

INTERNATIONAL EV BATTERIES 2016 COST-EFFECTIVE ENGINEERING FOR HYBRID AND ELECTRIC VEHICLES

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Knowledge Transfer
Conference

6-7 December 2016
One Birdcage Walk, London, UK

KEY SPEAKERS INCLUDE:

Gregory Smith
Bolt EV Battery Pack Engineering Group Manager
General Motors

Sunoj George
Head of Hybrid Systems
McLaren Automotive

Mike Richardson
Chief Technical Specialist, Low Carbon Vehicles
Jaguar Land Rover

Uwe Likar
Manager Advanced Engineering Planning
Mitsubishi Motor R&D Europe

Phil Whiffin
Chief Engineer – Electrical and Electronic Engineering,
Group and Advanced Research
JCB



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INTERNATIONAL EV BATTERIES 2016 COST-EFFECTIVE ENGINEERING FOR HYBRID AND ELECTRIC VEHICLES

6–7 December 2016

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THIS TWO-DAY EVENT WILL SHOWCASE HOW VEHICLE OEMS ARE COST-EFFECTIVELY INCREASING RANGE, ENHANCING PERFORMANCE AND IMPROVING SAFETY AND DURABILITY OF EV BATTERIES.

International EV Batteries 2016 will address the critical challenges being faced by electric vehicle OEMs globally. Attendees will take away the latest innovations in battery management, modular design, range extension, battery testing and pack integration.

The best-selling vehicle brands are all offering EVs as a part of their model range. As with any advanced technology, challenges are still being faced. Key limitations include the battery packs and cells, especially when compared to combustion engines, and most notably in the cost and performance of the battery.

By addressing the limitations at the battery, this must-attend event will bring forward the vehicle OEMs perspectives and latest innovations for overcoming the challenges.

KEY PROGRAMME HIGHLIGHTS:

- **General Motors** will discuss the successes of the Chevrolet Bolt EV's 60KwH battery system and lessons from the Volt and Spark
- Understand the opportunities and challenges **Jaguar Land Rover** see for modular battery designs
- **Williams Advanced Engineering** determine how F1 and Formula E battery development and evolution will impact electric vehicles
- **McLaren Automotive** and **University of Oxford** deliver the latest on charge and current control, and reductions in weight and size of the Battery Management System (BMS)
- Learn how the **European Commission** are assessing battery testing methods from a policy-making perspective
- **Mitsubishi**, **NAATBatt** and the **University of Warwick WMG** bring success stories for bidirectional charging, battery recycling and second-life options

KEY BENEFITS INCLUDE:

- Understand the innovations being made with cost, range, performance, safety and durability challenges
- Hear from leading Automotive OEMs including **General Motors, Mitsubishi, McLaren, Detroit Electric, Jaguar Land Rover, Williams, Scania, Volvo** and **JCB**
- Insights from the **European Commission, NAATBatt** and the **International Air Transport Association**
- Network and engage with colleagues, peers and industry innovators from across the hybrid and electric vehicle sector
- Discuss the key engineering innovations being made in battery management, modular design, range extension, battery testing and pack integration
- Decipher air transport regulations, recycling and second-life options, and battery testing methods

WITH THANKS TO THE 2016 ADVISORY BOARD:

Mike Richardson, Chief Technical Specialist
Hybrids and Electrification
Jaguar Land Rover

Ted Miller, Senior Manager Energy Storage
Strategy and Research
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John Muldoon, Senior Principal Scientist,
Post Li-Ion Battery
Toyota USA

Bob Galyen, Chair, Battery Standards
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**TERMS AND
CONDITIONS
APPLY**

