

# Retrofit of construction machines for public works in Berlin

## 6<sup>th</sup> VERT FORUM

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## Agenda

- Motivation of the project
- Definition of low emission construction machines
- Regulation | timeline | implementation
- Support for the companies

*Berlin*

## Motivation

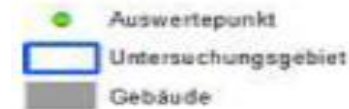
- The emission limits for non-road mobile machineries are behind the onroad legislation
- Berlin considers in urban environment the emission of construction machines as a significant contributor to air pollution – fine dust
- After implementation of the environmental zones in Berlin **apr. 142 tons** of soot are produced by the Heavy duty on road vehicles **instead of 255 tons before** the implementation
- Emissions of non-road mobile machineries like construction machines contribute 90 ... 170 ton to the air pollution – it is therefore comparable to onroad
- The emissions are considered more critical because they are emitted locally concentrated

## Motivation

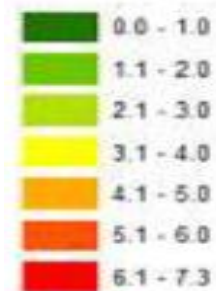
Kfz-Verkehr



Baustelle



Zusatzbelastung  
PM<sub>10</sub> in µg/m<sup>3</sup>



Effect at the edge of a construction area with 5 machines stage II, service 8am ... 4 pm;  
 Compared to apr. 46.500 vehicles per day with 1.800 trucks and busses

→ + 2 µg/m<sup>3</sup> more fine dust in annual average

→ + 10 days with exceeding the European 24h limit



## Motivation

- With the implementation of the environmental zones in Berlin apr. 15.000 heavy duty vehicles have been retrofitted between 2009 and 2012
- The implementation reduced alone for heavy duty vehicles the particle emissions by 40%
- Construction machines are not falling under this regulation
- Berlin decided therefore to make it mandatory to use low emission construction machines for construction areas under the responsibility of the public authorities

## ○ Definition of low emission construction machines

Power	Emission standards	Machines falling under the onroad homologation (heavy duty onroad standard)	Mobile equipment with constant engine speed
ab 19 kW und < 37 kW	Stufe IIIA <sup>1)</sup>	minimum Euro IV <sup>2)</sup>	Partide filter, first fit or retrofit
ab 37 kW und < 56 kW	Stufe IIIB <sup>1)</sup>		
ab 56 kW bis 560 kW	Stufe IIIB oder IV		

- Machines which don't apply have to be retrofitted with a diesel particulate filter

## ○ Construction machines excludes of the regulation

- Machines under 19 kW and more then 560 kW engine power are excluded
- Some machine types are excluded due to the small population and the low contribution to the emissions like asphalt boilers, pilling machines and others

## Implementation of the regulation

- The standards will be implemented in two steps according to the machine types
- First step: defined machine types from July 2015 on
- Second step: defined machine types from July 2016 on
- Only closed DPF systems are allowed for retrofit

Umweltstandards einzuhalten ab	Maschinenkategorie
01.07.2015	<ul style="list-style-type: none"> <li>■ Radlader, Baggerlader, Raupenlader, Kompaktlader, Teleskoplader, sonstige Lader</li> <li>■ Kompressoren und Generatoren</li> <li>■ Mörtelförderer und Verputzgeräte, Betonmischer und Beton-pumpen</li> <li>■ Pumpen zum Wassermanagement</li> <li>■ Unabhängig von der Maschinenkategorie: selbstfahrende Arbeitsmaschinen mit Typzulassung des Motors nach Richtlinie 88/77/ EWG (Abgasnorm für Lkw)</li> </ul>
01.07.2016	<ul style="list-style-type: none"> <li>■ Mobilbagger, Standbagger, Hydraulikbagger, Seilbagger, Schreitbagger, Minibagger, Kompaktbagger, Teleskopbagger, sonstige Bagger</li> <li>■ Dumper/ Muldenkipper</li> <li>■ Verdichtungsmaschinen</li> <li>■ Mörtelförderer und Verputzgeräte, Betonmischer und -pumpen</li> </ul>



## ○ Requirements for particle filters to retrofit

- Diesel particle filters have to be certified by minimum one of the following certifications
- Stage PMK 2 according „Anlage XXVII zur Straßen-verkehrs-Zulassungs-Ordnung (StVZO)“
- Class 1 or 2, reduction stage 01 of UNECE guideline No. 132 (REC-guideline)
- FAD Quality seal
- On VERT filter list and/or conformity according Swiss LRV (BAFU List)
- Machines which have been retrofitted to fulfill the requirements of TRGS 554.



## ○ Support for building and construction companies

- Guideline for retrofit of construction machines
  - Hotline for companies in Berlin
  - Website for the project
  - Information workshops
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- Find the official complete guideline „Umwelt und Beschaffung“ under:  
<http://www.stadtentwicklung.berlin.de/service/gesetzestexte/de/beschaffung/>  
or: [www.berlin.de/baumaschinen-partikelfilter](http://www.berlin.de/baumaschinen-partikelfilter)



Thanks you for your attention

*Berlin*