

## Executive summary

In "Directive 97/68/EC - Draft", the European Commission is proposing a next level, the so called Stage V, for the engine power range of 130 – 560 kW, and is planning for it to become mandatory by January 1st 2019.

OEMs - amongst them the European mobile crane manufacturers under the FEM umbrella - using such engines in their machines would have a 12 month period to adapt their machines to Stage V engines, followed by an additional 6 month sell-off period.



However, a one year transition period is impossible. Three years is the minimum.

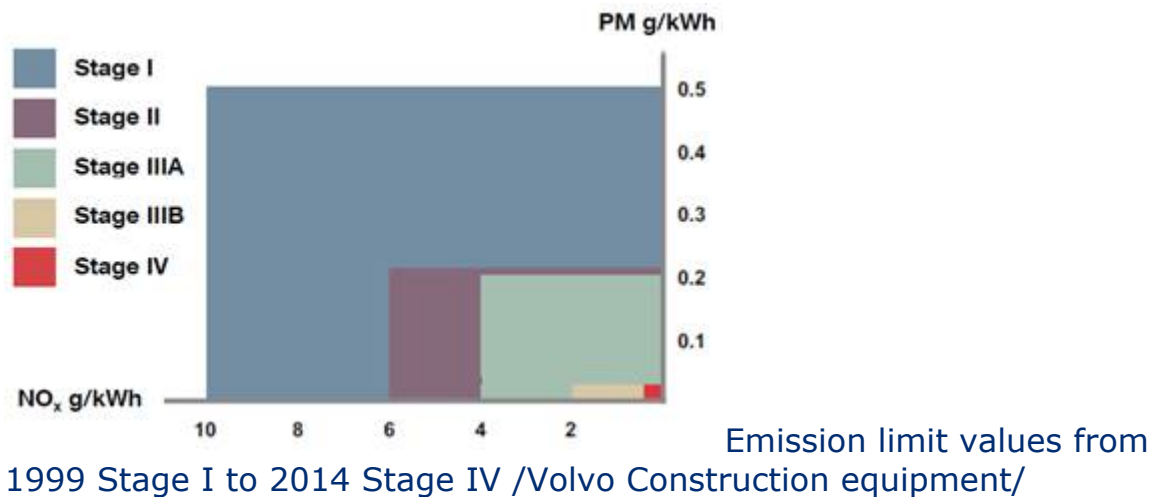
If the EU doesn't grant the crane manufacturers a three years transition period, it will also affect your business as mobile crane rental companies and users. There will be a shortage of new cranes, and you will be forced to let your cranes "live" longer, until all new cranes have been adopted to the stage V engine systems. This is most probably for you as crane owner an impossible situation, therefore allow me to suggest, that you, through your local legislative or organizational connections, put pressure through "the system" asking for an extension of the transition period from one to three years.

### **"Directive 97/68/EC - Draft" - Stage V diesel engines:**

During the most recent ESTA meeting the crane manufacturers under the FEM umbrella managed to get the undivided attention from the crane owners with news about the new stage V engine systems.

The dust has not yet settled on the recent introduction of Euromot Stage IV Diesel engines ( 97/68/EC Stage IV), before Brussels intends to make a next huge leap at a time where the mobile crane manufacturers are still in the last steps of completing the changes from Stage IIIB to Stage IV. The EU commission now proposes a next level, the so called Stage V, for the engine power range of 130 – 560 kW becoming mandatory by January 1st 2019. OEMs using such engines in their machines would have a 12 month period to adapt their machines to Stage V engines, followed by an additional 6 month sell-off period.

Although the emissions from Diesel engines have been reduced significantly over the course of the recent years (see picture below) the further reduction of diesel particulate emission is intended.



