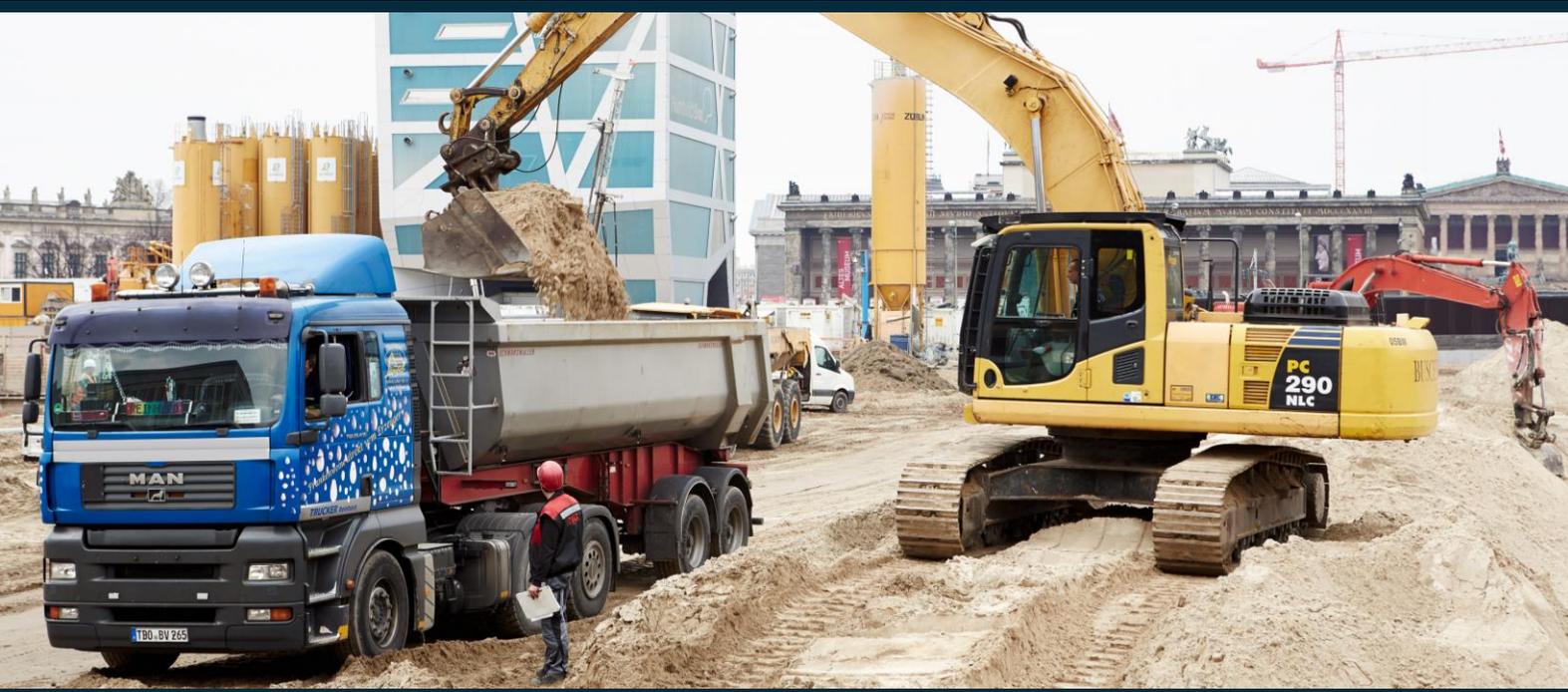


Guideline **CONSTRUCTION MACHINERY**



The multitude of mobile machines and gadgets operating with diesel engines are a considerable emission source of particulate matter (which includes among others superfine soot particles). Though those machines are small in total numbers and gather only low mileage, they are operated over many hours a day at the same place for a longer time. In construction sites as hotspots, they contribute considerably to high local pollutant concentrations. However, while road transport in Europe is already subject to many measures reducing harmful emissions, construction machinery emissions not been sufficiently regulated.

Installing emission reduction systems in construction machinery is of imminent importance, because the machinery is used for many hours and days at the same place and endangers the health of the construction workers as well as the people living around the construction sites. Here, EU wide emission limits for new machineries are absolutely necessary.

Nevertheless, construction machinery can also be effectively managed by cities because a part of the construction machinery works on sites commissioned by the municipalities themselves. In these cases, municipalities are able to decide directly what emission limits are set for the machinery used.



Potential

In comparison with heavy duty vehicles complying with EURO V/VI standards, construction machinery complying with IIIA standards emit up to 10 times more ultrafine particle emissions. And while the standard IIIB does reduce overall emissions of particulate matter (PM), machines complying with it often create smaller particles that are even more hazardous to health. Swiss numbers suggest that up to 1000 times more ultrafine particles are emitted from these machines.

