

international **engine** 4th **Congress**

Meeting Place for the Engine Community

with accompanying trade exhibition

21 and 22 February 2017

Baden-Baden | Germany

Parallel lecture sessions on car and commercial vehicle engine technology and on new and alternative fuels

» Keynote Lectures



Prof. Dr. Jens Hadler
APL Group



Lars Mönch
German Environment
Agency



Dr. Andreas Schamel
Ford-Werke GmbH



Dr. Manfred Schuckert
Daimler AG



Lukas Walter
AVL List GmbH (A)



Dr. Michael Winkler
Hyundai Motor Europe
Technical Center GmbH

» Main Subject Areas

- Whole system combustion engine and fuels
- Engine concepts
- Combustion engines in electrified drives
- Methods
- Charge cycle and combustion
- Exhaust aftertreatment

» Panel Discussion

"Global mobility and sustainability — with how much combustion engine?"

ATZ live

VDI Wissensforum



www.ATZlive.com

international **engine** 4th congress

The combustion engine

WELCOME

The advancement of the combustion engine which is geared towards more fuel-efficiency and lower emissions, remains a key challenge. Going forward, the high energy density inherent in liquid fuels will contribute significantly to safeguarding the passenger vehicle's long-distance driving capability common today – also and in particular with a view to the commercial vehicle.

Therefore the 4th International Engine Congress places special emphasis on current trends in the drivetrain development, seen in the energetic overall system. Efficient passenger and commercial vehicle engines play a similarly crucial role as synthetic fuels, to achieve largely CO₂ neutral mobility that likewise accounts for the aspect of individuality when looking ahead.

Stay abreast of current trends and benefit from a lead in knowledge!

- You can expect international speakers as well as top-level presentations and panel discussions
- You can switch between lectures at any time, if you prefer to hear about another topic
- The congress is a great opportunity to “network” – the evening event for the engine community offers stimulating discussions in a pleasant, relaxing atmosphere
- The trade exhibition, held in parallel, provides ample information about innovative products and services in the field of combustion engine development

We look forward to your participation.

On behalf of the program advisory boards



Dr. Johannes Liebl
Scientific Director of the Congress,
Editor-in-Charge ATZ | MTZ | ATZelektronik

PARTICIPANTS

The event is primarily aimed at engineers and technicians in the industry or those involved in research and teaching, who are engaged in the optimization of the traditional developmental areas of the combustion engine or the advancement of procedures and systems to produce conventional or renewable fuels and lubricants. The lectures will be equally attractive for chemists and biologists who work in this industry. The focus will be on both Diesel as well as spark-ignition engines (gasoline/gas) for passenger and commercial vehicles and off-highway applications.

EVENING FOR THE ENGINE COMMUNITY AT THE KURHAUS CASINO BADEN-BADEN

As part of the International Engine Congress, we invite you to have dinner with other engine experts at the Kurhaus Casino Baden-Baden. You will have the opportunity to chat with colleagues, discuss the day's events and add to your network of contacts.

The Kurhaus Casino is located just a few minutes' walk from the congress venue. It is the city's main landmark and attracts thousands of visitors every year. Enjoy the excellent food and the historic atmosphere. The Kurhaus provides the ideal setting or the evening event of the Engine Congress for discussing the day's activities with the other congress participants.

ATZlive and VDI Wissensforum invite you to be their guest.



Simultaneous Interpreting
German -> English

ORGANIZERS

ATZ live

/// Spotlight on Powertrain and Vehicle Engineering ///

www.ATZlive.com

VDI Wissensforum

/// We develop engineers ///

www.vdi-wissensforum.de

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PROGRAM ADVISORY BOARD

» PASSENGER CAR ENGINE TECHNOLOGY



Dr. Johannes Liebl
Editor-in-Charge
ATZ | MTZ | ATZelektronik
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Chief Technology Officer,
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Automobil-Prüftechnik
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Adam Opel AG



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BMW AG



Dr. Uwe Mohr
Head of Central Research
and Advanced Development,
MAHLE International GmbH



Dr. Michael Winkler
Head of Powertrain,
Hyundai Motor Europe
Technical Center GmbH



Dr. Thomas Wintrich
Head of Diesel Engine Develop-
ment, Robert Bosch GmbH

» COMMERCIAL VEHICLE ENGINE TECHNOLOGY



Prof. Dr. Christian Beidl
Director of the Institute,
vkm, TU Darmstadt
CONFERENCE CHAIRMAN



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and Large Engines,
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Head of Performance &
Emission Development
HDEP, Daimler AG



Thomas Nickels
Senior Vice President
Engineering Powertrain,
MAN Truck & Bus AG



**Dr. Markus
Schwaderlapp**
Senior Vice President
Research & Development,
DEUTZ AG



Erik Versluis
Chief Engineer Engine
Development, DAF Trucks N.V.
(Intern. Advisory Board Member, NL)



Lukas Walter
Vice President Commercial
Powertrain Systems,
AVL List GmbH (A)

» NEW AND ALTERNATIVE FUELS



Wolfgang Maus
Managing Director,
WM Engineering &
Consulting GmbH
CHAIRMAN



Dietmar Goericke
Managing Director,
FVV e.V.



