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**8 December 2020 08:00**

Morning coffee and tea with your peers

How do you like your coffee or tea?

Join our morning coffee and tea video session to connect with your peers in a relaxed atmosphere.

Your easy way to meet the delegates, make new contacts from the start, exchange thoughts and expectations.

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**8 December 2020 08:30**

Take your coffee and tea to a tour through our digital CTI SYMPOSIUM EXPO

Find out which products and solutions our partner offer for your business challenges.

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**8 December 2020 09:00**

Welcome address by CTI and the chairman of the CTI SYMPOSIUM



**Prof. Dr Ferit Küçükay**

Director of the Institute of Automotive Engineering,  
Technische Universität Braunschweig,  
Germany

## PLENARY SPEECHES

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**8 December 2020 09:15**

| PLENARY SPEECH

Electrified heavy-duty transport from the perspective of research and industry

- Market demand
- Technology
- Charging network



**Claas Bracklo**

Senior Consultant Electromobility,  
German Association of the Automotive  
Industry (VDA), Germany



**Dr Patrick Plötz**

Head of Business Unit Energy  
Economics  
Fraunhofer Institute for Systems and  
Innovation Research (ISI), Germany

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**8 December 2020 09:45**

| PLENARY SPEECH

Challenges in system-oriented design of electric drives

- Electrical machine design with strong system view
- Electrical machine design for autonomous vehicles
- Holistic design approach for electrical machines in automotive systems



**Prof. Dr Markus Henke**

Managing Director Institute for  
Electrical Machines, Traction and Drives,  
TU Braunschweig, Germany

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**8 December 2020 10:15**

Networking Coffee Break

**Connect with your `Best Matches`**

Find out who is your `best match` and if this is your new top business partner!

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**8 December 2020 10:45**

| PLENARY SPEECH

Is there a paradigm shift in drivetrain technology? - Trends and expectations with

and without Corona!

- Requirements of mobility versus public discussions
- Emissions and immissions, CO<sub>2</sub> as most important regulatory
- Status of current legislation, development of EURO7, CO<sub>2</sub> targets 2025 and 2030
- Outlook on long-term legislation, drive options and their evaluation
- Outlook on other markets



**Prof. Dr Thomas Koch**

Head of the Institute for Combustion Engines,  
Karlsruhe Institute of Technology (KIT),  
Germany

## EXPERT DISCUSSION

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8 December 2020 11:15

The new reality after Corona – global view on drive systems and emissions



**Ulrich Walter**  
Moderator



**Toshihiro Hirai**  
Senior Vice President  
Nissan Motor Co., Ltd, Japan



**Dr Joachim Damasky**  
Managing Director Technology and Environment  
Verband der Automobilindustrie e.V.  
(VDA), Germany  
Meet the experts  
Prolong the discussion with the experts and peers after the panel discussion!



**Stefan v. Schuckmann**  
Executive Vice President, Division Car  
Powertrain Technology  
ZF Friedrichshafen AG, Germany

8 December 2020 12:00

Networking Lunch

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**8 December 2020 12:45**

## **PARALLEL SESSIONS**

### **HEV Drives and Transmissions**

**12:45**

#### **Upgrading of 9G-TRONIC of Mercedes-Benz**

- Modular electrification of the 9G-TRONIC
- Structure, integration and features
- Transmission family: "art" module kit

**Marcus Sommer**, Project Manager Automatic Transmission, Mercedes-Benz AG, Germany

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**12:45**

| ADDITIONAL PRESENTATION PARALLEL TO SESSION

#### **Improving Performance in Electrified Powertrain with PEEK Polymers**

- Tribological performance in high-speed bearings
- Optimising NVH characteristics in HEVs/BEVs
- Advanced electrical insulation enabling improved thermal management and efficiency in e-motors

**Harvey Haworth**, Partner Account Manager Automotive, Victrex

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**01:15**

#### **Hybrid solutions for stepped planetary automatic transmissions**

- P2 solutions for RWD transmissions
- P1 / P2 solutions for FWD transmissions

**Chris Shamie**, Vice President, Hybrid Drives, eAxles, PMO, Schaeffler Group, USA

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**01:15**

| ADDITIONAL PRESENTATION PARALLEL TO SESSION

**Smalley Solves New E-Drive Application Challenges: Space Limitations and High RPM**

- Utilizing Compact Wave Springs to Save Space
- Designing with Self-Locking Spiral Retaining Rings

**Nicolas Peridy**, Senior Sales Engineer, Smalley

**Marc Jandard**, Sales Engineer, Smalley

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**01:45**

**Coffee Break**

**Business Speed Networking:**

Grab your pot of coffee and join in.

Meet peers by chance during a series of 3 min. video calls.

