

AIR & NON-ROAD MACHINES

Non Road Mobile Machinery (NRMM) or diesel machines [1] refer to any machinery or vehicle with an engine that is not used for carrying passengers or goods on the road. Examples include construction machinery, inland ships, diesel locomotives, and garden equipment.

Diesel machines use the same type of engines as road vehicles and therefore emit similar pollutants. They emit nitrogen oxides (NO_x), particulate matter (PM), hydrocarbons (HC) and carbon monoxide (CO). All of these have negative effects on human health which include causing respiratory and cardiovascular diseases and even cancer. As well as harming humans, they damage our environment, causing acid rain and eutrophication.

Diesel machines emit significant levels of nitrogen oxides and particulate matter which have negative effects on human health and on the environment.

EU legislation

- In order to protect the health of European citizens and the environment, the EU has established emission limits for road transport and diesel machines [2]. Emission standards from diesel machines have become stricter over time. However, they have not proven efficient in tackling NO_x and PM emissions, both of which are particularly dangerous for human health and for the environment. These emissions have continued to grow in spite of the efforts made to reduce them because standards are not strict enough; the number of diesel machines in service has increased; certain categories of machines are not covered by legislation; and older machines, in use before the entry into force of relevant legislation, do not have to comply with the rules.
- Another problem with the existing legislation is the inadequate method used to calculate and therefore reduce PM emissions.
- The European Commission is expected to table a legislative proposal that aims to solve the shortcomings of diesel machine legislation.

FACTS AND FIGURES



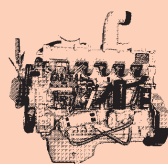
15% NO_x EMISSIONS

In 2010 diesel machines accounted for around 15% of NO_x emissions in the EU-27



5% PM EMISSIONS

In 2010 diesel machines emitted approximately 5% of total PM emissions in the EU-27



DIESEL MACHINE EMISSIONS

became more important as emissions from other sources, such as road vehicles, are reduced.



INCREASE
in the number
of diesel
machines in use



NO_x AND PM EMISSIONS
are dangerous for
human health and
the environment



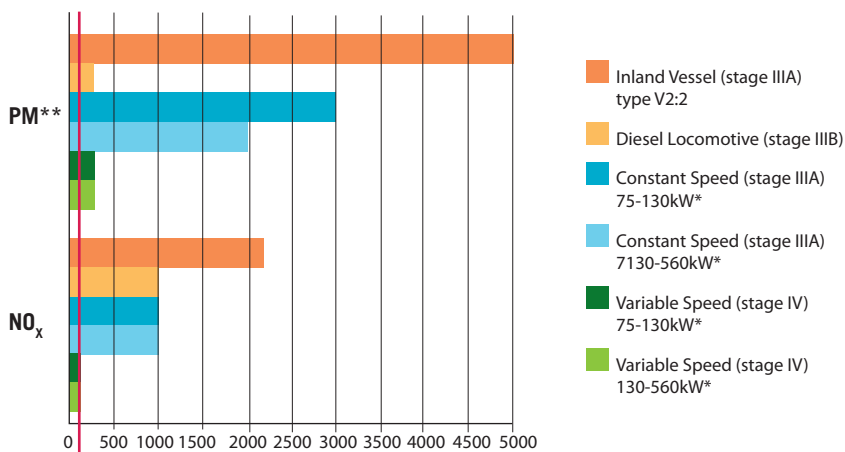
STANDARD FOR PARTICLES NUMBER

Particulate matter (PM) is the general term used for a mixture of airborne particles. They are classified according to their diameter. For example, PM₁₀ refers to PM with a diameter up to 10 micrometers (µm). The smaller, ultrafine particles (below 2.5µm) are the most dangerous as they can penetrate deep into the lungs, enter the bloodstream and even reach the brain.

Historically the EU has only set standards to reduce the weight of total PM from road and non road machinery emissions. Unsurprisingly, that approach led to manufacturers choosing the cheapest and easiest option of reducing the bigger PM while ignoring the smaller, more dangerous ones.

In order to properly account for ultrafine particles, the EU has also introduced particle number (PN) limits in the legislation for road vehicles, both for cars and vans (also known as 'light duty' vehicles) and for trucks and buses ('heavy duty' vehicles). PN limits do not currently exist in diesel machine legislation.

Comparison between heavy duty vehicles standards (Euro VI) and diesel machine standards



Euro VI emission limits * These standards are expected to be reviewed in the next revision of the Directive
 ** Euro VI limits on particulate matter include a PN limit value!

NATIONAL BEST PRACTICE

Some cities and countries are taking the lead in retrofitting diesel machines. Retrofitting involves installing devices such as diesel particulate filters (DPF) to old machines in order to cut down their emissions of pollutants and fulfil the newer and stricter emission limits.



- From 2014 all machinery used in public construction sites in Berlin should meet the requirements of Stage IIIB [2]. This requirement will oblige older construction machinery to be retrofitted in order to meet the stricter Stage IIIB emission limits.



- In Switzerland all construction machinery with an engine of more than 18 kW must be equipped with DPFs. Strict controls ensure compliance.

For footnotes, please refer to separate reference sheet and to the EEB website.

RECOMMENDATIONS

- Enlarge the scope of the legislation to cover machines currently excluded: diesel machines with engines above 560 kW and below 19 kW [3] and stationary engines (i.e. diesel generators, air conditioning engines).
- Introduce PN limits for all categories and align them with Euro VI.
- Align PM and NO_x emission limits with Euro VI.
- Remove flexibility and derogations. The transitional period before the entry into force of the new stage of emissions limits (Stage V) will provide manufacturers with ample time to comply with the new standards.
- Introduce in-service conformity for all machines, including those over 560 kW.
- Set stricter emissions limits from inland water vessels, locomotives and railway machinery. Their emissions limits should be consistent with their image as green transport systems.
- Address emissions from existing machines. They have a slow turnover rate meaning that if their emissions are not addressed they will continue to pollute for a long time.
- The EU should promote the application of UNECE standards across Europe. Member states should introduce retrofitting obligations for diesel machines used in their territory.
- Ensure compliance of real world driving emissions through regular controls by independent authorities.
- Adopt ambitious targets in the revised National Emissions Ceilings Directive. Emission reduction commitments must go beyond the Gothenburg Protocol and aim to achieve the health and environmental objectives of the EU's 6th and 7th Environment Action Programmes by 2030.

More information:

- Transport & Environment position on diesel machines
<http://www.transportenvironment.org/publications/tackling-emissions-diesel-machines>
- Soot Free Cities City Ranking
<http://sootfreecities.eu/measure/non-road-mobile>