Prof. Dr. Jens Hadler
Managing Director, APL
Automobil-Prüftechnik
Landau GmbH



Prof. Dr. Georg Wachtmeister
Ordinary, Chair of Internal
Combustion Engines, TU Munich



Dr. Wolfgang Warnecke
Chief Scientist Mobility,
Shell Global Solutions
(Deutschland) GmbH



Dr. Werner Willems
Technical Specialist
Powertrain Combustion Systems,
Ford Forschungszentrum
Aachen GmbH

Tuesday, 21 February 2017

11:00 Coffee break
13:15 Lunch
16:15 Coffee break

09:15

Welcome and opening of the congress

Dr. Alexander Heintzel, Editor-in-Chief ATZ | MTZ Group, and **Anne Bieler-Bultmann**, Project Leader, VDI Wissensforum GmbH

Introduction to the program of lectures

Dr. Johannes Liebl, Scientific Director of the Congress, **Prof. Dr. Christian Beidl**, Conference Chairman Commercial Vehicle Engines Technology, and **Wolfgang Maus**, Chairman of the Program New and Alternative Fuels

 **Moderation:** **Dr. Johannes Liebl**, ATZ | MTZ | ATZelektronik

Propulsion for 2025



- Emission legislation in Europe
 - Forecast analysis for electrification in Europe
 - Hyundai and Kia electrified vehicles in Europe
- Dr. Michael Winkler**, Head of Powertrain, Hyundai Motor Europe Technical Center GmbH

Worldwide harmonization of emission regulations – a dream never becomes reality?



- Worldwide overview of current emission requirements for heavy-duty vehicles
 - Potential of harmonization of emission requirements
 - Outlook on future requirements
- Dr. Manfred Schuckert**, Head of Automotive Regulatory Strategy, Commercial Vehicles – Emission and Safety, Daimler AG

09:30

Auditorium (Basement)

Renewable energy supply of transport – possible?



- Renewable energy supply of transport
 - Land, sea and air traffic
- Lars Mönch**, Head of Section, Co-author: Dr. Martin Lange, both German Environment Agency

10:30

11:45

parallel sessions

11:45



PC engine technology 1
Engine concepts

11:45



PC engine technology 2
Systems and methods

11:45



Fuels
Current fuel concepts

11:45



CV engine technology
Emissions and exhaust aftertreatment

14:45



PC engine technology 1
Charge exchange and combustion I

14:45



PC engine technology 2
Emissions

14:45



Fuels
Alternative fuel concepts

14:45



CV engine technology
Charge exchange and combustion

PANEL DISCUSSION "Global mobility and sustainability – with how much combustion engine?"

17:00

Auditorium (Basement)



Prof. Dr. Peter Gutzmer
Deputy CEO,
Chief Technology Officer,
Schaeffler AG



Wolfgang Maus
Managing Director,
WM Engineering &
Consulting GmbH



Prof. Dr. Stefan Pischinger
President & CEO,
FEV Group Holding GmbH



Dr. Andreas Schamel
Director Global Powertrain
Research & Advanced
Engineering,
Ford-Werke GmbH



N.N.
Iveco

 **Moderation:** **Dr. Alexander Heintzel**, Editor-in-Chief ATZ | MTZ Group and **Dr. Johannes Liebl**, Editor-in-Chief ATZ | MTZ | ATZelektronik

19:30

Evening for the engine community



We invite you to have dinner with other engine experts at the Kurhaus Casino Baden-Baden.

You will have the opportunity to chat with colleagues, discuss the day's events and expand your network of contacts.