PROGRAMME

DAY 1	TUESDAY 6 DECEMBER
08:30	REGISTRATION AND REFRESHMENTS
09:00	CHAIR'S WELCOME AND OPENING REMARKS
	BATTERIES: THE STRATEGIC PERSPECTIVE
09:10 PANEL DISCUSSION	IDENTIFYING THE ROADBLOCKS FOR A FULLY ELECTRIC FUTURE Sunoj George, Head of Hybrid Systems, McLaren Automotive Albert Lam, Chairman & CEO, Detroit Electric Uwe Likar, Manager Advanced Engineering Planning, Mitsubishi Gregory Smith, Bolt EV Battery Pack Engineering Group Manager, General Motors Nigel Taylor, Senior Manager Energy Storage and Consumption, Jaguar Land Rover <ul style="list-style-type: none"> Identifying the role of EVs and how developments in performance and durability are balanced with cost Developing infrastructure and technologies in EVs Fast and extreme battery charging – EV battery capability and grid impact
09:55	UPSCALING BATTERY TECHNOLOGIES: FROM MATERIALS SCIENCE TO PACK ENGINEERING Billy Wu, Lecturer, Dyson School of Design Engineering, Imperial College London <ul style="list-style-type: none"> Addressing the interface between fundamental material science and engineering integration Outlining the challenges with current and future battery chemistries Using models and diagnostic techniques to improve battery lifetime and inform pack designs
10:25	QUESTION AND ANSWER SESSION
10:30	NETWORKING REFRESHMENT BREAK
	MODULE DESIGN FOR HEVS AND EVS
11:00	OPPORTUNITIES AND CHALLENGES FOR MODULAR BATTERY DESIGNS Nigel Taylor, Senior Manager Energy Storage and Consumption, Jaguar Land Rover <ul style="list-style-type: none"> Ongoing investigations into the impact of modular battery packs for ease of use Battery cell, module and component commonality ideas Module configuration for improved safety and simple maintenance
	BATTERY MANAGEMENT SYSTEMS
11:35	THE CHEVROLET BOLT EV BATTERY SYSTEM Gregory Smith, Bolt EV Battery Pack Engineering Group Manager, General Motors
12:10	REDUCING THE SIZE AND WEIGHT OF BATTERY PACKS WITHOUT IMPACTING PERFORMANCE Sunoj George, Head of Hybrid Systems, McLaren Automotive <ul style="list-style-type: none"> Maximising cell performance at the pack level Impact of cooling solutions Battery electronics and associated footprint
12:45	QUESTION AND ANSWER SESSION
13:00	NETWORKING LUNCH
14:00	ADVANCED BATTERY MANAGEMENT SYSTEMS David Howey, Associate Professor in Engineering Science, University of Oxford <ul style="list-style-type: none"> Overview of state of charge estimation, power capability estimation and balancing schemes Control of battery charging The challenge of degradation and state of health estimation
	BATTERY TESTING
14:35	BATTERY TESTING METHODS ASSESSED FROM A POLICY-MAKING PERSPECTIVE Andreas Pfrang, Scientist, Battery Energy Storage Testing For Safe Electrification of Transport (BESTEST), European Commission Joint Research Centre <ul style="list-style-type: none"> Assessment of the suitability of testing methods for policy purposes Insight to in-house battery testing capabilities and testing programs How to ensure a suitable level of safety for electric vehicles by regulation
15:10	QUESTION AND ANSWER SESSION
15:20	NETWORKING REFRESHMENT BREAK

PROGRAMME

DAY 1 TUESDAY 6 DECEMBER (CONT.)	
15:50	TECHNOLOGY AND INNOVATION HOTSPOT DISCUSSIONS: <ul style="list-style-type: none">• The intersection between electrified and autonomous vehicles• Battery chemistries for the future and their potential impact on current engineering and integration• Range expectations: What range is acceptable to meet customer requirements?• Can the material supply chain support the growth of the industry?• Stranded Energy: What should be done with batteries post-crash, seizure or abandonment?
16:50	CHAIR'S CLOSING REMARKS
17:00	END OF DAY ONE

DAY 2 WEDNESDAY 7 DECEMBER	
08:30	REGISTRATION AND REFRESHMENTS
09:00	CHAIR'S WELCOME AND OPENING REMARKS Mike Richardson, Chief Technical Specialist Hybrids and Electrification, Jaguar Land Rover
	ENHANCING VEHICLE PERFORMANCE
09:10	FROM RACE TO ROAD: HOW F1 AND FORMULA E BATTERY DEVELOPMENT AND EVOLUTION WILL IMPACT ELECTRIC VEHICLES Ian Cluett, Head of Programmes and Commercial, Williams Advanced Engineering <ul style="list-style-type: none">• Williams have developed batteries for the FIA Formula E electric car race series based on F1 technology• These batteries are pushing the boundaries of power, energy density, advanced cell and thermal management• How can some of these technologies be applied in a cost effective manner to future car hybrid and electric vehicles?
	IMPROVING BATTERY DURABILITY
09:40	CHALLENGES IN KNOWING WHAT IS REALLY GOING ON INSIDE THE BATTERY Annika Ahlberg-Tidblad, Senior Engineer, Materials Technology Hybrid and Electronics, Scania <ul style="list-style-type: none">• State of health determination - what does it say about the condition of the battery?• Understanding possible aging processes and their implication on battery performance and life• Predictability of single cell field failures
10:10	CHALLENGES OF BATTERY CYCLE LIFE FOR HEAVY DUTY XEVs Istaq Ahmed, Research and Development Engineer, Advanced Research & Technology, Volvo Group Trucks Technology <ul style="list-style-type: none">• Difference between light and heavy duty demand• Fast-charging impact on cycle-life• Implication of cycle-life transferring from HEVs to EVs
10:40	QUESTION AND ANSWER SESSION
10:55	NETWORKING REFRESHMENT BREAK
11:25	BATTERY PACK INTEGRATION IN OFF HIGHWAY VEHICLES Phil Whiffin, Chief Engineer – Electrical and Electronic Engineering, Group and Advanced Research, JCB <ul style="list-style-type: none">• Addressing environmental, cooling and duty cycle challenges• Overcoming volume limitations and cost challenges• Opportunities in weight, structure build and the market
11:55	BATTERY CELL SIMULATION Dharmika Widanalage, Assistant Professor, Energy and Electrical Systems, University of Warwick WMG <ul style="list-style-type: none">• Assessing battery usage• Gaining solutions by characterising at battery cell level• Determining the need for high fidelity in battery systems

