

# CECE Economic Forum

17 October 2014, 9.30 am to 1pm  
Crowne Plaza, Antwerp



CECE Congress 2014 - 15, 16, 17 October - Antwerp, Belgium



# “Global Off-Highway Diesel Emissions Update”

Mike Osenga-Publisher, Diesel Progress  
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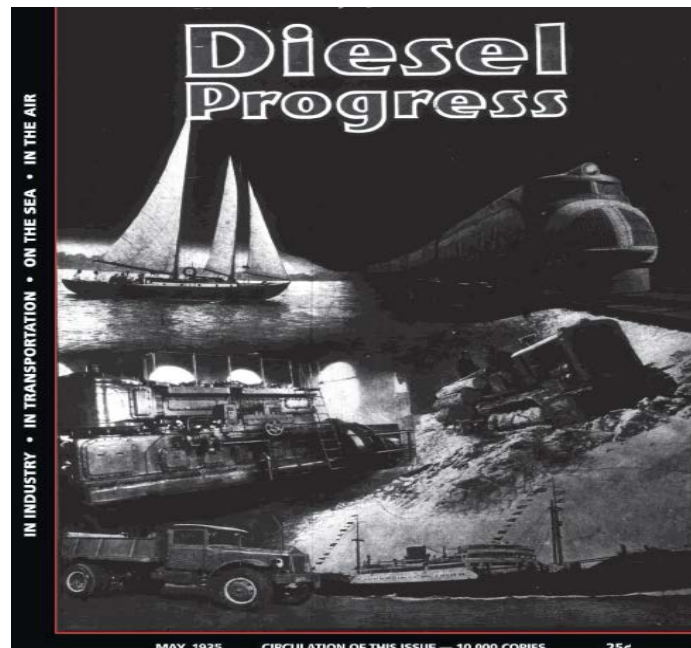
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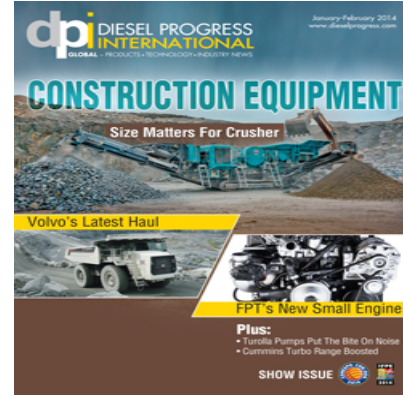
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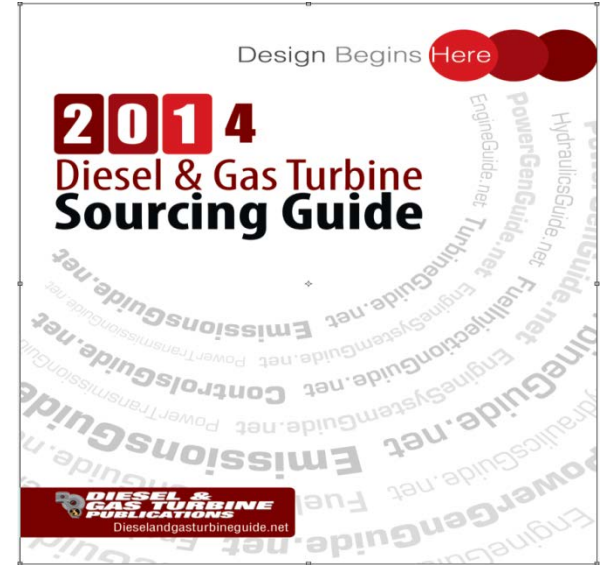
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# The Never Ending Cycle of Diesel Emissions