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**02:15**

**Scaling the functionality of a DCT-based DHT to segment-specific requirements – the new high torque DHTplus**

- the new DHTplus considering segment-specific requirements
- further functionalities for higher vehicle segments
- detailed solutions for best possible efficiency and performance

**Dr Sebastian Idler**, Engineering Project Leader, Transmission Systems, Magna Powertrain, Germany

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**02:45**

**Development of new CVT for global compact car**

- Introduction
- Development goals: Setting target value and scope of application
- Main technologies : New CVT belt pulley, etc
- Conclusion

**Yoshifumi Murakami**, Development Engineer, Honda R&D Co., Ltd, Japan

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**02:45**

| ADDITIONAL PRESENTATION PARALLEL TO SESSION

**Development of an EV / REEV / DHT product family**

**Sven Steinwascher**, Managing Director / CTO, GETEC Getriebe Technik GmbH,  
Germany

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**03:15**

**Break and visit to the digital CTI SYMPOSIUM EXPO, change to the plenum**

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**E-Drives I & Formula E**

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**12:45**

**Test result high speed electric drive unit for the next generation**

- High speed e-motor
- High speed transmission
- Dual SiC inverter
- Test results

**Mathias Deiml**, Department Manager, AVL Software and Functions GmbH,  
Germany

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**12:45**

| ADDITIONAL PRESENTATION PARALLEL TO SESSION

**Thermal and design aspects of a tightly integrated electric axle**

**Joris Bronckaers**, Systems Engineer, Punch Powertrain

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**01:15**

**Volvo Cars modular electric propulsion architecture**

- BEV architecture
- Modularity
- Efficiency

**Ahmet Dzafic**, Volvo Cars

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**01:45**

**Coffee Break**

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**02:15**

| IMPULSE LECTURE

### **The Compact Dynamics Race to Road Strategy**

- Compact Dynamics at Glance
- The Race to Road Strategy
- Examples of Implementation

**Oliver Blamberger**, CEO, Compact Dynamics, Germany

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**02:30**

| EXPERT DISCUSSION

### **Formula E and its impact on e-mobility**



#### **Gerd Mäuser**

Chairman,  
Jaguar Racing, UK



#### **Oliver Blamberger**

Managing Director,  
Compact Dynamics, Germany



#### **Lucas Di Grassi**

FIA Formula E World Champion, and  
Member of the Board,  
Roborace, UK



#### **Prof. Dr Peter Gutzmer**

(Moderator)  
pegu mobility consult

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**03:15**

**Break and visit to the digital CTI SYMPOSIUM EXPO, change to the plenum**

Commercial drives

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**12:45**

**New high-efficient wide spread AMT gearbox generation from Scania**

- High efficient AMT
- Wide ratio spread AMT to enable low rev cruising and high startability
- Wide ratio spread reverse gears
- Variable oil level system

**Per Arnelöf**, Expert Engineer, Scania CV AB, Sweden

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**01:15**

#### **Transmission and driveline for future trucks**

- Commercial vehicle powertrain architecture evolution with increasing electrification
- Hybrid commercial vehicle considerations and powertrain architectures
- Purely electrically propelled commercial vehicle considerations and powertrain architectures

**Rob Parkinson**, Global Technical Expert, Ricardo, UK

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**01:45**

#### **Coffee Break**

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**02:15**

#### **Torque converter electric drive unit for light commercial vehicles**

- Electric commercial vehicle drivetrain with high launch performance
- Torque converter for electric drivetrains
- Compact oil cooled electric drive unit with high thermal robustness

**Peter Janssen**, Director Business Line EDU, FEV Group GmbH, Germany

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**02:45**

#### **Driving strategy and simulation of a e-axle**

- Strategies for multi mode e-axes
- Simulation and optimization of driving strategies
- Predictive energy management for electric vehicles

**Felix Bayer**, System Engineer Onroad, AVL Commercial Driveline and Tractor Engineering GmbH, Austria



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**03:15**

**Break and visit to the digital CTI SYMPOSIUM EXPO, change to the plenum**

AWD and E-AWD

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**12:45**

**GKN's high efficient components for future AWDs**

- System analysis and main parameters of AWD components losses
- Efficient optimization approach
- Reduced fuel consumption through optimized AWD drivetrain

**Jan Haupt**, Advanced Engineering Manager, GKN Automotive, Germany

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**01:15**

**The disconnect-differential: A low cost - high impact all-wheel-drive (AWD) disconnect system**

- Bevel gear differential with integrated decoupling mechanism
- Improvements in efficiency for all types of AWD vehicles
- Incorporation of additional functions in existing parts

**Martin Bloder**, Student Assistant, Graz University of Technology, Austria

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**01:45**

**Coffee Break**

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**02:15**

**Stability analysis of AWD vehicle for start on low road**

- Subjective feeling analysis of vehicle dynamics
- Development of measurement method for driveline behavior
- Driveline stiffness design for comfortable subjective feeling

**Junji Ute**, Project Assistant Manager, SOKEN Inc.

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**02:45**

**48V P4 system**

- Hybrid electric all wheel driving capability with CO2 savings
- Mild hybrid eAWD benefits
- Development process of choosing the right design for eAWD

