

NEWS RELEASE

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Press Information

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MTU presents pioneering EPA Tier 4 final solutions at ConExpo show

- *Meeting emissions targets with even less fuel consumption*
- *Diesel engines from 135 to 4,020 bhp (100 to 3,000 kW)*
- *Debut for new generation of Series 2000 and Series 4000*
- *Tier 4i engines above 750 bhp (560 kW) without exhaust gas aftertreatment*

LAS VEGAS, 22 March 2011. At the ConExpo trade show, the Tognum subsidiary [MTU](#) showcases its pioneering solutions for the U.S. emissions stages EPA Tier 4 interim (Tier 4i) and Tier 4 final (Tier 4f). MTU features the line-up of C&I engines with the lowest fuel consumption figures across the entire power range from around 135 to 4,020 bhp (100 to 3,000 kW). In the power range up to 750 bhp (560 kW), that includes the Series 400, 500 and 900 for Tier 4i and the future Series 1000 to 1500 for Tier 4f. The Series 1600 engines for Tier 4f range from 760 to 980 bhp (567 to 730 kW). MTU debuts the new generation of Series 2000

and Series 4000 engines with power outputs up to 1,560 to 4,020 bhp (1,163 and 3,000 kW), respectively. The construction industry trade show takes place in Las Vegas from March 22 to 26 with MTU presenting its engine portfolio at booth S-17607.



“We are already in a position to show our U.S. customers our solutions for 2014 and those solutions not only meet the emissions targets, they do it with less fuel,” said Peter Kneipp, Tognum COO with responsibility for the business unit Engines, underlining the company’s technological expertise and its competitive edge. “That is a clear expression of our commitment to our C&I and mining business and for our customers it confirms our status as a solid and reliable partner over the long term.”

In the range up to 750 bhp (560 kW), MTU supplies EPA Tier 4i engines of **Series 400, 500 and 900** with Selective Catalytic Reduction (SCR). They are based on Mercedes-Benz commercial vehicle engines and succeed Detroit Diesel’s Series 60 engines. The SCR technology allows OEMs to convert their vehicles and equipment for 2011 emissions targets with the least possible outlay. This approach also brings additional benefits in the form of reduced fuel consumption up to 5%. A 6R 926 is on display at the show.

Beginning in 2014 [MTU](#) will introduce new Tier 4f engines of the **Series 1000, 1100, 1300 and 1500**. They will be equipped with exhaust gas recirculation, SCR units and diesel particulate filters. MTU’s development goal, however, is to fulfill Tier 4f without diesel particulate filters which would be a major advantage concerning space requirements and weight. A 6R 1300 and a 6R 1500 unit will be on display. MTU is thus one of the first engine manufacturers already able to present an entire engine family for Tier 4f below 750 bhp (560 kW), giving OEMs ample time to adapt their applications for the new engines. End customers benefit

from even further reduced fuel consumption up to 5% compared to the Tier 4i solutions, increased durability up to 20%, high torque at low engine speed, high engine exhaust brake performance as well as quick and easy maintenance.



Beginning in 2014, the future **Series 1600** engines extend the program up to 980 bhp (730 kW). These off-highway engines will be used for applications such as dump trucks, loaders, excavators, cranes and mining equipment. For the EPA Tier 4f requirements these engines will be equipped with in-engine exhaust gas recirculation technology and a diesel oxidation catalyst. MTU's development goal, however, is to fulfill Tier 4f without any aftertreatment equipment. In order to meet stringent emissions limits while also achieving lowest fuel consumption, MTU has placed particular emphasis on optimizing the combustion process. Overall, the customer benefits from an integrated system with low conversion and operating costs. On display is a 12V 1600 engine.

The new generation of **Series 2000** C&I engines for Tier 4i covers a power range from 752 to 1,560 bhp (561 to 1,163 kW) and fulfills the emissions limits using only in-engine technology and no exhaust gas aftertreatment. It powers, for example, harbor and mobile cranes, excavators, loaders and open-cast mining vehicles as well as drilling equipment and pumps. Despite the significant reduction in emissions limits, the new engines use up to 10% less fuel than their predecessors. In addition, they deliver constant power up to an altitude of 10,200 ft (3,100 meters) – which makes them the first in their class with this benefit to come onto the market. A larger performance map, higher torque by lower engine speed due to the two-stage turbocharger and the new common rail fuel injection system give the engine a better load acceptance. Life-cycle costs are also even lower than their predecessors' thanks not only to reduced fuel consumption but also to long overhaul intervals which can be up to 18,000 hours depending on load profile. The 12- and 16-cylinder versions of the engines will be introduced

onto the market in stages from mid-2011. Beginning in 2015, the Series 2000 will be available in a Tier 4f version. Even for this emissions stage MTU plans to fulfill the emissions limits using only in-engine technology.



