Heavy-Duty, On- and Off-Highway Engines 2019

Challenge: CO₂ limits

26.11. – 27.11.2019
Friedrichshafen, Germany

Visit to Rolls-Royce Power Systems, including a look at the new MTU microgrid
Challenge: CO₂ limits

/ NEW DIESEL, GAS AND DUAL-FUEL ENGINES
New large engines, components and concepts

/ POLLUTANT EMISSIONS
New concepts and solutions

/ REDUCING CO₂ EMISSIONS
Legislative requirements and potential solutions

Welcome

The increasingly stringent exhaust emission limits for diesel engines represent a major challenge for the manufacturers of large engines for mobile, stationary and maritime applications. One example of this is the agreement by the EU member states to reduce by 30% the CO₂ thresholds for trucks and buses from 2019 levels by 2030. For this reason the theme of this year’s annual MTZ Conference “Heavy-Duty, On- and Off-Highway Engines” is “The challenge of CO₂ limits”.

The key topics at the conference, which takes place on 26 and 27 November 2019 in Friedrichshafen, are new engines and concepts, improving the basic engine and reducing pollution. The event also includes a trade exhibition and a visit to the Rolls-Royce MTU plant. Don’t miss this opportunity to find out about the latest solutions, expand your network and make valuable contacts.

I look forward to welcoming you to the conference.

On behalf of the Scientific Advisory Board

KEYNOTE SPEAKERS

Dr. Heinz-Jürgen Büchner, IKB Deutsche Industriebank AG
Senior Executive, Ricardo UK Ltd
Dr. Achim Schaadt, Fraunhofer Institute for Solar Energy Systems

Stay at the cutting edge!

✓ Technical presentations from internationally renowned speakers
✓ Networking in the expert community
✓ Innovative products and services
Heavy-Duty, On- and Off-Highway Engines

Manufacturers of large engines and related components face mounting pressures: they are expected to meet rising demands for engine output, while also reducing fuel consumption, emissions and assembly space.

New concepts for engines, emissions reduction and drivetrain optimization are called for in order to overcome these challenges. Combining presentations, in-depth discussions and networking possibilities, the international MTZ Conference “Heavy-Duty, On- and Off-Highway Engines” offers you the ideal platform.

Scientific Advisory Board

Our Scientific Advisory Board, which is made up of prominent figures from the relevant field, provides support during the planning phase of the conference and helps to identify suitable topics. With its expertise the board has made a valuable contribution to the choice of themes for the lecture program.

Detlev Baudach
Tenneco GmbH

Rolf Brück
Continental Emitec GmbH

Dr. Heiner Bülte
DEUTZ AG

Bernd Danckert
ICCL Ltd.

Rudolf Ellensohn
Liebherr Machines Bulle S.A.

Dr. Alexander Heintzel
Editor-in-Chief ATZ I MTZ Group

Dr. Michael Krüger
Robert Bosch GmbH

Dr. Rainer J. Lehnen
Eberspächer Exhaust Technology GmbH & Co. KG

Dr. Andreas Lingens
Woodward L’Orange GmbH

Börge Nielsen
Daimler AG

Dr. Andreas Pfeifer
MAHLE GmbH

Prof. Dr. Gerhard Reiff
KST-Motorenversuch GmbH & Co. KG

Dr. Hans-Josef Schiffgens

Wolfgang Schröppel
MAN Truck & Bus SE

Andy Skipton-Carter
Ricardo UK Ltd

Dr. Martin Teigeler
Rolls-Royce Power Systems AG

Dr. Ioannis Vlaskos
Winterthur Gas & Diesel Ltd.

Prof. Dr. Georg Wachtmeister
Technical University of Munich

Dr. Wolfgang Warnecke
Shell Global Solutions (Deutschland) GmbH

Scientific Director of the Conference

Prof. Dr. Peter Eilts
Technical University of Braunschweig
### 08:45 Welcome and opening of the conference
Dr. Alexander Heintzel, Editor-in-Chief ATZ | MTZ Group