18:00

End of the first day of the congress

Wednesday, 22 February 2017

09:00

parallel sessions

09:00  PC engine technology Electrification concepts	09:00  Fuels Sustainable fuels concepts	09:00  CV engine technology Thermal Management
11:00  PC engine technology Charge exchange and combustion II	11:00  Fuels Fuels for day after tomorrow	11:00  CV engine technology Electrification
13:30  PC engine technology 48 volts in series production	13:30  Fuels Future use of fuels	13:30  CV engine technology New engines

 **Moderation:** Dr. Johannes Liebl, ATZ | MTZ | ATZelektronik

Auditorium (Basement)

The impact of an increasing electrification on the future of internal combustion engines



15:00

- Diversity of drives
- Electrification
- New fuels, e.g. OME

Dr. Andreas Schamel, Director Global Powertrain Research & Advanced Engineering, Ford-Werke GmbH

Impact of CO₂ and ultra-low NO_x legislation on the base engine



15:30

- Future legislation requires further CO₂ and NO_x reduction
- Technologies to increase the thermal efficiency of the engine
- Implement more degrees of freedom while further optimizing the main parameters of the engine

Lukas Walter, Vice President Commercial Powertrain Systems, Co-authors: Thomas Wagner, Gernot Hasenbichler, Helmut Theißl, all AVL List GmbH, Austria

Fuel: a key element for the mobility of tomorrow



16:00

- What has so far been achieved in the field of fuels?
- From today's viewpoint: what characteristics should tailored fuels have?
- Importance of fuel when choosing tomorrow's powertrain

Prof. Dr. Jens Hadler, Managing Director, APL Group,
Co-authors: Dr. Wolfgang Warnecke, Shell Global Solutions (Deutschland) GmbH,
Wolfgang Maus, WM Engineering & Consulting GmbH

During the breaks you have the opportunity to visit the exhibition!

16:30

Outlook and concluding remarks

Dr. Alexander Heintzel, Editor-in-Chief ATZ | MTZ Group, and **Anne Bieler-Bultmann**, Project Leader, VDI Wissensforum GmbH

to the parallel sessions



Tuesday, 21 February 2017

PC engine technology 1

Auditorium (Basement)



ENGINE CONCEPTS

Moderation: Prof. Dr. Uwe Dieter Grebe, AVL List GmbH (A)

11:45

CNG as ideal supplement to e-traction aiming at CO₂ neutral mobility?

- CNG mobility to supplement e-mobility aiming at CO₂ neutrality
 - Improved sustainability of CNG mobility by using regenerative admixture
 - Success factor is the alliance between politics, gas and automotive industry
- Dr. Wolfgang Demmelbauer-Ebner**, Head of Gasoline Engine Development,
Co-authors: Dr. Jens Andersen, Volkswagen AG, Reiner Mangold, Audi AG

12:15

Challenges posed by high performance combustion engines of the future taking the example of Porsche Boxer engines

- Porsche brand philosophy "Tradition and Innovation" in line with future requirements
- Conceptual advantages and disadvantages
- Potentials in combustion processes, exhaust gas aftertreatment, mechanics, fuels and electrification

Thomas Wasserbäch, Director Development Boxer Engines,

Co-authors: Jörg Kerner, Markus Baumann, all Dr. Ing. h.c. F. Porsche AG

12:45

Cylinder load point shifting in Diesel engines: potentials in passenger and commercial vehicles

- Shift of internal load
- Cylinder deactivation, engine concept, 3+1 and 4+2 cylinder operation
- Consumption and emission potentials, thermal management in the exhaust gas system

Jörg Neugärtner, Scientific Assistant, Chair of Combustion Machines,

Co-authors: Alexander Scholz, Anton Schurr, Prof. Dr. Rudolf Flierl, all Technical University of Kaiserslautern



CHARGE EXCHANGE AND COMBUSTION I

Moderation: Prof. Dr. Helmut Eichlseder, TU Graz (A)

14:45

Combination of variable compression and early intake valve closing: basis for high efficiency gasoline engines of the future

- Combination with the Miller-Cycle
- Long stroke engine layout as a basis for high geometrical compression ratio

Marc Sens, Senior Vice President Thermodynamics / Powertrain Concepts,

Co-authors: Michael Günther, Jan Müller, Sascha Nicklitzsch, Dr. Ulrich Walther, all IAV GmbH

15:15

Extremely lean gasoline technology – best efficiency and low emissions

- High efficiency powertrains
- Lean gasoline engine combustion
- Emission reduction

Dr. Philipp Adomeit, Executive Engineer Thermodynamics, Co-authors:

Dr. Johannes Scharf, Dr. Matthias Thewes, Dr. Bastian Morcinkowski, all FEV GmbH

15:45

From hot tube to corona ignition

- Challenges and opportunities for the ignition system of future gasoline engines
- Ignition innovations
- Combustion processes and transient as well as implementation-relevant aspects

Dr. Joachim Hahn, Head of Design V-Engine / Special Engine,

Co-authors: Dr. Martin Schenk, Dr. Christina Sauer, Dr. Franz Xaver Schauer, all BMW AG