Beginning in 2015, the new generation of the **Series 4000** engines for Tier 4 covers the 1,070 to 4,020 bhp (800 to 3,000 kW) power range with 8, 12, 16 and 20 cylinder versions. On customer request the new Tier 4i or Tier 4f compliant engines will be available even before 2015. It is mainly used in heavy mining vehicles, wheel loaders or excavators. The engines will consume up to 3% less fuel than today's Tier 2 engines, despite having to meet more stringent emissions regulations. Additionally, they will provide superior torque performance compared to their predecessors. Their performance remains constant up to 10,500 ft (3,200 meters) altitude without derate. MTU plans to fulfill the emissions limits using only in-engine technology.

MTU's role as a reliable partner for its customers is built not only on its products alone, but also on its **MTU ValueCare** program of services. This service portfolio is individually tailored to the customer's specifications, no matter what the requirements are. Among others, these include precision-tailored maintenance contracts, extended warranty coverage and the rapid and dependable provision of high-quality, original-brand spare parts which are developed and manufactured by MTU. Furthermore, MTU offers remanufacturing services. In this process for Series 2000 and Series 4000 engines, the units are given a complete examination based on a standardised procedure and are completely refurbished. For the MTU ValueCare program of services, MTU has over 1,200 service locations worldwide.

MTU product line-up for C&I applications



Power Range	Tier 3	Tier 4i	Tier 4f
135 - 350 bhp 100 - 260 kW	4R, 6R Series 900 (up to 240 kW/320 bhp)	4R, 6R Series 900 (2011) SCR (up to 240 kW/320 bhp)	4R, 6R Series 1000 (2014) EGR, SCR, DPF*
375 - 430 bhp 280 - 320 kW	6R Series 60 6R Series 460 6V Series 500	6R Series 460 (2011) 6V Series 500 (2011) SCR	6R Series 1100 (2014) EGR, SCR, DPF*
455 - 510 bhp 340 - 380 kW	6R Series 60 6R Series 460 (up to 360 kW/480 bhp)	6R Series 460 (2011) SCR (up to 360 kW/480 bhp)	6R Series 1300 (2014) EGR, SCR, DPF*
535 - 620 bhp 400 - 460 kW	6R Series 60 8V Series 500 (up to 480 kW/645 bhp)	8V Series 500 (2011) SCR (up to 480 kW/645 bhp)	6R Series 1500 (2014) EGR, SCR, DPF*
	Tier 2	Tier 4i	Tier 4f
750 - 980 bhp 560 - 730 kW	12V Series 2000	12V Series 2000 (2011) EGR	10V, 12V Series 1600 (2014) EGR, DOC**
750 - 1,560 bhp 560 - 1,160 kW	12V, 16V Series 2000 (up to 1,000 kW/ 1,340 bhp)	12V, 16V Series 2000 (2011) EGR	12V, 16V Series 2000 (2015) EGR, DPF*
1,070 - 4,020 bhp 800 - 3,000 kW	12V, 16V, 20V Series 4000	12V, 16V Series 4000 (on request) EGR	8V, 12V, 16V, 20V Series 4000 (2015) EGR, DPF*

* Development without diesel particulate filters (DPF) in progress

** Development without diesel oxidation catalyst (DOC) in progress

EGR: Exhaust Gas Recirculation

SCR: Selective Catalytic Reduction

DPF: Diesel Particulate Filter

DOC: Diesel Oxidation Catalyst

PHOTOS – Press photos can be downloaded from the Tognum website:

www.tognum.com/press

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About MTU

MTU Detroit Diesel, Inc. is the North American regional headquarters of MTU Friedrichshafen GmbH, one of the world's most important providers of diesel engines and drive and propulsion systems for ships, heavy-duty land and rail vehicles, and distributed energy. It offers a complete line of power solutions from 30 to 12,200 bhp (20 to 9,100 kW) for applications in the marine, rail, power generation, oil and gas, agriculture, mining, construction and industrial, and defense markets. MTU Detroit Diesel, Inc. is the sales and after-sales organization of the Tognum Group in North America.

www.mtu-online.com



Tognum

With its two business units, Engines and Onsite Energy & Components, the Tognum Group is one of the world's leading suppliers of engines and propulsion systems for off-highway applications and of distributed energy systems. These products are based on diesel engines with up to 9,100 kilowatts (kW) power output, gas engines up to 2,150 kW and gas turbines up to 45,000 kW.

The product portfolio of the Engines business unit comprises MTU engines and propulsion systems for ships, for heavy land, rail and defense vehicles and for the oil and gas industry. The portfolio of the Onsite Energy & Components business unit includes distributed energy systems of the brand MTU Onsite Energy and fuel-injection systems from L'Orange. The energy systems comprise diesel engines for emergency standby power, prime power and continuous power, as well as cogeneration power plants based on gas engines and gas turbines that generate both power and heat.

In 2009, Tognum generated revenue of €2.5 billion and employs more than 8,700 people. Tognum has a global manufacturing, distribution and service structure with 27 fully consolidated companies, more than 140 sales partners and over 500 authorized dealerships at approximately 1,200 locations. The shares of Tognum AG (ISIN: DE000A0N4P43) have been stock-exchange listed since 2007 and are included in the MDAX.