

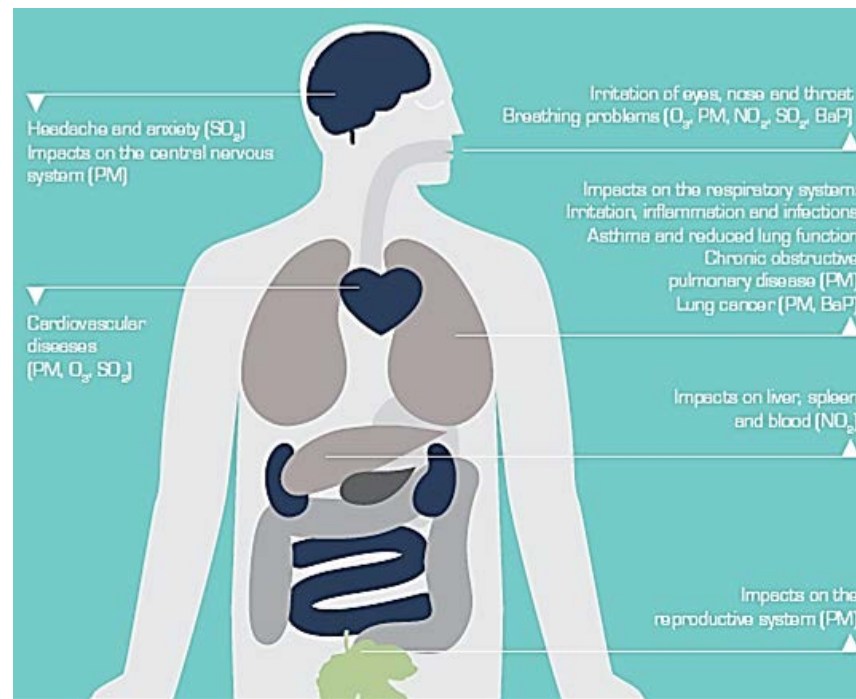
Diesel Engines Exhausts: Myths and Realities

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In June 2012, the World Health Organization's International Agency on Research on Cancer (IARC) concluded that diesel engine exhaust is carcinogenic to humans (IARC, 2012). IARC thereby changed its finding from 1988, when it classified diesel exhaust as probably being carcinogenic to humans.

Dr Kurt Straif, Head of the IARC Monographs Program, indicated that "the main studies that led to the above mentioned conclusion were in highly exposed workers (mines) and that they came up to this conclusion based on other carcinogens, such as radon, that initial studies showing a risk in heavily occupational groups were followed by positive finding for the general population"





Objective of this background note

The objective of this background note is:

- a) to offer a **balanced view** on the on-going debate about harmful effect of diesel engine exhausts emissions on human health and the environment
- b) to **take stock of recent studies** on the harmful effects of diesel exhausts to public health;
- c) to **provide information** about diesel emissions by different economic sectors including inland transport;
- d) to inform about **recent policy** developments on the reduction of pollutant emissions to address health and environmental concerns and
- e) to inform about any **technological developments** of diesel engines that reduce or even eliminate the harmful effects to public health.