PC engine technology 2

Sitzungsraum 1 (1st Floor)



SYSTEMS AND METHODS

Moderation: Prof. Dr. Jens Hadler, APL Automobil-Prüftechnik Landau GmbH

11:45

Cold start behavior of circuit variants of a rankine heat recovery system

- Experimental analyses and exhaust waste heat
- Impact on the combustion engine

Thomas Matousek, Scientific Assistant, Co-authors: Frank Stahl, Prof. Dr. Thomas Koch, all Institute for Piston Machines, Karlsruhe Institute of Technology, Michael Bens, KIT Campus Transfer GmbH

12:15

Method for the predictive calculation of mixed friction

- Tribological optimization tool to minimise friction
- Predictive calculation based on the energetic method
- Characteristic maps on: operating conditions, surfaces, materials and lubricant

Morten Kronstedt, Team Manager Design and Simulation,

Co-authors: Prof. Dr. Jens Hadler, Christian Lensch-Franzen, Dr. Tahsin Doğuer, all APL Automobil-Prüftechnik Landau GmbH

12:45

Predictive diagnostic solutions beyond Big Data

- Basis for new service models to increase availability
- System components, know-how of new algorithms, data analysis and virtual models
- Modular approach aimed at the expansion of telematics solutions

Dr. Walter Lehle, Director, Co-author: Dr. Michael Hackner, both Robert Bosch GmbH



EMISSIONS

Moderation: Achim Königstein, Adam Opel AG

14:45

Development of soot sensors using multiphysics simulation models

- Frontloading in development
- Particulate matter sensors in Diesel engines

Dr. Wolfgang Schleifenbaum, Simulation Engineer, Virtual Engineering – Models and Simulation, Co-authors: Dr. Martin Eckardt, Dr. Christoph Gmelin, all Robert Bosch GmbH

15:15

Optimized heat release rate for enhanced thermal efficiency

- NO_x, noise and peak firing pressure constraints in light-duty Diesel engines
- Numerical optimization
- Combustion shaping and advanced methodology combining a DoE approach and a two-zone combustion model

Dr. Jean-Marc Zaccardi, Research and Innovation Engineer, Powertrain and Vehicle

Division, Co-authors: Gaetano De Paola, Jordan Rudloff, Frédéric Nicolas, all IFP Energies Nouvelles, France

15:45

Impact analysis of fuels and operating fluids and combustion parameters: focus raw emission behavior

- Methodology to reduce raw emissions of RDE
- Interactions between oil and fuel
- Reduction of particle emission

Christian Lensch-Franzen, Head of Engineering, Co-authors: Prof. Dr. Jens Hadler, Dr. Marcus Gohl, Tobias Mink, all APL Automobil-Prüftechnik Landau GmbH



11:00 Coffee break

13:15 Lunch

16:15 Coffee break

New and alternative fuels

Forum (Ground Floor)



CURRENT FUEL CONCEPTS

Moderation: Wolfgang Maus, WM Engineering & Consulting GmbH

11:45

Today's alternative fuels for tomorrow's sustainable mobility

- Overview of today's alternative fuels
- Impact on tomorrow's sustainable drive concepts

Dr. Werner Willems, Technical Specialist for Combustion Process Development,
Co-authors: Heiko Maas, both Ford Research and Innovation Center Aachen GmbH,
Dr. Ulrich Kramer, Ford-Werke GmbH

12:15

Natural gas-Diesel dual-fuel for commercial vehicle engines

- Potentials and limitations of combustion process with respect to emissions and fuel consumption
- Optimization of dual-fuel combustion processes
- Measurement results

Dr. Christian Barba, Director CV Engines Combustion Design,
Co-Authors: Dr. Jan Dyckmans, Dr. Jürgen Förster, Thomas Schnekenburger,
all Robert Bosch GmbH

12:45

Liquid and gaseous fuels from natural gas

- Overview on NG resources and availability
- Natural gas can power mobility in different ways as CNG, LNG and GTL
- Natural gas can be used to produce hydrogen or electricity as fuel for fuel-cell electric or battery-electric vehicles

Dr. Karsten Wilbrand, Innovation Manager Alternatives, Co-authors: Dr. Max Kofod,
Dr. Christoph Balzer, all Shell Global Solutions (Deutschland) GmbH



ALTERNATIVE CONCEPTS

Moderation: Dietmar Goericke, FVV e.V.