For the most up-to-date and detailed programme for the event, please visit:
www.imeche.org/evbatteries2016

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

PROGRAMME

DAY 2 WEDNESDAY 7 DECEMBER (CONT.)	
12:25	QUESTION AND ANSWER SESSION
12:35	NETWORKING LUNCH
	CHARGING, TRANSPORTATION AND SECOND LIFE
13:35	THE BIDIRECTIONAL (V2X) CHARGING SYSTEM FOR MITSUBISHI VEHICLES Uwe Likar, Manager Advanced Engineering Planning, Mitsubishi <ul style="list-style-type: none">• The charging system of the Mitsubishi EV and PHEV vehicles - AC/DC charging and the CHAdeMO charging interface as technical base for the bidirectional charging• Integration of the V2X system to the drive battery and the vehicle• Projects in Japan and Europe - possible applications and V2X charging for re use battery projects
14:05	AIR TRANSPORT REGULATIONS FOR LITHIUM-ION BATTERIES AND THEIR IMPACT ON THE AUTOMOTIVE MARKET David Brennan, Assistant Director, Cargo Safety & Standards, International Air Transport Association (IATA) <ul style="list-style-type: none">• Understanding the approval requirements for transporting EV batteries• Reviewing the limitations, potential delays and obstructions• Safety considerations, concerns and the opportunities for making transportation more routine
14:35	QUESTION AND ANSWER SESSION
14:45	NETWORKING REFRESHMENT BREAK
15:15 PANEL DISCUSSION	LIFECYCLE MANAGEMENT OF ADVANCED AUTOMOTIVE BATTERIES James Greenberger, Executive Director, National Alliance for Advanced Transportation Batteries (NAATBatt) James Marco, Reader, International Digital Laboratory, University of Warwick WMG Dirk Spiers, President, Spiers New Technologies <ul style="list-style-type: none">• Potential prospects for second life use• The economics of advanced battery recycling• Regulatory mandates for advanced battery recycling
16:00	CHAIR'S CLOSING REMARKS
16:10	END OF CONFERENCE

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FEES AND CHARGES

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

Delegate Type	Early Bird Rate Until 14 October 2016	Standard Rate
Member, Institution of Mechanical Engineers/ Supporting organisation	£349 + VAT	£399 + VAT
Non-member	£449 + VAT	£499 + VAT
Student/Retired	£299 + VAT	£299 + VAT

Group booking discounts are available. Contact us for more information.

THREE WAYS TO BOOK

- 1 Online:
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- 2 Email:
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- 3 Phone:
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Please read the information listed below as each booking is subject to the Institution's standard terms and conditions.

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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 this form.

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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

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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 Institution of Mechanical Engineers
One Birdcage Walk
London

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OTHER EVENTS TO LOOK FOR



03 NOVEMBER 2016

Brakes 2016

This unmissable one-day seminar will deliver the latest developments being made with brakes and braking systems across the automotive industry.

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17 NOVEMBER 2016, THE DORCHESTER, LONDON

The Institution of Mechanical Engineers' Annual Dinner

The Institution's Annual Dinner will be returning to London's Dorchester hotel Thursday 17 November 2016, to celebrate the engineering profession with over 400 engineers and industry leaders from the most prominent international companies and organisations.

imeche.org/annualdinner2016

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