### 09:00 – 10:30 KEYNOTE LECTURES

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>09:00</td>
<td>Future challenges in the markets for offroad and heavy vehicle engines</td>
<td>Dr. Heinz-Jürgen Büchner, Managing Director Industrials, Automotive &amp; Services, IKB Deutsche Industriebank AG</td>
</tr>
<tr>
<td>09:30</td>
<td>A vision for the future (2035) portfolio of heavy-duty 'engines'</td>
<td>N. N., Senior Executive, Ricardo UK Ltd, UK</td>
</tr>
<tr>
<td>10:00</td>
<td>The role of synthetic fuels in an integrated energy system</td>
<td>Dr. Achim Schaadt, Head of Department Thermochemical Processes Hydrogen Technologies, Fraunhofer Institute for Solar Energy Systems (ISE) [in cooperation with ICCL Ltd., Cyprus]</td>
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### 10:30 Refreshment break with coffee and tea in the exhibition area

### 11:00 – 13:00 NEW ENGINES

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>11:00</td>
<td>MTU series 4000 for natural gas operation in ships – challenges for high-speed gas engines in mobile applications</td>
<td>Dr. Carsten Baumgarten, Director R&amp;D Gas Engines, MTU Friedrichshafen GmbH</td>
</tr>
<tr>
<td>11:30</td>
<td>DEUTZ engine portfolio below 56 kW to meet EU Stage V NRMM emission standard</td>
<td>Christian Opitz, Team Leader Thermodynamics Compact Engines, DEUTZ AG</td>
</tr>
<tr>
<td>12:00</td>
<td>Compact and powerful: the new 9-liter diesel engine from MAN for off-highway applications</td>
<td>Tobias Herrmann, Lead Engineer Validation Offroad Engines, MAN Truck &amp; Bus SE</td>
</tr>
<tr>
<td>12:30</td>
<td>Meeting IMO III / EPA tier 4 regulations – challenges and solutions from the view of a solution provider</td>
<td>Dominik Linder, Functional Team Leader Testing Series 4000 Marine, MTU Friedrichshafen GmbH</td>
</tr>
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### 13:00 Lunch in the exhibition area

### 14:15 – 15:45 EMISSIONS I

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<thead>
<tr>
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<tbody>
<tr>
<td>14:45</td>
<td>A novel low-cost aftertreatment solution for lean-burn gas engines</td>
<td>Dr. Matthew Keenan, Global Technical Expert – Exhaust Emissions, Ricardo UK Ltd, UK</td>
</tr>
<tr>
<td>15:15</td>
<td>CFD simulation of particle deposition in exhaust gas treatment systems</td>
<td>Dorian Holtz, Team Lead Advanced Particle Simulation, FVTR GmbH [in cooperation with Winterthur Gas &amp; Diesel Ltd., Switzerland]</td>
</tr>
</tbody>
</table>

### 15:45 Refreshment break with coffee and tea in the exhibition area

### 16:10 Visit to Rolls-Royce Power Systems, including a look at the new MTU microgrid

In the foyer of the Jean-Raebel Building at the headquarters of Rolls-Royce Power Systems, you will be welcomed by the CEO Andreas Schell. There you will be shown an exhibition that will give you an opportunity to learn more about the company’s Green and High-Tech programme and the latest MTU technological solutions.

The programme also includes the most recent development projects and a visit to the MTU Training Centre for an overview of the current engine portfolio. Finally, in the new Microgrid Validation Centre, you will experience how Rolls-Royce Power Systems supplies heat and power in an environmentally friendly and efficient manner at the location itself.

### 19:15 Networking dinner at Dornier Museum Friedrichshafen

Enjoy a pleasant evening and interesting conversations over dinner with colleagues and speakers.
## PROGRAM

### BASE ENGINE

**Moderation:** Dr. Hans-Josef Schiffgens

**08:30 – 09:00**

**Varniably honed cylinder liners, iron based cast pistons and variably coated piston rings as PCU system for friction loss and TCO reduction**

Dr. Daniel Hrdina, Head of PCU Technology, MAHLE GmbH

**09:00 – 09:30**

**Parameter study concerning the appearance of micron and submicron oil droplets on the piston, piston ring and cylinder liner surfaces during blow-by and the evaluation of countermeasures**

Magnus Lukas Lorenz, Engineer for Durability and Functional Testing HDEP and MDEG Engines, Daimler AG

**09:30 – 10:00**

**Use of virtual sensors in stress-related design and operation-specific prediction of service life**

Martin Diesch, Research Assistant Reliability Engineering, Institute of Machine Components (IMA), University of Stuttgart [in cooperation with MTU Friedrichshafen GmbH]

