INTERNATIONAL EV BATTERIES 2019: COST-EFFECTIVE ENGINEERING FOR HYBRID AND ELECTRIC VEHICLES

Institution of MECHANICAL ENGINEERS

5–6 November 2019
Kia Oval, London

Conference

KEY SPEAKERS INCLUDE:

Parmjeet Plahe, Senior Manager, High Voltage Battery Design
Jaguar Land Rover

Duncan Engeham, Global Engineering Director - Battery Systems
Cummins

Daniel Gribben, Engineering Manager
Envision AESC

Cedric Rouaud, Global Technical Expert - Thermal Systems
Ricardo

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PROFESSIONAL ENGINEERING

Book your place at: www.imeche.org/evbatteries

INTERNATIONAL EV BATTERIES 2019: COST-EFFECTIVE ENGINEERING FOR HYBRID AND ELECTRIC VEHICLES

5–6 November 2019, Kia Oval, London

IT IS ESTIMATED THAT THE ELECTRIC VEHICLE BATTERY MARKET IS NOW WORTH £5 BILLION IN THE UK. WITH INCREASING GOVERNMENT INVESTMENT, NOW IS THE TIME FOR THE INDUSTRY TO MAKE EXISITING TECHNOLOGY EVEN MORE EFFICIENT TO ATTRACT FURTHER BUY-IN.

This unique conference will address the latest engineering design processes and best practice in battery application for a more resilient and cost-effective battery.

With more and more OEMs investing in battery application, benefit by learning more about the latest projects from Jaguar Land Rover, Cummins, Delta Motorsport and Airbus. Explore the challenges they encounter across the lifecycle of the battery from its initial design and manufacture to the end of life process. Not only will you hear from the end users but also the wider supply chain to ensure your organisation improves battery performance and durability.

Discuss the best methods to manage battery use and application with representatives from OEMs, battery manufacturers, battery management systems providers and academic institutions.

KEY PROGRAMME HIGHLIGHTS:

- **Ilika** outline their vision and plan for solid state battery development
- **Airbus** discuss electric vehicle battery development in aerospace through their various projects including the E-Fan X demonstrator
- **Warwick Manufacturing Group** introduce their work into existing processes for recycling and incorporating electric vehicle batteries into these
- **Millbrook** highlight best practice in automotive battery testing including how to split testing into cell, module and pack
- **Cosworth** share their findings from the UK-ABSC concept demonstrator programme

ATTEND THIS CONFERENCE TO:

- **Hear over 16 hours of content on electric vehicle battery development from pioneering users of battery technology including Renault, Aston Martin and Ford Motor Company**
- **Network with battery research, design and systems engineers as well as battery management systems experts**
- **Invest in cost-effective battery technology by gaining insight into the latest cell, module and pack designs**
- **Gain insight into the latest thermal management technologies to mitigate the risk of thermal runaway**
- **Receive an update on the status of battery manufacturing in the UK and the supply chain across the world**

TECHNICAL ADVISORY BOARD:

Paul McNamara, Technical Director
Williams Advanced Engineering

Billy Wu, Senior Lecturer, Faculty of Engineering, Dyson School of Design Engineering
Imperial College London

Greg Harris, Global Electrification Services Leader
HORIBA MIRA

Mike Richardson, Principal Consultant Energy Innovation
Warwick Manufacturing Group