14:45

Energy chains and drive systems in the comparison of efficiency taking into account the air quality

- Power-to-Liquid processes and synthetic fuels
- Energy conversion chains
- Emission behavior (local/global)

Prof. Dr. Kurt Kirsten, Head of Predevelopment, APL Automobil-Prüftechnik Landau GmbH,
Co-authors: Patrick Schmidt, Werner Weindorf, both Ludwig-Bölkow-Systemtechnik GmbH

15:15

Potentials of sustainable bio Diesel fuels to achieve mobility

- Raw materials and volume potentials
- Climate effect
- New technologies

Dr. Ralf Türck, Managing Director, Tecosol GmbH

15:45

Alternative fuels for commercial vehicles

- Current situation for commercial vehicles
- Diversification of fuel supply
- Fundamental considerations and key issues

Patrik Klintbom, Director, Combustion Powertrain, Volvo Group Trucks Technology, Sweden

CV engine technology

Kongress-Saal I (1st Floor)



EMISSIONS AND EXHAUST AFTERTREATMENT

Moderation: Prof. Dr. Christian Beidl, TU Darmstadt

11:45

Challenges posed by an exhaust gas aftertreatment system for Stage V with SCR-F

- European emission legislation Stage V for off-road engines
- Compact exhaust gas aftertreatment system with SCR-F
- Tailor-made exhaust gas aftertreatment system for engines without EGR

Evangelos Katsaounis, Leader ATS Development & Validation, Co-authors: Peter Krähenbühl,
Raphael Hertach, Ralph Wachter, all FPT Motorenforschung AG, Switzerland

12:15

Highly integrated exhaust gas aftertreatment systems in heavy-duty applications

- Requirements towards on- and off-road heavy-duty exhaust gas aftertreatment systems
- Conflict of objectives: Recovery behavior and nitrogen oxide turnover with SCR-coated Diesel particulate filters
- System layout and operating strategy

Dr. Stephan Schraml, Senior Manager Predevelopment Exhaust Aftertreatment,
Co-authors: Dr. Dieter Rothe, Florian Lutz, Frank Ingo Zuther, all MAN Truck & Bus AG

12:45

Advancement of the "EGR only" approach for industrial engines

- Transient control of low pressure EGR
- Diesel 3000 bar injection system
- NRTC cycle within Stage V, emission limit w/o NO_x exhaust gas aftertreatment

Dirk Queck, EMS Development Engineer, Co-Authors: Dr. Olaf Erik Herrmann,
both DENSO Automotive Deutschland GmbH, Cristian Capituppi, Kohler Co.,
Prof. Federico Mollo, Politecnico di Torino, both Italy



CHARGE EXCHANGE AND COMBUSTION

Moderation: Lukas Walter, AVL List GmbH (A)

14:45

Thermodynamic potential for further efficiency increase of Diesel engine combustion in the heavy-duty vehicle engine

- Focus on increasing engine efficiency levels and CO₂ reduction
- Turbocharging seen as key technology for optimization
- Studies looking at 3D flow and combustion calculation validated against engine test bench results

Gernot Graf, Manager Development Commercial Engines, Co-authors: Helmut Theißl,
Hans-Felix Seitz, Alexander Machold, all AVL List GmbH, Austria

15:15

Improving commercial vehicle emissions and fuel economy with engine thermal management using variable valve actuation

James McCarthy, Jr., Engineering Manager, Eaton – Vehicle Group, USA,
Co-authors: Helmut Theißl, Lukas Walter, both AVL List GmbH, Austria

15:45

In-house developed turbochargers as key technology element for the development of Daimler heavy-duty engines

- The turbocharging system of current engine series
- Impeller service life prediction based on measured load cycles
- ATL-aerodynamics dimensioning by means of consumption characteristic maps and load spectrum

Michael Wöhr, Development Engineer – Truck Turbo Charger, Co-authors: Dr. Markus Müller,
Thorsten Fögeling, Johannes Leweux, all Daimler AG

Presentations

parallel sessions

Wednesday, 22 February 2017



Breaks

10:30 Coffee break

12:00 Lunch

14:30 Coffee break

PC engine technology

Auditorium (Basement)



ELECTRIFICATION CONCEPTS

Moderation: Dr. Uwe Mohr, MAHLE International GmbH

09:00

Development of a 48V mild hybrid concept for passenger Diesel engines

- Emission and consumption reduction by means of 48V E-charger and belt-driven starter generator
- Layout of a 48V mild hybrid concept
- Energy management in dual voltage vehicle wiring systems

Dr. Joschka Schaub, Teamleader Function Development, Co-authors: Bernd Lindemann, both FEV GmbH, Philip Griefnow, RWTH Aachen University, Sebastien Potteau, Valeo S. A., France

09:30

The tailored powertrain for 48V

- Options for the gasoline engine – Chance for future Diesel powertrains
- Where is the position of the E-motor?
- Solutions for compact class and SUV

