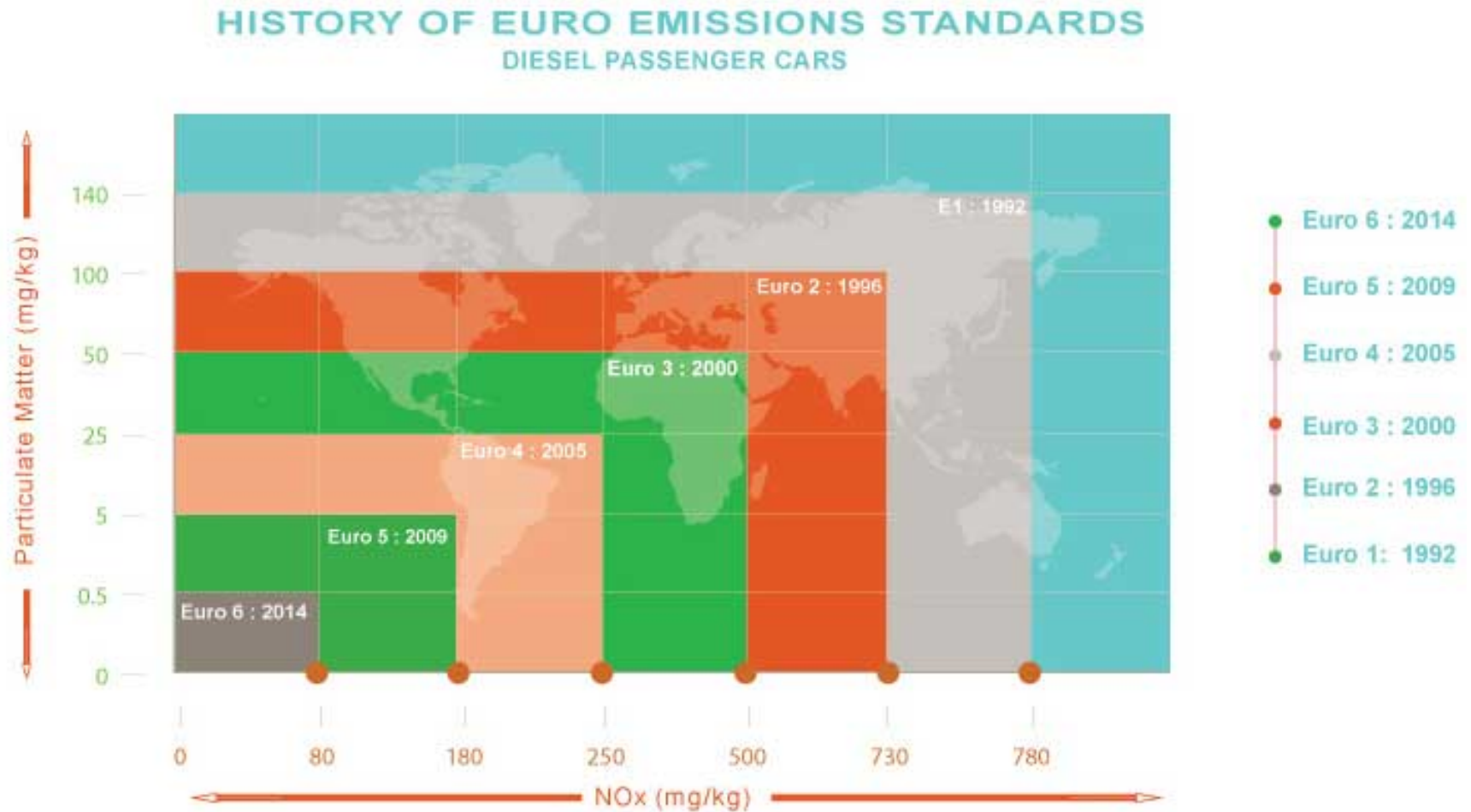
- Diesel
 - Biodiesel
 - Natural gas
 - Ethanol
-
- Not only fuel is important, but a combination of fuel and technology
-
- Hybrid
 - Electric