The manufacturers of mobile cranes in Europe organized in the FEM (European Association of Material Handling and Lifting Equipment Manufacturers) have tasked an independent body, The University of Munich, with a study to better understand the details of the impact of the proposed new regulation. Based upon data for AT crane models from OEMs Faun, Liebherr, Manitowoc and Terex the impact study was developed and can be downloaded in full from <http://www.fem-eur.com/index.php/news/en/nid=246/>

Up until now the OEMs spent in total 4,5 years to convert 42 AT crane models from Stage IIIA to IIIB and will have spent another 4,3 years to convert 38 AT crane models from Stage IIIB to Stage IV. These conversions employed up to 30% of R&D resources involving the lead engineers, not just only drafters. The conversions consumed investments of approximately 38 m€ (to Stage IIIB) and 57 m€ (to Stage IV).

Crane buyers may ask themselves why it requires such a huge effort in time and money – simply because it is not a 1:1 exchange. The engines get bigger and heavier and the additional equipment such as catalyst and specific exhaust systems turn the Diesel engine into an engine system. The possibilities to adapt such an engine system to the needs of a specific crane model are very limited, so the crane must be adapted to the engine system instead! In other words – changing the engine system requires changes in the engine bay to create room for the installation and requires changes to cope with changes in weight and center of gravity. This will start on the engine bay, e.g. the steelworks, but it may require significant changes to carrier, superstructure and even boom to re-balance the crane and its transport weights. For AT cranes it requires keeping the axle load limitations by design changes to enable homologation of the machine for travel on public roads. In other words, the changes on the mobile crane have to be re-homologated as the former permits are not valid anymore with the changes made.

*The results for the crane buyers are more complex and more costly*

*products, requiring fuel of a higher quality, requiring additives, technical issues with the new models when introduced, and , for the crane buyers - most importantly - delays of deliveries.*

Furthermore the world is now divided into regulated and non-regulated markets, which has significant impact to the freedom of movement of larger mobile cranes and impacts the residual value of the products as well. How would you sell a Stage IV model into a non-regulated market with fuel quality for a Stage IIIA engine?

By analyzing previous conversions the study from University of Munich demonstrates, that the proposed transition period of only one year for the conversion from Stage IV to Stage V cannot be matched – keeping in mind that the previous conversions with similar complexity exceeded 4 years.

Comparing the proposed short transition period of 1 year with an more acceptable period of 3 years, which the OEMs see as reasonable, it is demonstrated in the study , that the current proposal even increases the emissions for a period of approximately 5 years. This is why: If the OEMs need 3 years to convert, but get only 1 year, *the users will be forced to continue the use of older equipment being already on the market. After the transition period even the Stage IV engine cannot be placed on the market anymore but equipment already put onto the market can be used – older mobile cranes enjoy a grandfathering, or in other words: In many countries crane owners will be forced to let their old cranes undergo costly overhauls, so crane owners better start planning for this situation.*

The crane manufacturers must consider and find solutions how to manage production capacities and employees *when for a period of time 2/3rds of the products cannot legally be sold in Europe!*

Crane owners should keep in mind, that the introduction of Stage V will create 3 “worlds”, that is:

- a non-regulated market (Stage IIIA),
- a regulated market EU (Stage V) and
- as far as can be seen a regulated market maintaining Stage IV (e.g. in this case Tier 4f in the US).

*The consequences for movement of large mobile cranes when being used is unclear, but the consequences for the residual value after several years of service will most probably be significant.*

To add insult to injury, the study shows further, that with the current Stage IV engines, the particle emission from tyre wear is of the same magnitude as Diesel engine particle emissions! Particles from tyre wear and brake lining abrasion will become the dominant source of particle emission in the future.

As mentioned and discussed during the latest ESTA Section Cranes meeting, the crane manufacturers under the FEM umbrella is seeking exemption from the upcoming regulation but, as this probably not might be politically possible, they are asking for an adequate transition period – in the interest of the entyre mobile crane industry, and in the interest of the environment, to avoid emissions going up by applying a period being too short!

Allow me to suggest that all of you, through your local legislative or organizational connections, put pressure through "the system" asking for an extension of the transition period from one to three years.

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