Dr. Helfried Sorger, Executive Chief Engineer Powertrain Design, Simulation and Mechanical Development, Co-authors: Dr. Wolfgang Schöffmann, Michael Weißback, Mario Brunner, all AVL List GmbH, Austria

10:00

Optimal hybrid gasoline engine – solutions for complex powertrains

- Requirements for integrated hybrid gasoline engines
- Engine concepts, fuel saving potentials and costs
- Impact and interaction of engine concepts on the powertrain system

Christoph Danzer, Development Engineer Powertrain Systems / synthesis, Co-authors: Mark Vallon, G. Albrecht, Wolfgang Wukisiewitsch, all IAV GmbH



CHARGE EXCHANGE AND COMBUSTION II

Moderation: Dr. Christian Landert, BMW AG

11:00

Model-based combustion chamber layout for passenger vehicle Diesel engines

- Model-based combustion chamber design applying the method of design of experiments
- Optimizing variation parameters using response surface methods
- Layout of a quiescent Diesel combustion process using 3D CFD segment simulation for passenger vehicle engines

Alexander Machold, Lead Engineer, Co-authors: Ludwig Bürgler, Andreas Ennemoser, Markus Grubmüller, all AVL List GmbH, Austria

11:30

Target figures and parameters in the combustion process development

- Combustion stability as driver to achieve high efficiency
- Target-based layout of inlet port, piston and injection
- Correlation between TKE and burn rate

Dr. Stephan-Johannes Schnorpfeil, System Technology Engineer – Combustion, Co-authors: Dr. Elias Baum, Benedikt Fuchs, all Adam Opel AG



48 VOLTS IN SERIES PRODUCTION

Moderation: Dr. Norbert Alt, FEV GmbH

13:30

48V in series application

- Driver for a 48V power grid in the vehicle
- Current versions of the 48V power grid and implemented customer functions
- Strategic outlook: requirements and challenges the 2nd generation 48V power grid has to face

Jens Kötz, Head of Electronics, Co-author: Siegfried Pint, both Audi AG

14:00

48V: Series solution and strategy

Dr. Richard Pothin, Senior Manager EV/HEV System, Co-author: Patrice Habert, both Technocentre Renault, France



SUSTAINABLE FUELS CONCEPTS

Moderation: Dr. Wolfgang Warnecke, Shell Global Solutions (Deutschland) GmbH

09:00

Latest findings with the soot-free fuel OME

- Soot-free combustion at lowest raw emissions of NO_x using EGR
 - Potential of injection system optimization for OME
 - New levels of freedom for the development of CI-combustion engines
- Dominik Pélerin**, Scientific Assistant, Co-authors: Kai Gaukel, Dr. Martin Härtl, Prof. Dr. Georg Wachtmeister, all Chair of Internal Combustion Engines, Technical University of Munich

09:30

Oxygenate fuel in the Diesel engine – Is a Diesel engine capable of Lambda 1?

- Load control concept on a single-cylinder research engine based on high EGR rates
 - Emission and temperature evaluation in the stoichiometric engine operation
 - Assessing the potential of a three-way catalytic converter in the context described
- Markus Münz**, Scientific Assistant, Co-authors: David Töpfer, Prof. Dr. Christian Beidl, all Institute for Internal Combustion Engines and Powertrain Systems, Technical University of Darmstadt

10:00

Production of fuels from hydropower and carbon dioxide from organic waste in Norway

- Process description of gasoline production from water power and organic waste carbon dioxide
 - Economy and carbon footprint of the process
 - Impact on engine technology
- Torsten Buddenberg**, Head of Product Development, Co-authors: Dr. Christian Bergins, both Mitsubishi Hitachi Power Systems Europe GmbH, Stephan Schmidt, Chemieranlagenbau Chemnitz GmbH, Dr. Hans-Jörg Fell, Hydrogen-Pro. Ltd., Norway



FUELS FOR DAY AFTER TOMORROW

Moderation: Dr. Werner Willems, Ford Forschungszentrum Aachen GmbH

11:00

Green hydrogen and downstream synthesis products – electricity-based fuels for the transportation sector

- Hydrogen production based on electrolysis
 - Utilization of electricity from fluctuating renewable sources
 - Chemical synthesis of liquid and gaseous fuels
- Dr. Alexander Tremel**, Principal Key Expert, Siemens AG

11:30

Current developments of CO₂ capture from the air

- Temperature-pressure swing adsorption to capture CO₂ from the air
 - Current prototypes and products
 - Market applications
- Dr. Jan Wurzbacher**, Managing Director, Climeworks AG, Switzerland