**Tua Högnäs**, Acting Manager for xEV EU, BorgWarner Sweden AB

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**03:15**

**Break and visit to the digital CTI SYMPOSIUM EXPO, change to the plenum**

Shift elements

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**12:45**

**Innovative shift elements**

- For electric and hybrid drivetrains
- Low drag losses and high actuation energy efficiency
- Integrated overload protection

**Tobias Skubacz**, Development Engineer, Diehl Metall Stiftung & Co. KG, Germany

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**01:15**

**Conical shifting element for decoupling clutches in P2 hybrid transmissions**

- Concept: TorqueLINE Twin Cone
- Application: Decoupling clutch for P2 hybrid transmissions
- HC320: High-performance friction lining, for efficient conical clutches

**Andreas Dempfle**, Development Engineer, HOERBIGER Antriebstechnik Holding GmbH, Germany

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**01:45**

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**02:15**

**Increasing the efficiency of shiftable clutches for electric high-speed transmissions with drive speeds up to 30,000rpm**

- Consortium project "Higspeed Clutch"
- Realization of a controllable clutch for high speed drives
- Reduction of drag losses and actuation energy
- Test bench results of drag torque and clutch dynamics

**Hüseyin Gürbüz**, Research assistant, IPEK, Mubea Tellerfedern GmbH, Kaco GmbH+Co.KG and Miba Frictec GmbH, Germany

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**02:15**

| ADDITIONAL PRESENTATION PARALLEL TO SESSION

**High speed / high load bearings from performance polymers**

**Michel Magdelyns**, Technical Director, High3P GmbH – High Performance Polymer Parts

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**02:45**

**2-speed seamless shifting for EV using magnetostrictive torque sensor**

- Introduction of our seamless 2-speed e-Axle concept
- Concept of seamless shifting with torque sensor
- Functionality of developed electric shift actuator
- Experimental validation with 2-speed gearbox

**Shohei Kaneko**, Engineer, NSK Ltd., Japan

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**03:15**

**Break and visit to the digital CTI SYMPOSIUM EXPO, change to the plenum**

Oils and lubrications

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**12:45**

**NextGen fuel economy fluids for single and multi-speed eDrives**

- Lubricants for HEVs and BEVs

**Patrick Bauer**, Senior Development Technologist, BP Europa SE, Germany

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**01:15**

## 2nd generation EDU fluids – new properties and ways to determine the performance

- New test methods for lubricants in electrical drive units
- New test rig to determine cooling efficiency and electric efficiency of oil cooled e-motors
- Presentation of prototypal fluid for oil cooled EDU

**Dr Peter Kraneburg**, Head Automotive Fluid Technology, Petronas Lubricants International, Italy

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**01:45**

### Coffee Break

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**02:15**

### **Lubricants solutions for combined fluid cycles for the lubrication and thermal management of BEVs**

- The ideal composition of Lubricants for battery cars
- Thermal management for battery cars
- Challenges for the unified fluid

**Christopher Dobrowolski**, E-Fluids Coordinator, Shell Lubricants Technology, Shell Global Solutions Deutschland GmbH, Germany

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**02:45**

### **E-mobility fluids for high performance hybrid and BEV applications**

- Lubricants with added friction performance
- E-mobility applications using limited slip differentials and torque vectoring systems
- Plus new generation of e-mobility lubricants for hybrid and BEV vehicles equipped with beveloid / hypoid drives

**Thomas Kraft**, Business Development Manager E-Mobility, Fuchs Schmierstoffe GmbH, Germany

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**02:45**

| ADDITIONAL PRESENTATION PARALLEL TO SESSION

## Mobil EV hydrocarbon thermal management fluids for BEV

- Dielectric hydrocarbon-based fluids for cooling energized componentry
- Cooling performance while maximizing energy efficiency
- Reduction of thermal runaway propagation

**Dr. Heinrich Braun**, European Product Technology Centre – Driveline & Electric Vehicle Fluids Technology Lead, ExxonMobil, Germany,

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**03:15**

**Break and visit to the digital CTI SYMPOSIUM EXPO, change to the plenum**

## PLENARY SPEECHES

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**8 December 2020 03:30**

| PLENARY SPEECH

Magna's view on the changing role of the powertrain in LCVs and PVs

- Market and energy forecasts – reliability vs. volatility
- How unexpected developments change the rules of the game
- Which powertrains prevail from a lifecycle perspective?
- The shift to 'intelligent' powertrains – risks and opportunities for the industry
- Future requirements for interchangeable functional modules



**Tom Rucker**

President,  
Magna Powertrain

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**8 December 2020 04:00**

After work networking hour

Still like to chat with your peers? Have your preferred drink at hand and meet the participants in a video meeting room.

Exchange thoughts and opinions in a relaxed atmosphere.