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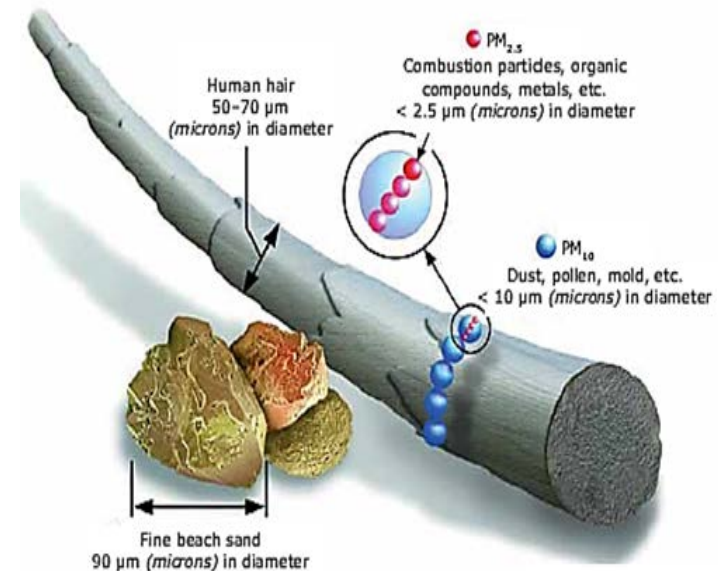
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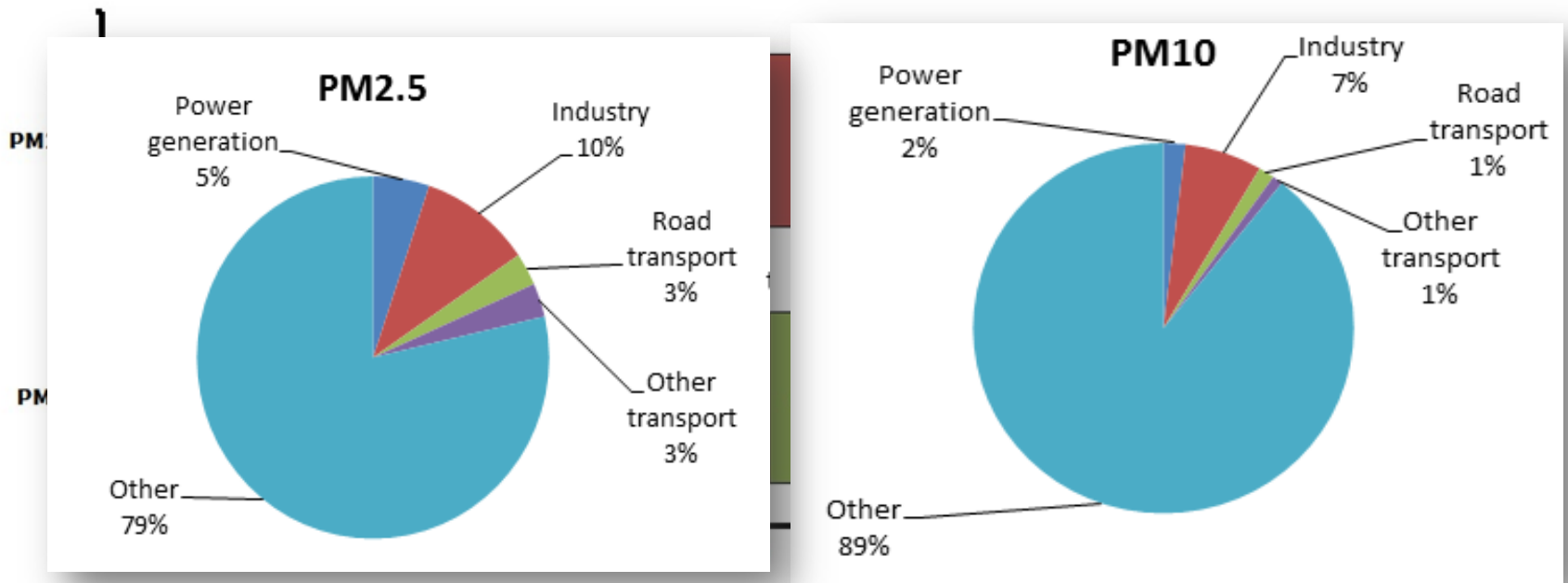


Particulate matter (PM):

PM is emitted from many sources and is a complex heterogeneous mixture comprising both primary and secondary PM. Primary PM is the fraction of PM that is emitted directly into the atmosphere, whereas secondary PM forms in the atmosphere following the oxidation and transformation of precursor gases (mainly SOX, NOX, NH3 and some volatile organic compounds (VOCs)). From a regulatory perspective, PM is divided into PM10 and PM2.5, defined (ISO, 2008) as the size fractions where the median aerodynamic diameter of the particles is respectively 10 and 2.5 microns (this means that 50 per cent of the particles in these fractions have diameters respectively greater, or smaller, than 10 microns and 2.5 microns).



Sector contributions of emissions of primary particulate matter and secondary precursors (EEA member countries)



Share of emissions of the particulate matter by economic sector in the United States

- Agriculture
- Energy production and distribution
- Industrial processes
- Other
- Solvent and product use

- Commercial, institutional and households
- Energy use in industry
- Non-road transport
- Road transport
- Waste

Source: EEA, 2012a



Conclusions

In summary, the following conclusions are drawn:

- (a) **Diesel engines emissions in the air are carcinogenic to humans** based on scientific research evidence; the emission of particulate matters is the most dangerous for humans health; the danger is the highest in closed areas, such as in-door and in areas with inadequate ventilation;
- (b) Diesel engines are currently at the heart of economic growth and of all economic activity and, therefore, it is **not feasible to replace** and eliminate them at this stage;
- (c) Transport is **only one of the sectors** using diesel engines. Industrial, agricultural, timber, commercial, institutional and household sector are some of the other economic sectors that use diesel engines;
- (d) The commercial, institutional and household sectors are the **most important source** of PM2.5 and PM10 ;
- (e) The transport sector is by far not the most significant source of PM emissions, nonetheless up till now it has been the **most rigorous** in introducing measures to address this issue;
- (f) The transport sector is the **most regulated** sector where the most intensive initiatives and actions have been taken. Decisions and performance oriented emission regulations have been adopted that set limits and targets resulting in the dramatic decrease in PM and other emissions;
- (g) Other **economic sectors are lagging behind** in their initiatives, strategies and actions to address their share of PM and pollutants emissions.





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Thank You!