**10:00 – 12:00**

**Refreshment break with coffee and tea in the exhibition area**

### EMISSIONS II

**Moderation:** Dr. Heiner Bülte, Head of Performance and Emissions, DEUTZ AG

**10:30 – 11:00**

**Real-world emissions testing experience using PEMS, across construction, locomotive and waterborne applications**

Nick Molden, Founder & CEO, Emissions Analytics, UK

**11:00 – 11:30**

**Model-based injector deposit detection**

Michael Hinrichs, Product Engineer PhD, John Deere GmbH & Co. KG [in cooperation with TU Darmstadt]

**11:30 – 12:00**

**Potential and challenges of multiple injection strategies for maritime fuels in large engines**

Benjamin Stengel, Scientific Assistant, Chair of Piston Machines and Internal Combustion Engines (LKV), University of Rostock

**12:00**

**Lunch in the exhibition area**

### NEW CONCEPTS

**Moderation:** Börge Nielsen, Director Engine Design, Testing and R&D Platform Management, Daimler AG

**13:00 – 14:00**

**The recuperated split-cycle engine as a sustainable heavy-duty solution**

Nick Owen, Technical Director, Dolphin N2 Limited [in cooperation with University of Brighton; Ricardo UK Ltd, all UK]

**13:30 – 14:00**

**Potential of low pressure EGR in combination with electric turbocharging for heavy-duty applications**

Harsh Sankhla, Team Leader Diesel Powertrain, FEV Europe GmbH [in cooperation with FEV Group GmbH]

**14:00 – 14:30**

**Modern hybrid propulsion systems for rail and marine applications: environmental and customer benefits from optimized system integration of proven diesel technology with the latest electrical innovations**

Martin Urban, Vice President Modular System Integration, MTU Friedrichshafen GmbH

**14:30 – 16:00**

**Refreshment break with coffee and tea in the exhibition area**

### CO₂

**Moderation:** Dr. Andreas Lingens, President/CEO, Woodward L’Orange GmbH

**15:00 – 15:30**

**Achieving the proposed EU heavy-duty truck 2030 CO₂ legislation**

Önder Bulut, Senior Simulation Engineer, Ricardo Prague s.r.o, Czech Republic [in cooperation with Ricardo UK Ltd, UK]

**15:30 – 16:00**

**Reducing CO₂ emissions in heavy-duty engines with alternative fuels**

Paul Wang, Engineering Project Team Leader, Caterpillar Inc., USA

**16:00 – 16:30**

**Is methane the heavy-duty fuel of the future?**

Dr. Max Kofod, Fuel Scientist Technology Maturation & Future Portfolio, Shell Global Solutions (Deutschland) GmbH [in cooperation with Shell Projects & Technology, Netherlands]

**16:30**

**Closing remarks**

Dr. Alexander Heintzel, Editor-in-Chief ATZ I MTZ Group
Ricardo

With more than 3,000 employees, Ricardo is a leading research and development service provider of sustainable mobility and renewable energy with a clear focus on engine, driveline, and vehicle development. With our global headquarters based in the UK and technical centres and offices across USA, Europe and Asia we offer innovative technology and product development as well as delivering prototype manufacture and niche volume production.

In the field of heavy-duty and large engines, Ricardo has a wide range of experience from research up to support of series programmes. Ricardo provides low-emission, fuel-efficient, and powerful drive unit solutions for conventional and electrified powertrains and has also developed a wide range of solutions for exhaust aftertreatment to meet European, Japanese, and US legislation, and low-cost solutions for emerging markets.

Ricardo delivers concept development, simulation, design work, product development, application, and testing. Our test facilities include more than 30 modern industrial engine test beds for heavy-duty and large engines, battery, e-machine and powertrain testing enabling us to develop the next generation of low-emission and efficient powertrains for commercial vehicles for on- and off-highway, marine, rail, clean energy, and power generation applications and meet the standards for future emission and greenhouse gas legislation.

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The MTZ Conference “Heavy-Duty, On- and Off-Highway Engines” is aimed worldwide at experts from engine and vehicle manufacturers in the fields of commercial vehicles, off-highway and marine applications, stationary engines, suppliers and development partners, teaching staff and research assistants from universities, representatives of authorities and associations and engineers active in these fields.
Further Information and Online Registration:
www.atzlive.de/en/heavyduty

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The organizer

ATZlive / Spotlight on Powertrain and Vehicle Engineering

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Our close collaboration with the editorial teams of our specialist magazines ATZ and MTZ keeps us fully up-to-date on the latest topics and trends on the market.

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