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**9 December 2020 08:00**

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**Prof. Dr Ferit Küçükay**

Director of the Institute of Automotive Engineering,  
Technische Universität Braunschweig,  
Germany

## PLENARY SPEECHES

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**9 December 2020 09:15**

| PLENARY SPEECH

MAHLE's contribution to the defossilisation of the transport sector

- Shaping future mobility with a wide range of efficient powertrain technologies



## Dr Jörg Stratmann

Chairman of the Management Board  
and CEO,  
MAHLE Group, Germany

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9 December 2020 09:45

| PLENARY SPEECH

Commercial vehicles with fuel cell drivetrain for heavy duty long-haul

- Entire vehicle concept
- Dimensions of drivetrain components and main specification vehicle
- Main components of the drivetrain (FCS, HTS, HV-batter, e-powertrain)



## Roland Dold

Truck Product Engineering – TP/VEP  
Daimler AG, Germany

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9 December 2020 10:15

Networking Coffee Break

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9 December 2020 10:45

| PLENARY SPEECH

The future of hydrogen as an energy carrier and its application in vehicles



**Dr Wolfgang Warnecke**  
Chief Scientist Mobility,  
Shell Global Solutions, Germany

## EXPERT DISCUSSION

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9 December 2020 11:15

H2 vs. BEV – Which technology is future proof?



**Ulrich Walter**  
Moderator



**Dr Stephan Herbst**  
Technical General Manager Hydrogen,  
Toyota Motor Europe, Belgium



**Konstantin Neiß**  
Director R&D Transmissions & eDrives,  
Daimler AG, Germany



**Felix Horch**  
Head of Department Electromobility,  
Fraunhofer Institute for Manufacturing  
Technology and Applied Materials  
Research (IFAM), Germany

Meet the experts

Prolong the discussion with the experts and peers after the panel discussion!

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9 December 2020 12:00

Networking Lunch

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## Parallel Sessions

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### Hydrogen from Production to Vehicle Application

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12:45

#### H2 as a renewable fuel option for mobility

- Outlook on hydrogen demand for 2030
- Hydrogen supply chain options
- Efficiency and cost of different hydrogen production and distribution pathways
- Hydrogen for heavy duty trucks
- Outlook for hydrogen as a multi-purpose molecule for de-fossilisation of the energy system

**Karsten Wilbrand**, Senior Principal Scientist Mobility, Shell, Germany

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01:15

#### The role of hydrogen and electrification towards Zero Emission Mobility

**Dr Stephan Herbst**, Technical General Manager Hydrogen, Toyota Motor Europe, Belgium

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01:45

#### Coffee Break

##### **Business Speed Networking:**

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02:15

#### Fuel Cell Systems Development for Commercial Applications: Requirements, Technology Status and Challenges

- Discussion of the drivers for fuel cells in commercial applications
- Listing and discussion of the requirements for some commercial applications
- Capability analysis of current fuel cell systems and challenges to be solved to bring the technology into mass commercialization

**William Resende**, Leader Fuel Cell Engineering / Hydrogen Projects, FPT Industrial

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**02:45**

**H2 - vehicle applications and integration**

**Soongil Kweon**, Part Leader / FUEL CELL Performance Test Team, Hyundai

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**03:15**

**Change to plenum for the summary session with the chairman**

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**E-drives II**

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**12:45**

**The next generation of electric vehicle buyers**

- Comparison vs. buyers from 2009-2019
- Research findings on next gen EV buyers
- EV buyer misconceptions
- EV "tipping point"

**Mike Dovorany**, Vice President, Escalent, USA

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**12:45**

| ADDITIONAL PRESENTATION PARALLEL TO SESSION

**Dynamic sealing with ultra-low friction for e-drives**

- Ultra-low friction by application of surface textures
- Performance in different cooling and lubrication media
- Customization capability by accurate simulation

**Ron Dircks**, Manager Business Development & Innovation, Eagle Simrax BV

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**01:15**

**Modular Multi-Speed Transmission for E-Vehicles**

**Harald Hinterwallner**, Executive Director Design & Engineering, Drexler Automotive GmbH, Germany

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**01:15**

| ADDITIONAL PRESENTATION PARALLEL TO SESSION

**Compact and efficient e-axle concept using innovative reduction gear arrangement**

**Makoto NISHIJI**, Senior General Manager, Jtekt

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**01:45**

**Coffee Break**

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**02:15**

**Flat wire motor: technical development of NEV traction motor**

- Demand characteristics of NEV traction motor
- Optimization and platform design approach of NEV traction motor
- Technical characteristics of flat wire motor and product development

**Jing Chen**, Director, Zhejiang Founder Motor Co., Ltd, China

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**02:45**

**Novel e-machine design using magnetic asymmetry for a magnet-free axle drive**

- Consideration of a preferred magnetic direction
- Performance increase of a wound field rotor design
- Simplified and compact e-drive system