Brazil context: NOx vs. PM

- Variety of fuels meets Euro v standard
- Newer technologies have less variation



Evolution of technical standards – Nox vs. PM



<http://www.clm.co.uk/euro6-emissions-ad-blue/>

Compliance with standards: Improved Technology

Fuel injection

Can reduce NOx, PM, and HC

Air-handling

Can reduce PM

Exhaust Gas Recirculation

Can reduce NOx

http://www.theicct.org/sites/default/files/publications/ICCT_LDVcostsreport_2012.pdf

Compliance with standards: Improved Technology – After treatment

Diesel Oxidation Catalyst:

reduces PM (20-40%), CO (10-60%), and HC (40-75%)

Diesel Particulate Filter:

reduces PM (85-95%), CO (50-90%), and HC (85-95%)

Selective Catalytic Reduction:

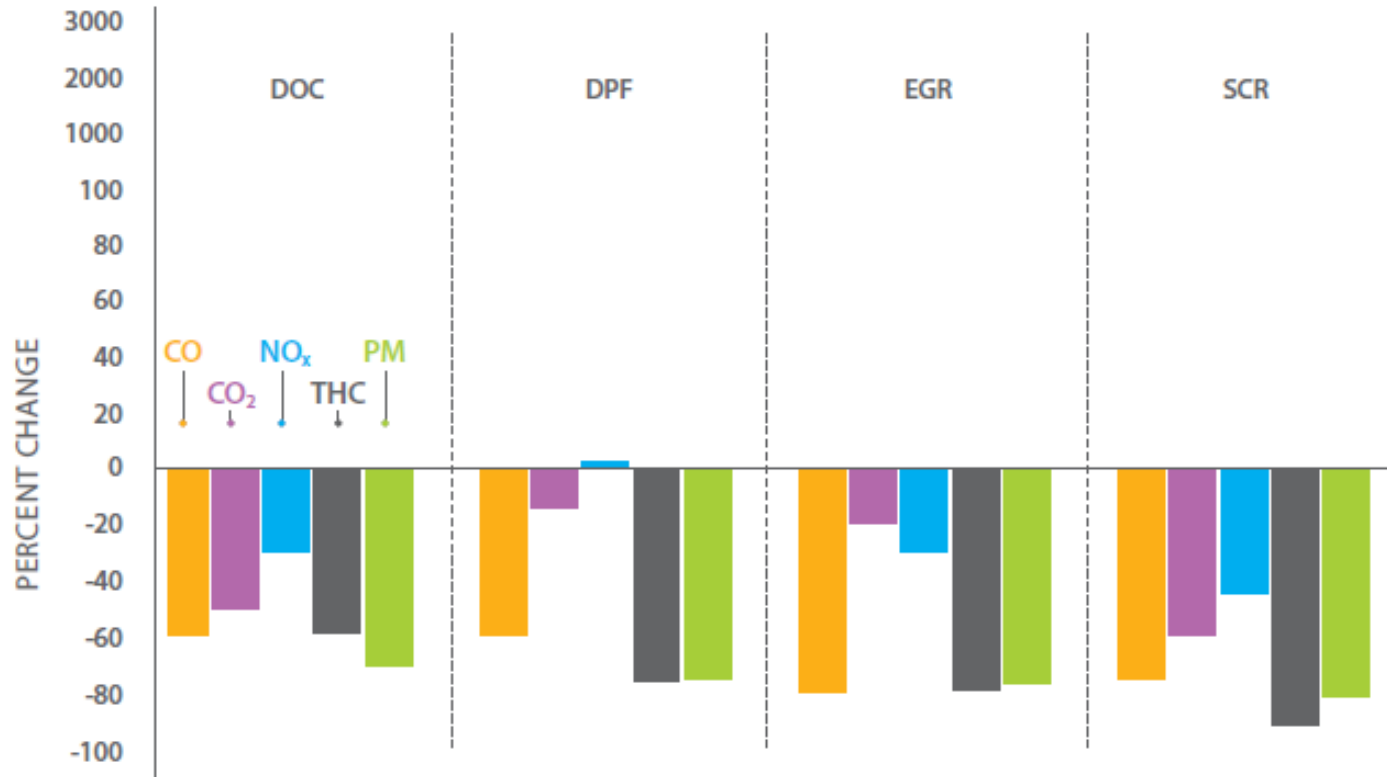
reduces Nox (up to 75%)