WWW.IMECHE.ORG/EVBATTERIES
BOOK YOUR PLACE TODAY

TERMS AND CONDITIONS APPLY

PROGRAMME

TUESDAY, 5 NOVEMBER 2019

08:30	REGISTRATION AND REFRESHMENTS	
09:00	**CHAIR'S OPENING REMARKS** Paul McNamara, Technical Director, Williams Advanced Engineering	
	UK STATUS AND OVERVIEW	
09:10 **KEYNOTE**	**BATTERY DESIGN AND RELEASE FOR HIGH VOLUME MANUFACTURE** Nigel Taylor, Senior Manager, Advanced Battery Design, Jaguar Land Rover Parmjeet Plahe, Senior Manager, High Voltage Battery Design, Jaguar Land Rover	
09:40	**QUESTION AND ANSWER SESSION**	
09:45	**OVERVIEW OF FARADAY CHALLENGE PROJECTS** Anna Wise, Innovation Lead for Batteries, Innovate UK	
10:10	**CHALLENGE OF LARGE-SCALE LITHIUM ION BATTERY MANUFACTURE IN THE UK** Dan Gribben, Engineering Manager, Envision AESC	
10:35	**QUESTION AND ANSWER SESSION**	
10:45	NETWORKING REFRESHMENT BREAK	
	BATTERY CELL DESIGN AND LATEST CHEMISTRIES	**INTEGRATION OF THE BATTERY IN THE EV POWERTRAIN**
11:15	**SETTING THE SCENE FOR SOLID STATE BATTERIES** Denis Pasero, Product Commercialisation Manager, Ilika	**THE CHALLENGES OF ENGINEERING AND INTEGRATING HIGH-POWER BATTERY SYSTEMS** Nick Carpenter, Engineering Director, Delta Motorsport
11:40	**UNDERSTANDING BATTERY CELLS, SPECIFICATIONS AND SUPPLIERS** Ian Whiting, Business Development Director, AGM Batteries Ltd	**BATTERY AND INVERTER WITHIN THE CONTEXT OF THE POWERTRAIN** Paul McNamara, Technical Director, Williams Advanced Engineering
12:05	**UNDERSTANDING AND MODELLING AGEING OF LITHIUM-ION BATTERIES** David Howey, Associate Professor, Department of Engineering Science, University of Oxford	**DEVELOPING BATTERIES FOR COMMERCIAL VEHICLES** Duncan Engeham, Global Engineering Director - Battery Systems, Cummins
12:30	**QUESTION AND ANSWER SESSION**	
12:45	NETWORKING LUNCH	
	BATTERY RECYCLING AND SECOND LIFE	**LESSONS LEARNED FROM THE AEROSPACE SECTOR**
13:45	**RECYCLING OF VEHICLES: EXISTING PROCESSES COVERING THE WHOLE RECYCLING CHAIN** Anwar Sattar, Lead Engineer in Battery Recycling, Warwick Manufacturing Group	**THE FUTURE ROLE OF ENERGY STORAGE SYSTEMS IN AEROSPACE** Maite Carreras Orobengoa, Electrical and Power Engineer, Airbus Defence and Space
14:10	**BATTERY SUPPLY CHAIN ADAPTATION TO THE CIRCULAR ECONOMY** Alberto F. Minguela, Technical Lead, Circular Economy, HSSMI Fergal Harrington-Beatty, Automotive Electrification Programme Manager, HSSMI	**AEROSPACE TO EV: UNDERSTANDING THE SHARED CHALLENGES** Yura Sevcenco, Senior Development Engineer, Combustion Specialist, Reaction Engines
14:35	**QUESTION AND ANSWER SESSION**	
14:45	NETWORKING REFRESHMENT BREAK	
15:15	**LATEST BATTERY SYSTEMS DEVELOPMENT WITHIN RICARDO: A FOCUS ON COOLING SYSTEM AND THERMAL RUNWAY** Cedric Rouaud, Global Technical Expert – Thermal Systems, Ricardo	
15:40	**HEAT PIPE BASED THERMAL MANAGEMENT SYSTEM FOR ELECTRICAL BATTERIES AND FUEL CELLS** Hussam (Sam) Jouhara, Professor of Thermal Engineering, Brunel University London	
16:05	**SAFELY ENGINEERING FOR ACCIDENTS** Martin Brown, Improvement Consultant, HORIBA MIRA	
16:30	**QUESTION AND ANSWER SESSION**	
16:45 **PANEL DISCUSSION**	**THE FUTURE OF THE LIFECYCLE OF THE BATTERY** Anwar Sattar, Lead Engineer in Battery Recycling, Warwick Manufacturing Group Oskar Dondelewski, Lead Research Engineer, Aston Martin Gael Chouchelamane, Chief Engineer – Battery Systems, Ricardo	
17:20	**CHAIR'S CLOSING REMARKS**	
17:30	END OF DAY ONE	