FUTURE USE OF FUELS

Moderation: Prof. Dr. Georg Wachtmeister, TU Munich

13:30

Sustainable designer fuels for Diesel and Otto fuels

- Non fossil liquid fuels
 - Chemical energy conversion
 - Use of sustainable energies for mobility
- Prof. Dr. Robert Schlögl**, Director MPJ, Fritz Haber Institute of Max Planck Society

14:00

A pragmatic approach to deep reduction in U.S. CO₂ emissions

- Climate change
 - Carbon trading
 - Renewable energy
- Dr. Mike Tamor**, Technical Leader Energy Systems and Sustainability, Ford Motor Company, USA



THERMAL MANAGEMENT

Moderation: Dr. Peter Heuser, FEV GmbH

09:00

Efficiency increase of the CV engine with a WHR turbine expander combined with 48V vehicle wiring system

- Reduction of fuel consumption through waste heat recovery
 - Single stage axial impulse turbine with partial admission
 - 48V high speed generator
- Rolf Müller**, Project Leader, Co-authors: Holger Oechsten, Sebastian Ewert, Thomas Schmidt, all MAHLE International GmbH

09:30

Organic rankine cycle turbine expander design, development and 48V mild hybrid system integration

- ORC cycle analysis and system matching to heavy-duty commercial vehicle
 - Turbine expander/generator design, development and testing
 - Integration of ORC waste heat recovery system into 48V mild hybrid architecture
- Frederick Huscher**, Senior Project Engineer, BorgWarner Turbo Systems, USA

10:00

Fuel saving potential of indirect charge air cooling for trucks

- Comparison of direct and indirect cooling system
 - Test results from engine and chassis
 - Opportunities to integrate further cooling tasks in the system
- Rainer Lutz**, Project Leader, Co-authors: Laurent Art, David Haar, all MAHLE Behr GmbH & Co. KG



ELECTRIFICATION

Moderation: Dr. Markus Schwaderlapp, DEUTZ AG

11:00

Range extender systems for electric drivetrains in medium-duty distribution vehicles

- Requirements on future distribution vehicle powertrains in urban traffic
 - Evaluation of electric powertrains and usage of range extender
 - Investigation of different range extender solutions and evaluation with respect to efficiency, package and costs
- Dr. Dirk Bergmann**, Vice President Commercial Engines, Co-authors: Stefano Ghetti, Dr. Edoardo Pietro Morra, all FEV GmbH, Johannes Maiterth, RWTH Aachen University

11:30

Development of a Diesel Power Module (DPM) for electrification of the last mile

- Entry into hybridization of E-locs
 - System development of a Diesel / electric power unit
- Thomas Praxmarer**, Head of Development, Co-author: Michael Aschaber, both STEYR MOTORS GmbH, Austria



NEW ENGINES

Moderation: Thomas Nickels, MAN Truck & Bus AG

13:30

The new Diesel and gas-engine family for the lower performance range

- Industrial engines Diesel / gas
 - 3- / 4-cylinder
 - Complete engine development
- Dr. Markus Schwaderlapp**, Senior Vice President Research and Development, Co-authors: Wilhelm Feuser, Kai Tedsen, all DEUTZ AG

14:00

The 2nd generation of Daimler's 10.7l heavy-duty engine for global on- and off-highway applications

- Impetus for further development – fuel efficiency, performance increase, OBD C
 - Innovative EGR valve
 - Exhaust thermal management with asymmetric injection
- Marco Ernst**, Performance and Emissions Development HD Engines, Co-authors: Jens Kleffel, David Koch, all Daimler AG

ACCOMPANYING EXHIBITION

SPONSOR 2017



EXHIBITORS 2017 (Updated October 18, 2016)

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- KST-Motorenversuch GmbH & Co. KG
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EXHIBITORS 2016

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If you would like to make contact with prominent congress participants and present your products and services effectively to a selected specialist audience, then you should become involved in the congress as an exhibitor or sponsor. This industry-meeting place gives you the ideal opportunity to take part in technical discussions with the participants and to make new contacts within the industry. We offer individual sponsorship and exhibition packages tailored to your specific needs. Take your pick from a variety of options.

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VDI Wissensforum GmbH
Isabelle Springfield
Project Manager Exhibitions and Sponsorship
+49 211 6214-429
springfeld@vdi.de

WHO SHOULD BECOME AN EXHIBITOR

The exhibition provides the ideal presentation platform for companies that supply components for internal combustion engines or that develop and optimize engines and engine parts. These include suppliers of components, systems and modules for Diesel and gasoline engines, companies that produce measuring and testing equipment and development service providers.