**Dominik Grauvogl**, Doctoral Candidate, Vitesco Technologies GmbH, Germany

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**03:15**

**Change to plenum for the summary session with the chairman**

Concept comparisons HEV, BEV

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**12:45**

**A comparative study of different dedicated hybrid powertrains**

- Fuel consumption and CO2 legislation drives different levels of vehicle electrification for different segments
- Dedicated hybrid powertrains provide a good cost – efficiency ratio
- Dedicated hybrid powertrains design is driving e-motor size and design
- Comparative DHT study of efficiency and performance including main influences

**Dr Wolfgang Wenzel**, Senior Technical Specialist, BorgWarner, Germany

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**01:15**

**Modular electrified powertrain platform for passenger cars**

- Pure electrical integrated platform for the BEV fleet
- Modular and scalable approach for TM, EM, PE and Battery
- Battery Design influenced by recycling and remanufacturing

**Erik Schneider**, Senior Vice President E-traction and Hybrid Drivetrain, IAV GmbH, Germany

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**01:45**

**Coffee Break**

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**02:15**

**System optimisation of battery and e-axle through simulation of the total vehicle dynamics**

- Effects of e-machines types on driving dynamics and range
- Downsizing of e-components by using multi-speed gears
- Further measures to improve the electrical range
- Battery design with different storage strategies

**Hartmut Schneeweiss**, Senior Manager Technology & Innovation, Evergrande hofer Powertrain GmbH, Germany

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**02:45**

**How in-wheel motors transform battery packaging**

- Introduction to in-wheel motors
- Design challenges & solutions
- Opportunities for powertrain architecture compared to e-axes

**Richard Burke**, UK Engineering Director, Protean Electric, UK

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**03:15**

**Change to plenum for the summary session with the chairman**

Batteries

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**12:45**

**Status cell development**

**Prof. Dr Arno Kwade**, Director of the Institute for Particle Technology, TU Braunschweig Institut für Partikeltechnik (iPAT)

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**01:15**

**High performance battery systems – A view on the product lifecycle**

- Product lifecycle and second life use of battery systems
- Application areas of second life solutions
- From bus battery to mobile fast charging station

**Sven Schulz**, CEO, Akasol AG, Germany

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**01:45**

**Coffee Break**

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**02:15**

**Volvo modular electric propulsion traction battery**

- Platform integration and energy density
- Cell/module scalability and flexibility
- Battery Management System

**Klas Olsson**, Team Manager & Product Owner, Volvo Car Corporation, Sweden

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**02:45**

**Synergies between cell and system - new methodologies for battery analysis and battery system development**

- Versatile approach to understand complex battery mechanisms using new techniques
- Consideration of mechanical, thermal and electrical battery performance
- Closely coupled battery testing and simulation from cell to pack level

**Mareike Schmalz**, Project Engineer, APL GmbH, Germany

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**03:15**

**Change to plenum for the summary session with the chairman**

Operation Strategy, Software and AI

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**12:45**

**AI and data analytics for the development of 48V electric drives**

- Artificial intelligence
- Product optimisation
- 48V electric drives
- Data driven product development

**Dr Stefan Grubwinkler**, Teamlead Control Functions & AI, Vitesco Technologies GmbH, Germany

---

**01:15**

**From virtual sensors to cloud analytics: AI-based end-to-end drivetrain monitoring and optimisation**

- AI-based virtual sensor and durability engineering platform
- Design optimisation, predictive maintenance and value rating
- Series-vehicles as part of a holistic development process

**Dr Stéphane Foulard**, Managing Director, COMPREDICT GmbH, Germany

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**01:45**

## Coffee Break

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**02:15**

#### **Over the air (OTA) upgrades: drivetrain opportunities and impact of legal regulations**

- OTA as enabler technology
- Legal and regulatory view of OTA
- End-to-end OTA system design
- (Drivetrain) Opportunities

**Jochen Kurbjuweit**, Senior Manager Remote Software Upgrade, BMW AG, Germany

---

**02:15**

| ADDITIONAL PRESENTATION PARALLEL TO SESSION

#### **NVH simulation of automotive e-axle**

- Order Analysis of Automotive E-Axle
- Optimization of Gearing for NVH using
- Multibody Simulation

**Dipl.-Ing Timo Giese**, Technical Director, FunctionBay GmbH

**Dr. Davide Marano**

**M.Eng. Simon Schneider**

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**02:45**

#### **Intelligent clutch control for vehicle drive-off maneuvers**

- Solving a multi-objective optimization problem with reinforcement learning

**Alexander Lampe**, Development Engineer, PhD Student, IAV GmbH, Germany

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**02:45**

| ADDITIONAL PRESENTATION PARALLEL TO SESSION

#### **Model-led NVH Process for EV Drive Applications - The next chapter of CAE-led Design**

- Developing a new ferrite motor topology and electromechanical analysis tools for better system optimisation and integration
- Utilising a dedicated toolchain to aid the design and prototype of an EDU
- Investigate potential issues and help bring this new motor design to maturity, faster