PROGRAMME

	WEDNESDAY, 6 NOVEMBER 2019
08:30	REGISTRATION AND REFRESHMENTS
09:00	**CHAIR'S OPENING REMARKS**
09:10 **KEYNOTE**	**MANAGING BATTERY AGEING AND EXTENDING BATTERY LIFE** **Philippe Gyan, Innovation Pilot Battery System Modelling Research Engineer, Renault**
09:40	**QUESTION AND ANSWER SESSION**
	STATE-OF-THE-ART TESTING TECHNOLOGIES AND METHODS
09:45	**BATTERY DESIGN AND SIMULATION TOOLS: A CASE STUDY** **Oskar Dondelewski, Lead Research Engineer, Aston Martin**
10:10	**AUTOMOTIVE BATTERY TESTING CAPABILITY AND BEST PRACTICE** **Peter Miller, Chief Engineer – Battery, Millbrook**
10:35	**HARNESSING DIGITAL TECHNOLOGIES FOR BETTER BATTERIES** **Jacqueline Edge, Multiscale Modelling Project Manager, Imperial College London**
11:00	**QUESTION AND ANSWER SESSION**
11:15	NETWORKING REFRESHMENT BREAK
	BATTERY MANAGEMENT SYSTEMS FOR LONGER BATTERY LIFE
11:45	**CASE STUDY: COOLING THE BATTERY DURING CHARGING** **Tim Nicklin, Manager, EV Charging and Energy Management SEO, Ford Motor Company**
12:10	**CONSIDERATIONS FOR BATTERY SIMULATION** **Stuart Nixon, Solution Consultant, Dassault Systèmes**
12:35	**QUESTION AND ANSWER SESSION**
12:45	NETWORKING LUNCH
13:50	**SMART CELLS, SMART THINKING: THE BENEFITS OF A DIFFERENT APPROACH TO HV BATTERY MANAGEMENT** **Paul Freeland, Principal Engineer, Cosworth**
14:15	**LATEST MONITORING TECHNOLOGY FOR BATTERIES** **Speaker to be announced**
14:40	**QUESTION AND ANSWER SESSION**
14:55	NETWORKING REFRESHMENT BREAK
	MODULE AND PACK DESIGN FOR EFFICIENCY
15:25	**48V HIGH-POWER BATTERY PACK FOR MHEVS** **Stephen Borman, Principal Power Electronics Engineer, MAHLE Powertrain**
15:50	**SCALABLE MULTI-PHYSICS MODELLING: VIRTUAL TOOLS TO STREAMLINE THE BATTERY PACK DESIGN PROCESS** **Paul McGahan, Technical Lead, Ricardo**
16:15	**QUESTION AND ANSWER SESSION**
16:25	**CHAIR'S CLOSING REMARKS**
16:30	END OF SEMINAR

FEEDBACK FROM PREVIOUS EVENTS:

"THE CONFERENCE OFFERED GREAT EXPOSURE TO OTHER PROFESSIONALS AND PROVIDED INSIGHT INTO INDUSTRY DEVELOPMENTS ON TECHNOLOGIES. ATTENDING THIS EVENT ENABLED ME TO CHALLENGE AND PROBE ENGINEERING APPROACHES"

Engineering Manager, CAT

"THIS CONFERENCE IS WELL WORTH ATTENDING, AS IT PROVIDED A COMPREHENSIVE OVERVIEW OF THE MAIN TECHNOLOGIES AND TRENDS IN THE EV SECTOR"

Technology Director, Eminox

For the most up-to-date and detailed programme for the event, please visit: www.imeche.org/evbatteries

- This programme is subject to change.
- The Institution is not responsible for the views or opinions expressed by individual speakers.

WHO SHOULD ATTEND?

Engineers with direct or indirect interest in hybrid and electric vehicles, batteries, battery management systems and thermal management systems at the following types of organisations:

- Vehicle OEMs
- Battery manufacturers
- Integrators
- Powertrain manufacturers
- Anode, cathode & separator material suppliers
- Lithium and raw materials suppliers
- Battery testing equipment and service providers
- Battery management system manufacturers
- Thermal management system manufacturers

WHO ATTENDED OUR PREVIOUS EVENTS AND WHO CAN I EXPECT TO MEET AT INTERNATIONAL EV BATTERIES 2019?

Last year's conference saw a diverse mix of attendees from across the automotive industry attend International EV Batteries. Attendees included representatives from Jaguar Land Rover, Bentley Motors, McLaren Automotive and Williams Advanced Engineering. The event also saw strong attendance form battery manufacturers and those providing testing software and services.

FEEDBACK FROM PREVIOUS EVENTS:

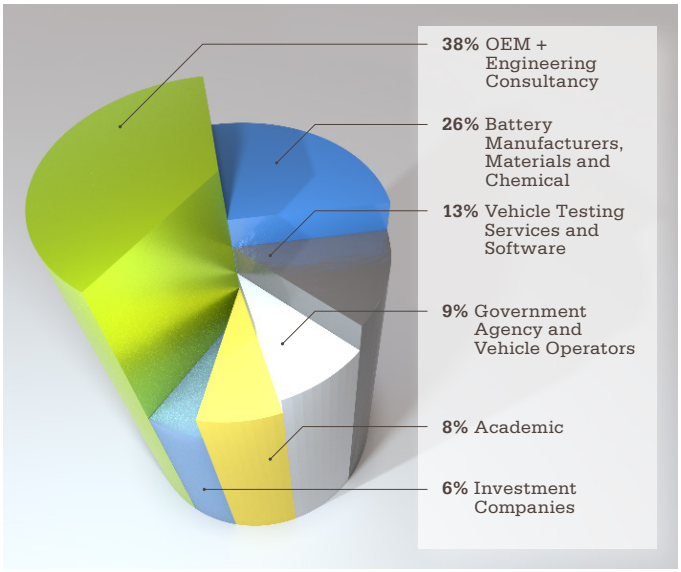
"THE QUALITY OF THE ATTENDEES AND MORE IMPORTANTLY SPEAKERS GAVE GREAT INSIGHT INTO THE CURRENT TRENDS AND AREAS OF FOCUS FOR ALL CONCERNED ASPECTS OF THE SUPPLY CHAIN. I WILL CERTAINLY ATTEND THE NEXT EVENT"