With Event App
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from early February 2017
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VENUE

Kongresshaus Baden-Baden
Augustaplatz 10 | 76530 Baden-Baden | Germany
Phone +49 7221 304-0
www.kongresshaus.de

HOTELS

Various hotels in Baden-Baden – all centrally located – have room blocks at reduced rates for participants. Here is just a small selection:

Here is a small selection:

Dorint Maison Messmer Baden-Baden (****)
Werderstraße 1 | 76530 Baden-Baden
Phone +49 7221 3012-0
<http://hotel-baden-baden.dorint.com/de>
€ 149,- Standard Single Room
€ 199,- Standard Double Room

Atlantic Parkhotel (****)
Hirschstraße 1 | 76530 Baden-Baden
Phone +49 7221 939-0
<http://www.atlantic-parkhotel.de/>
€ 149,- City-side Single Room
€ 159,- Park-side Single Room
€ 229,- City-side Double Room
€ 269,- Park-side Double Room

Der Kleine Prinz (****)
Lichtentaler Straße 36 | 76530 Baden-Baden
Phone +49 7221 34 66 00
<http://www.derkleineprinz.de/home>
€ 135,- Classic Single Room
€ 180,- Classic Double Room

Hotel Magnetberg
Scheibenstr. 18 | 76530 Baden-Baden
Phone +49 7221 364-0
<http://www.hotel-magnetberg.de/>
€ 85,- Standard Single Room
€ 95,- Standard Double Room

Hotel Löhr (***)
Lichtentaler Straße 19 | 76530 Baden-Baden
Phone +49 7221 302775
<http://www.hotel-loehr.com/>
€ 63,- Standard Single Room
€ 93,- Standard Double Room
€ 85,- Double Room for one person

The room prices given above include breakfast and VAT. Visitor's tax may be charged.

The complete list of hotels can be found on the event home page at www.ATZlive.de and www.motorenkongress.de.

Please reserve rooms by 24 January 2017 at the latest.
Booking reference: "International Engine Congress 2017"

If you have any questions on hotel bookings, please contact:

Baden-Baden Kur & Tourismus GmbH
Adelheid Ey
Phone +49 7221 275271
ey@baden-baden.com

REGISTRATION FEE

Passenger car engine technology or Commercial vehicle engine technology
€ 1.380,- excl. VAT
€ 1.280,- excl. VAT for VDI members

This includes the congress documents, coffee breaks, drinks, two lunches and the evening event. Participants may move between different lectures at any time.

Mode of payment

By bank transfer after receipt of an invoice or by credit card (MasterCard, Visa).
Participants with a billing address outside Germany, Austria and Switzerland are requested to pay by credit card.

TERMS AND CONDITIONS

No cancellation charge is due if registration is canceled by 23 January 2017. Cancellations made after that date will incur a charge of 35 % of the registration fee. For cancellations made after 30 January 2017 the full registration fee is payable. Cancellations must be made in writing. The date of the postmark will determine whether the deadline has been met. If you are unable to attend, we will be happy to accept a substitute participant.

Should a speaker be unable to attend at short notice because of force majeure, illness, accident or other circumstances for which ATZlive and VDI Wissensforum cannot be held responsible, another qualified person will be appointed to the exclusion of any claim for compensation. Should the event be canceled altogether, we will of course refund the registration fee.

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4th International Engine Congress — with accompanying trade exhibition

21 and 22 February 2017 | Baden-Baden | Germany

REGISTRATION

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Abraham-Lincoln-Straße 46
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I hereby register for the congress. I agree to the terms and conditions and accept that my registration is binding.

Registration data

Family name

First name

Acad. Titel

Company / Institute

Department

Function

Street / P.O. Box

Postal code / City

Country

Phone, Fax

E-Mail

Invoice address (if different from above address)

Vat No.

CS001027

Date, Signature

Registration fee

Passenger car engine technology

☐ € 1.380,-*

☐ € 1.280,-* for VDI members

or Commercial vehicle engine technology

☐ € 1.380,-*

☐ € 1.280,-* for VDI members

VDI membership number

* Excl. VAT

Participation in the evening event on 21 February 2017

☐ yes

☐ no

I am interested in exhibition and sponsoring opportunities

☐ yes

☐ no

Mode of payment

Participants with a billing address outside Germany, Austria and Switzerland are requested to pay by credit card.

Bank transfer after invoice

☐

Credit card

☐ MasterCard

☐ Visa

Card holder

Card number

Card security code

Credit card valid until

You will receive confirmation of participation upon receipt of your registration and be invoiced three weeks before the congress. You will receive your congress documents when registering at the venue. Please register one person per form only.

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