**Dr. Annabel Shahaj**, Research & Innovation Operations Manager, Romax Technology

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**03:15**

**Change to plenum for the summary session with the chairman**

Development methods and tools

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**12:45**

**Parametric modeling and design of power-split hybrid powertrains**

- Derivation of a novel, non-physical modeling approach
- Parametric design study of a power-split hybrid powertrain
- Retransformation into a physical powertrain concept

**Bastian Krüger**, PhD student, BMW AG, Germany

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**01:15**

**Collaborative design of eDrive enabling to discard one development loop by doing more system simulations**

- New mobility has got specific requirements to be considered
- New advanced tools allowed the roll out plan optimisation
- Modular design
- Combined technologies

**Jerome Mortal**, Director, VALEO, France

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**01:45**

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**02:15**

**Virtual transmission calibration by usage of FEV's powertrain-in-the-loop approach**

- Virtual transmission calibration
- FEV's approach to powertrain-in-the-loop
- Future outlook

**Ralph Fleuren**, Product Manager, FEV Europe GmbH

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**02:15**

| ADDITIONAL PRESENTATION PARALLEL TO SESSION

**Simulation of face dog clutch machining process for driveline systems**

**HARUYAMA Tomohiko**, Manager, Data Analysis/Simulation, JTEKT, Japan

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**02:45**

**New validation methodology for electrified drivetrain**

- Reliability targets versus time to market at electrified drivetrains

**Günter Winkler**, Lead Engineer Transmission & E-Drive Testing, AVL List GmbH, Austria

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**02:45**

| ADDITIONAL PRESENTATION PARALLEL TO SESSION

**The effect of internal ring gear hard finishing on transmission NVH performance**

- Internal generating grinding, hard skiving
- Influence of hard finishing processes to NVH performance
- NVH simulation of EDU transmission with a planetary gear

**Noritaka Fujimura**, Project Manager, Mitsubishi Heavy Industries Machine Tool, Japan

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**03:15**

**Change to plenum for the summary session with the chairman**

Plenum

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## Summary of the CTI SYMPOSIUM GERMANY 2020



### **Prof. Dr Ferit Küçükay**

Director of the Institute of Automotive Engineering,  
Technische Universität Braunschweig,  
Germany

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## Exhibitors

### Allegheny



**Allegheny** is a highly skilled and experienced producer of high-performance polymer parts. Amongst other, the company specializes in friction & wear applications. It recently celebrated the 100 millionth thrust washer manufactured with industry leading capabilities, and mostly for German Tier1 suppliers. High3P represents Allegheny and supports customer developments in Europe.

### AVL



**AVL** is the world's largest independent company for the development of powertrains (combustion engines, transmissions, control software, power electronics, electric motors and batteries). The development and integration are fully supported by simulation tools, instrumentation & test systems, as well as the methodology required for passenger cars, trucks and marine engines. AVL offers a complete service portfolio for OEMs and transmission suppliers which contains design, analysis, calibration, transmission control development, hybridization and manoeuvre-based testing. AVL is a leader in developing highly-efficient and flexible E-axels and Electrified Transmissions including Dedicated Hybrid Transmissions to be implemented in AT, 48V or HEV/PHEV systems.

### **AVL List GmbH**

[www.avl.com/transmission](http://www.avl.com/transmission)

Buehler Motor, Inc.



**Bühler Motor** is an independent, globally-active company focused on the development and production of mechatronic drive solutions and electric pumps. A leading supplier in the Automotive industry, with more than 1,750 employees at eleven locations worldwide, we are committed to offering world-class products to help to improve the drivetrain efficiency and performance.

**Buehler Motor, Inc.**

[www.buehlermotor.com](http://www.buehlermotor.com)

Castrol Bp



**Castrol®** provides the oils, fluids and lubricants the world needs, for every driver, every rider and every industry. It's more than just oil. It's liquid engineering. The world of transport is going electric and e-fluids have a vital role to play. EV's play a key part in the mobility revolution and the pathway to decarbonizing transport. Castrol's e-Fluid expertise extends across land, sea and even space. Castrol has developed a range of e-fluids to meet the needs of vehicle manufacturers. From transmission fluids, to greases and coolants, these fluids enable electric vehicles to run smoothly, efficiently and stay cool.

**Castrol®**

[www.castrol.com](http://www.castrol.com)

ElringKlinger



**ElringKlinger** is one of the leading international automotive suppliers capable of developing and manufacturing technologically sophisticated components for all types of drive systems, whether combustion engines or electric solutions. Specially designed ElringKlinger components for engine, transmission, exhaust system, underbody, and vehicle body applications are used by virtually all car and engine manufacturers as well as many automotive suppliers worldwide.

**ElringKlinger AG**

[www.elringklinger.de](http://www.elringklinger.de)

EnginSoft GmbH



**EnginSoft** is one of the leading technology transfer companies in the field of Simulation Based Engineering Science (SBES). Since its foundation in 1984, EnginSoft has always been at the forefront of technological innovation.