Lean NOx trap:

reduces Nox (5-40%)

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Diesel technologies in buses: With respect to ULSD, no technology



Compliance with standards: Improved Fuel

- 500 ppm needed for EGR
- 500 ppm needed for DOC
- 50 ppm needed for DPF

- US Department of Energy Study
 - DPFs cease to reduce PM emissions with fuels containing 150 ppm sulphur
 - DPFs become source of PM emissions with 350 ppm sulphur fuels

Philippines Euro IV Standard

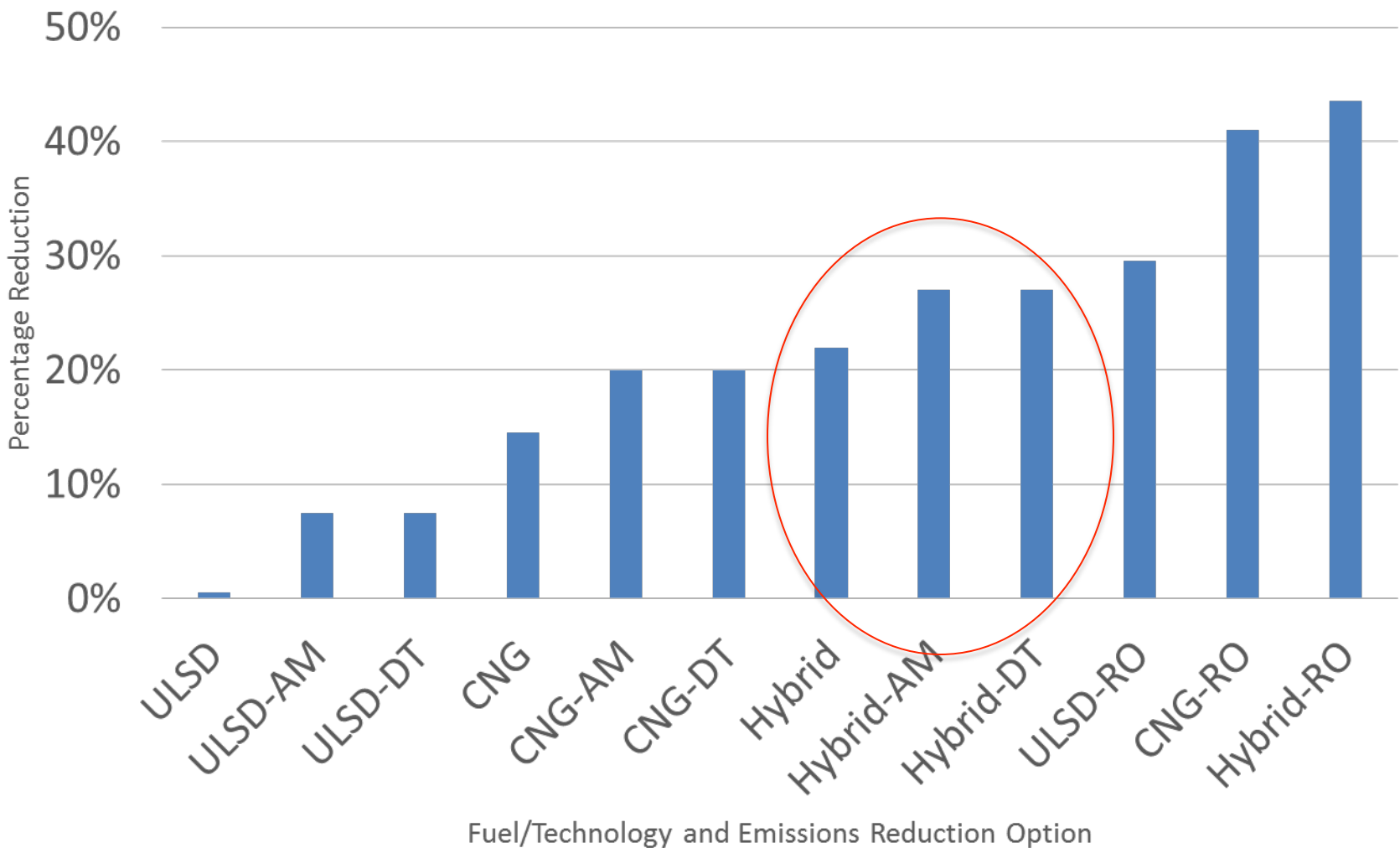
- Recently adopted
- Diesel sulfur content 50 ppm
- Regulations for:
 - Passenger vehicles, heavy duty vehicles, motorcycles, etc.
 - Both in-use and new
 - CO, HC, NO_x, and PM