Business Development Manager, Johnson Matthey

"A WELL-STRUCTURED, INFORMATIVE AND INTERACTIVE EVENT, WITH A HIGH GRADE LIST OF SPEAKERS AND DELEGATES"

Director, EMB Technical Services

ATTENDEE COMPANY BREAKLDOWN



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HOW TO BOOK YOUR PLACE

FEES AND CHARGES

Registration fees include entry to the sessions, refreshments and a copy of the conference proceedings.

Delegate Type	EARLY BIRD RATE Until 20 September 2019	STANDARD RATE
Member, Institution of Mechanical Engineers / Supporting Organisation	£399 + VAT = £478.80	£439+ VAT = £526.80
Non-member	£579 + VAT = £694.80	£639 + VAT = £766.80
Full-time Student/Retired	£299 + VAT = £358.80	£329 + VAT = £394.80

THREE WAYS TO BOOK

1 online:
www.imeche.org/evbatteries

2 email:
eventenquiries@imeche.org

3 phone:
+44 (0)20 7973 1251

Please read the information listed below as each booking is subject to the Institution's standard terms and conditions.

CONDITIONS OF BOOKING

Completed application forms should be returned to the address above, along with the correct payment. Attendance at the event will be confirmed on receipt of the full balance. All participants are advised to bring a copy of their confirmation with them on the day, to ensure the fastest possible entry.

SPECIAL REQUIREMENTS

Please inform us of any special requirements, ie dietary or access, on the relevant section of the booking form or email eventenquiries@imeche.org

Cancellation

For a refund (minus £25+VAT admin charge), cancellations must be received at least 30 days prior to the event. Replacement delegates are welcome at any time. The Institution reserves the right to cancel any event. In this case, the full fee will be refunded unless a mutually convenient transfer can be arranged. In the event that the Institution postpones an event for any reason and the delegate is unable or unwilling to attend on the rescheduled date, they will receive a full refund of the fee paid. The Institution is not responsible for any loss or damage as a result of a substitution, alteration or cancellation/postponement of an event. The Institution shall assume no liability whatsoever if this event is cancelled, rescheduled or postponed due to a fortuitous event, Act of God, unforeseen occurrence or any other event that renders performance of this conference impracticable, illegal or impossible. For the purposes of this clause, a fortuitous event shall include, but not be limited to: war, fire, labour strike, extreme weather or other emergency.

Please note that while speakers and topics were confirmed at the time of publishing, circumstances beyond the control of the organisers may necessitate substitutions, alterations or cancellations of the speakers and/or topics. The Institution reserves the right to alter or modify the advertised speakers and/or topics if necessary without any liability to you whatsoever. Any substitutions or alterations will be updated on the event's webpage as soon as possible.

LIABILITY

The organisers do not accept liability for any injuries or losses of any nature incurred by delegates and/or accompanying persons, nor for loss or damage to their luggage and/or personal belongings.

CONFERENCE VENUE

The Kia Oval
Surrey County Cricket Club
Kennington
London
SE11 5SS

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GET INVOLVED

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Institution of MECHANICAL ENGINEERS

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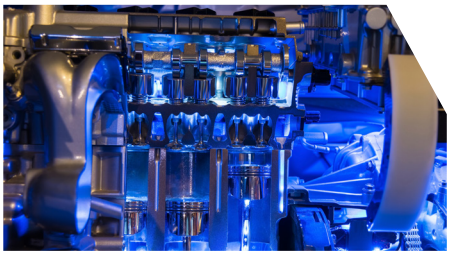
OTHER EVENTS TO LOOK FOR

SIMULATION AND MODELLING 2019

17–18 September 2019, Birmingham

This conference will provide a forum to discuss the latest developments being made with computer aided and virtual engineering. Explore the advances being made with integration, optimisation and validation, from design stage right through to manufacturing.

www.imeche.org/simmod2019



INTERNAL COMBUSTION ENGINES AND POWERTRAIN SYSTEMS FOR FUTURE TRANSPORT

11–12 December 2019, Birmingham

This conference will cover issues for the internal combustion engine market and reflect on the impact of alternative powertrains on the propulsion industry. Join us to benefit from the insights and perspectives of engineers, researchers and academics from around the world.

www.imeche.org/icengines

The Institution of Mechanical Engineers organises over 120 events a year, including free-to-attend lectures as well as conferences, seminars, annual luncheons and dinners. Please visit www.imeche.org/events for the complete list of events.

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