Advanced skills in all disciplines in which simulation technologies are utilized, enables us to guide and assist customers with the process of digital transformation by identifying and resolving all the problems concerning the integration of simulation with other digital technologies, from the conception of a product, to its design and production.

We work across a broad range of industries that includes automotive, and are present in Italy, France, Germany, the UK, Sweden, Turkey and the U.S.A. and have a close worldwide partnership with synergetic companies.

**EnginSoft GmbH**

[www.enginsoft.com/de](http://www.enginsoft.com/de)

FunctionBay, Inc.



**FunctionBay** is a globally renowned CAE software supplier developing 'RecurDyn' which is an engineering simulation software based on Multibody-dynamics (MBD) with the most high-leveled cutting-edge technologies. FunctionBay has been providing many industry customers with various engineering simulation solutions and software especially for the field of automotive engineering including vehicle component analyses, electrification, and cooling.

**FunctionBay Inc.**

[www.functionbay.com](http://www.functionbay.com)

GETEC Getriebe Technik GmbH



**GETEC** is an independent engineering service provider in the field of vehicle and drivetrain which focus on Drivetrain Product Development, Vehicle Engineering Service, Mobility Intelligence, Drivetrain & Vehicle Testing with worldwide locations.

**GETEC Getriebe Technik GmbH**

[www.getec-gmbh.com](http://www.getec-gmbh.com)

HOERBIGER Antriebstechnik Holding GmbH



**HOERBIGER** is the first destination worldwide for drive train solutions. By offering technologically tailor-made system design, the Strategic Business Unit Drive Technology increases the efficiency of synchronizers and shift elements in transmissions, making a crucial contribution to sustainability and resource efficiency.

The product spectrum includes synchronizer systems for transmissions, shift elements for drive trains, and comfort systems for passenger cars and commercial vehicles. HOERBIGER offers all services from one source: from development to the series application of components and complete systems.

**HOERBIGER Antriebstechnik Holding GmbH**

[www.hoerbiger.com](http://www.hoerbiger.com)

Institute of Automotive Engineering



Jopp Holding GmbH



**JOPP's** impressive global products include gearshift systems, interior trim, precision machining, powder metal parts, plastic components and electronics. Developments include park lock actuators, internal and external shifters, e-shifters, thermal management, electronics and lubrication. With many patents, JOPP has been a 1<sup>st</sup> choice partner in the automotive industry for over 100 years.

**Jopp Holding GmbH**

[www.jopp.com](http://www.jopp.com)

JTEKT Corporation



As a leading global company designing & producing automotive components, **JTEKT Corporation** is seeking to refine its advanced technologies to provide greater safety, security & comfort.

Our best-in-class steering systems and driveline components, marketed under the JTEKT and TORSEN brands, provide an amazing driving experience while contributing to CO2 emission reduction.

Our KOYO bearings, specialized for use with EV drive systems, together with our expertise in developing and manufacturing high precision gear systems, make JTEKT your best partner for innovative and compact e-Axle solutions.

### **JTEKT Corporation**

[www.jtekt.co.jp/e/index.html](http://www.jtekt.co.jp/e/index.html)

### KOLEKTOR

The logo for KOLEKTOR, featuring the word "KOLEKTOR" in white, uppercase letters on a dark blue rectangular background.

**KOLEKTOR** is offering a range of smart actuators and integrated oil electrical pumps for cooling, lubrication and actuation applications in new generation electrified transmissions/ driveline applications for EV, PHEV and MHEV powertrains for passenger and commercial vehicles.

### KST

The logo for KST, featuring the letters "KST" in a bold, blue, sans-serif font, with a small orange square at the end of the "T".

Founded in 1967 and based in Bad Dürkheim/Germany KST-Motorenversuch is a test field operator in the automotive sector and actively engaged in providing independent development services for more than 5 decades now.

With around 200 highly qualified specialists KST-Motorenversuch operates a modern test field with a total of 85 test benches for passenger cars, commercial vehicles and large bore engines. For the development of vehicle powertrains for hybrid- and electrical drives KST-Motorenversuch disposes of a specialized development test field with state-of-the-art measuring equipment. In this dynamic environment KST is developing innovative test procedures together with its national and international customers. KST accompanies the dynamic change processes of future mobility solutions by prompt and targeted developments and investments in necessary validation procedures. These serve to ensure the reliability of the new drive concepts as for example hydrogen-fuel cells for automotive applications. As a family-run company our customers profit from quick decisions, short distances and efficient provision of services.

The logo for MAGNAX, featuring the word "MAGNAX" in a stylized, orange, uppercase font.

**Magnax** is building next-generation electric motors based on axial flux technology. We have developed a unique, proprietary variant of yokeless axial flux machines,

which can provide a step change in efficiency, weight, size, manufacturing and cost-effectiveness. The technology is used for electric vehicles with a high power density and efficiency requirement.