New legislative proposal –  
Limit values



Engines other than: SI Engines <math>\leq 56 \text{ kW} / \text{MW} / \text{Rail}</math> emissions in g/kWh			Limit values proposed					
			CO	NO <sub>x</sub>	HC	PM	PN	A
CI engine 5-8 kW	variable & constant speed		8	7.5	0.4/0.6	-	-	1.1
CI engine 8-19 kW	variable & constant speed		6.6	7.5	0.4	-		
CI engine 19-37 kW	variable & constant speed		5.0	4.7	0.015	$\times 10^{14}$		
CI engine 37-66 kW	variable & constant speed		5.0	4.7	0.015	$\times 10^{14}$		
Engines 66-130 kW	variable & constant speed		5.0	0.4	0.19	0.015	$\times 10^{14}$	
Engines 130-560 kW	variable & constant speed		3.5	0.4	0.19	0.015	$\times 10^{14}$	
Engines P >560 kW	variable speed		3.5	3.5	0.19	0.045	-	6.0
Engines P >560 kW	constant speed	other than pen-sets	3.5	3.5	0.19	0.045	-	
Engines P >560 kW	constant speed	pen-sets	3.5	0.67	0.19	0.035	-	

EMISSIONS NEWS

The European Commission has proposed new Stage 5 exhaust emissions rules for a broad range of nonroad diesel engines. The regulations will cover a broad range of engines from 10 to 560 kW and will include a particle count standard.

## THE NEXT STAGE IS LOOMING

European Commission's proposed Stage 5 off-highway emissions regulations put additional focus on particulate matter









# 2014 GLOBAL DIESEL EMISSIONS REGULATIONS

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# ***Diesel Emissions Today***

- An estimated 75% of the world is at Tier 3 or lower regulations
- Many countries are moving towards stricter off-highway diesel regulations, but the pace and commitment varies
- Many countries have no off-highway diesel regulations
- Will the standards that do exist actually be enforced?
- Will they be enforced equally for all manufacturers?
- Newer regulations, like Stage 5, will focus mostly on particulate matter
- More DPFs
- Further reduction NOx will stabilize EGR-SCR engine architecture
- There will likely be a Tier 5 in the U.S. *after* Stage 5



# What Happens With Used Equipment?

## INDUSTRY NEWS



Backhoe loaders such as this Caterpillar 420F are among the more common machines to migrate to lesser-regulated countries like Mexico.

## WHEN ENGINES AND MACHINES MIGRATE

Caterpillar develops its strategies for used Tier 4 interim equipment.

**W**hether you call it deteriorating or decertifying — it is a challenge, so now, the

Power Systems Div., Caterpillar, "Because Caterpillar serves customers in all markets, we develop prod-

ucts from their machines and commercial engine configurations, enabling them to be operated in lesser-regulated countries. The modification processes, which include the decertification of the engine, will be made available to customers in those countries through Cat dealers this year.

The company also said that its Tier 4 interim engine systems above 175 hp (7.1 through 32 L engines) would not require any modifications to operate in lesser-regulated countries.

Caterpillar introduced its first Tier 4 Interim products in February 2011. The population has grown to more than 82,000 machines in North America, Europe, Japan and Australia, the company said. These products have collected almost 42 million operating hours, which has proved their reliability and fuel efficiency, Caterpillar said, and created interest among used equipment purchasers worldwide.

According to Younessi, a key consideration for Caterpillar in developing its strategy for Tier 4 migration was to help ensure customers maintain the resale value of their used equipment. "We're looking forward, ahead of the Tier 4 Interim products that are already finding their way overseas to lesser-regulated countries," he said.

# *One Solution?*





# Questions About Used Equipment in Lower Regulated Markets

- Ultra low sulfur diesel (ULSD) fuel is the key
- ULSD is the enable of emissions systems
- Forecasts of ULSD availability vary very widely
- ULSD is more expensive—higher operating costs for emerging markets
- CLEAN fuel is a must—high pressure common rail fuel systems VERY intolerant of dirty fuel
- A concern for distributors and operators
- Opens the door for less costly lower technology machines?
- Latest Tier/Stages still new, migration has not begun in big volumes—but it will
- Most manufacturers have not yet announced “de-tiering” “de-certifying” strategies



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