For old machinery, only the installation of effective particulate filter systems does reduce particulates by the sufficient rate of up to 95%. These retrofits are not only absolutely necessary they are proven to be technically and economically feasible. Furthermore, particulate filters need to become mandatory for new machinery as well.

Legal regulations

That European limit value stages for construction machinery were not introduced until 1999 has also contributed to the disproportional share on the overall emissions.

For new engines, since 2012 limit values according to standard IIIB with a particulate mass limit of 0,025 g/kWh have gradually been

introduced. Since 2014 they have to comply with standard IV, however PM limits are not stricter and it only covers machines between 56 and 560 KW. Other countries are way ahead of the EU, already requiring particulate filters. Good examples are Japan, California and Switzerland.

Air pollution & Health

In 2010, more than 400,000 people died prematurely in the EU due to air pollution. That makes air pollution the main environmental cause for shortened lives in the EU. The resulting health problems cost society estimated 330€-940 billion per year. Over 90% of the urban population in the EU is exposed to concentrations higher than the limit values recommended by the World Health Organisation (WHO). Among the most important pollutants are black carbon (BC), which is a part of particulate matter (PM), Nitrogen Dioxide (NO₂) and ozone (O₃)

Today's legislation on exhaust emission standards for Non-Road Mobile Machinery (NRMM) is technically outdated and does not stipulate pollution control of exhaust gases inspections on a regular basis.

What needs to be done?

While EU limits and national regulation are preferable levels of regulation, already municipalities can act on the local level. The goal: Operating (construction) machinery has to be fitted with emission reduction technology.

Here we formulate what needs to be done to effectively reduce ultra-fine particulate emissions from construction machinery at the different policy levels:

At the European level

The revision of the guideline 97/68/EC of the European commission for the restriction of exhaust emissions of combustion engines for mobile machines and gadgets (Non-Road Mobile



Machinery (NRMM)) was already delayed by several years, but the European Commission has submitted its proposal in July/August 2014.

Crucial elements of the new NRMM regulation include:

- Additional parameter of “number of particles”.
- Ambitious limit values (similar to EURO VI limit values of heavy duty vehicles).
- Periodical exhaust inspections at adequate intervals is required regardless of the year of construction.

At the national level

- Limit values in low-emission zones can and must apply to construction machinery as well.
- Appropriate labelling of Construction Machinery, i.e. comparable to LEZ sticker systems.
- Immediate filter obligations in tenders for federal constructions sites

The Swiss example

Switzerland is considered as role model for other countries when combating particulate matter. To avoid health effects due to these particles, the Federal Environmental Agency (BAFU) of Switzerland passed an ordinance on protecting air quality on construction sites (known as BauRLL) which came into force on 1. September 2002.

In 2008, the air-pollution control regulation was nationally harmonised and from then on applied to all construction machines in Switzerland. The legislation limits the amount of particles with a value of 1×10^{12} particle/kWh solid matter particles with a diameter of 23nm in exhaust. It

also sets limit values for the particle mass. These limit values cover new as well as stock vehicles and consciously set a filter obligation for these machines.

At the local level

Several municipalities have already recognized construction machinery as important emission source. To achieve this, the municipalities will have to include particular conditions in public

Bremen

The German city of Bremen has decided to set emission limits for construction machinery used in all publicly tendered construction projects. Sadly, the city has not included a filter into the requirements for the machines.

tenders, construction planning & development plans and air quality regulations like air quality action plans etc.

Final Words

The Swizz example shows that already today it is possible to achieve emission reduction in construction machinery. In the EU, the NRMM directive needs to require particulate number as additional limit and a obligation for retrofit of particulate filters.

Regulation in the EU is slowed down by lobby efforts of construction industry and the fear of additional costs. Switzerland has shown that regulation on construction machinery is less of a burden than argued. Cities can already lead the way and require filters for municipal construction ten



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ABOUT US

Clean Air is a project by nine European environmental organisations that fight for clean air in European cities. Despite the existing legislative framework and the citizens' right to clean air, continuing violations of air pollution limits remain a problem in many cities. Air pollution threatens health, environment and climate. It's time to take action!

www.cleanair-europe.org

Started in 2009, the associated campaign "Sootfree for the Climate" aims to reduce diesel soot emissions, which accelerate climate change and pose a threat to public health. To this day twelve European NGOs have joined the campaign.

www.sootfreeclimate.org

a project by



project coordination

co-financed by the EU's LIFE financial instrument



associated campaign