### **Magnax**

[www.magnax.com](http://www.magnax.com)

MANN+HUMMEL GmbH



**MANN+HUMMEL** is a leading global expert in filtration. The Ludwigsburg-based group develops filtration solutions for vehicles, industrial applications, clean air in indoor and outdoor spaces as well as for the sustainable use of water. In 2019, over 22,000 employees at more than 80 locations worldwide generated a turnover of EUR 4.2 billion. Products include, amongst others, air filter systems, intake systems, liquid filters, technical plastic parts, filter media, cabin filters, industrial filters and membranes for water filtration, sewage treatment and process applications.

### **MANN+HUMMEL GmbH**

[www.mann-hummel.com/](http://www.mann-hummel.com/)

PETRONAS Lubricants International



**PETRONAS**

**PETRONAS Lubricants International (PLI)** is the global lubricants manufacturing and marketing arm of PETRONAS, the national oil corporation of Malaysia. Established in 2008, PETRONAS Lubricants International manufactures and markets a full range of high-quality automotive and industrial lubricants products in over 80 markets globally. Headquartered in Kuala Lumpur, PLI has over 30 marketing offices in 23 countries, managed through regional offices in Kuala Lumpur (Malaysia), Turin (Italy), Belo Horizonte (Brazil), Chicago (USA) and Durban (South Africa). The Global Technology Center located in Turin, Italy, develops tailor made Transmission lubricants for several OEMs at global level, both for First Fill and for the Aftermarket same as high performance transmission oils for various motorsport applications (such as Formula 1 and DTM). PLI's portfolio offers a wide

range of Manual Transmission Fluids (MTF), Automatic Transmission Fluids (ATF incl. DCTF) and Axle/Differential Fluids for global applications in the automotive sector (Passenger Car and Commercial Vehicles).

### **PETRONAS Lubricants International**

[www.pli-petronas.com](http://www.pli-petronas.com)

### **PUNCH Powerglide Strasbourg SAS**



**PUNCH Powerglide** brings in more than 50 years of expertise in the development and production of automatic transmissions. Besides its conventional 6-speed automatic variants, PUNCH Powerglide's product line includes also mild hybrid (BSG) and full hybrid driveline solutions. The pipeline for future products includes DHTs and eDrive. In addition to complete gearboxes, PUNCH Powerglide supplies various components for the automotive sector and offers also technical services in the areas of testing, software programming, calibration and NVH analysis.

Furthermore, PUNCH Powerglide partners up with PUNCH Torino specialist in powertrain engineering and PUNCH Flybrid energy storage engineering in order to offer a complete solution for creating, diffusing and saving energy.

### **PUNCH Powerglide Strasbourg SAS**

[www.punchpowerglide.com](http://www.punchpowerglide.com)

### **Smalley**



**Smalley** is the inventor of the edgewound wave spring and with over 100 years of manufacturing excellence, Smalley is the Engineer's Choice® in providing wave springs, retaining rings, and constant section rings for all of your application needs.

### **Smalley**

[smalley.com](http://smalley.com)



**SCHERDEL**, with its 32 locations and over 5000 employees worldwide, offers a full product range in the area of engineering springs, metal forming and joining technology. The value chain contains service, engineering and production as well as in-house tool and machine construction for products used for powertrain, body and interior applications.



**SCHERDEL**

[www.scherdel.com](http://www.scherdel.com)

SMT

**SMT**

**SMT** is an internationally trusted provider of cutting-edge drivetrain design, analysis and simulation software as well as technical consultancy services. SMT has in-depth experience in all industries that involve gear-shaft-bearing systems. Increasing development efficiency, reducing costs and driving innovation has been the core outcome from all of its global projects.

**SMT**

[www.smartmt.com](http://www.smartmt.com)

UNICK

**UNICK**

Since 1971, **UNICK** has become one of the leading automobile component manufacturers of powertrain system that meets variable customer needs.

We are now more focused on developing thermal management & hydrogen fuel cell system required to green vehicle in order to achieve humanity vision for next generation.

From 2010, UNICK has developed hydrogen valves for hydrogen fuel cell stack system and high pressure control valve for hydrogen tank. We are also successfully producing battery coolant valves based on our valve manufacturing technologies for engine cooling. Our ultimate goal is being a company moving forward at offering total service from analysis to system evaluation with eco-technologies and contributing to clean mobility in the near future.

We'd like to look forward to finding a successful business partnership with all of you. Thanks

Victrex



**Victrex** is a world leader in high-performance PAEK-based polymer solutions, supporting engineers for more than 40 years in developing cost-effective, durable powertrain applications enhancing efficiency, safety and driving comfort. With

VICTREX™ PEEK polymer, APTIV™ film and VICTREX HPG™ Gears we provide innovative and cost-effective solutions for the most demanding powertrain components.

**Victrex**

[www.victrex.com/automotive](http://www.victrex.com/automotive)