<http://server2.denr.gov.ph/uploads/rmdd/dao-2015-04.pdf>

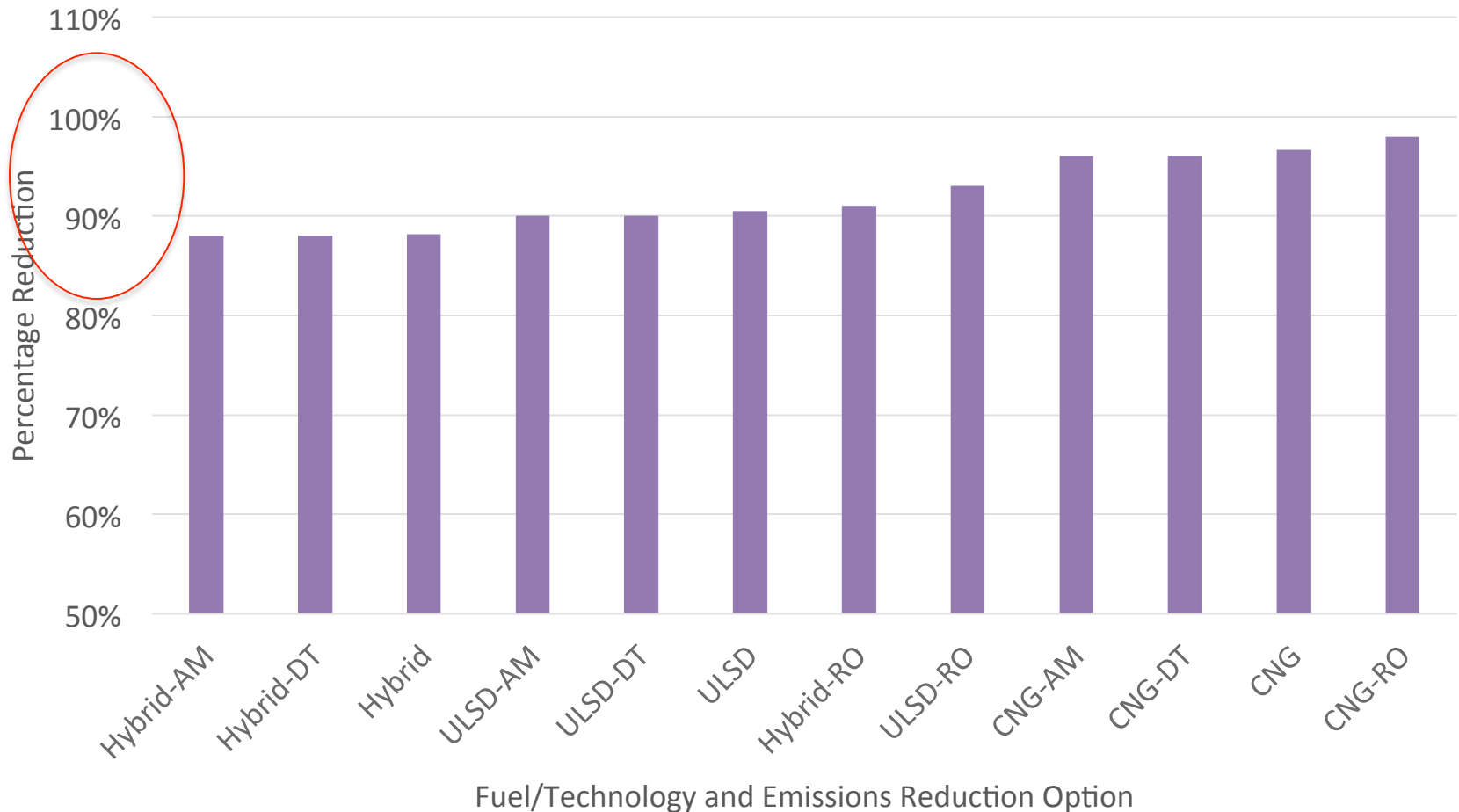
Emissions Reduction Scenarios

- Fuels and Technologies
- Advanced Maintenance
- Improved Transit routes
- Improved driver training

Hypothetical scenario for buses: converting Euro 3 to Euro 5 – CO2 reductions



Hypothetical scenario buses: converting Euro 3 to Euro 5 - PM reductions



Meralco Green Fleet Program: Using UNEP Toolkit for Clean Fleets

- Meralco South Distribution Services – fleet of 300 vehicles including passenger vehicles and trucks
- In 2009, goal of improving fuel efficiency
- Developed baseline for fuel consumption and kilometers traveled in 2008.

Meralco Green Fleet Program: Using UNEP Toolkit for Clean Fleets

- Determined priorities for reducing emissions:
 - Pick-up trucks, vans, basket trucks
 - Eco-driving, improved vehicle maintenance, using “right-size” vehicles
- From 2008 to 2009, improved fuel efficiency by 16%, reduced CO2 emissions by 10%, and reduced PM emissions by 4%.

Summary

It may be a long process, however:

- Improved fuels and technologies are very important for public health, the environment, and climate change
- Because emissions in the transport sector are growing rapidly, this is one of many important ways to reduce emissions.

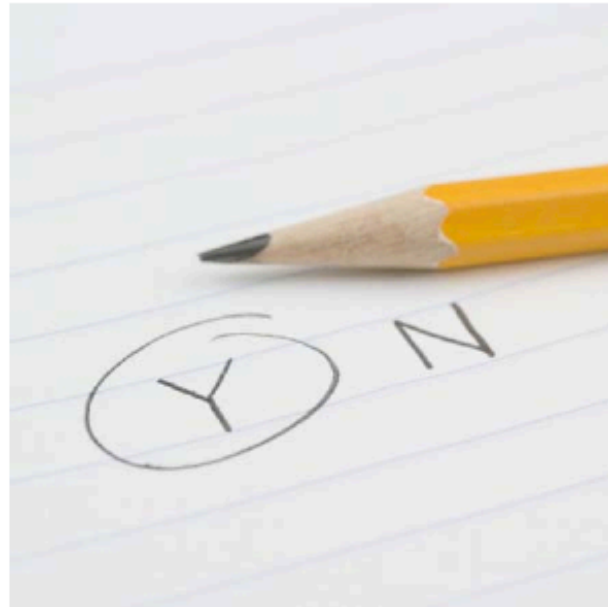
TIME FOR Q&A



Questions ?

SURVEY

- How did we do?
- Your feedback is important!



YOUR PARTICIPATION IS APPRECIATED

Thank You!

Contact:

transport@ledsgp.org

An audio recording of this webinar will be available at:

ledsgp.org/transport