

INTERNATIONAL EV BATTERIES 2018: COST-EFFECTIVE ENGINEERING FOR HYBRID AND ELECTRIC VEHICLES

Institution of
**MECHANICAL
ENGINEERS**

6–7 November 2018
Twickenham Stadium, London

More details available at
www.imeche.org/evbatteries

KEY SPEAKERS INCLUDE:

Tony Harper, Director,
**UK Research and Innovation, Faraday Battery
Challenge**

Andreas Pfrang, Scientist, Directorate for Energy,
Transport and Climate, Energy Storage Unit,
European Commission, DG Joint Research Centre

Nigel Taylor, Senior Manager Advanced Batteries,
Jaguar Land Rover

Adrian Bell, Principal Engineer Electrical Systems,
Williams Advanced Engineering

Steven Woolley, Chief Technology Officer,
Mahindra Electric

Conference



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BPVA British Power Vehicle Association

EVSA Electric Vehicle Society of America

FISITA

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IBESA BATTERY & ENERGY STORAGE
International Alliance

EVSA Electric Vehicle Society of America
Bharat Automobile Electric Corporation
Fluorocarbon Energy Storage

LowCV
Low Carbon Vehicle Partnership

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PROGRAMME

DAY ONE	TUESDAY, 6 NOVEMBER 2018	
08:30	REGISTRATION AND REFRESHMENTS	
09:00	CHAIR'S WELCOME AND OPENING REMARKS	
	THE INTERNATIONAL BATTERY MARKET	
09:10 KEYNOTE	KEYNOTE: GOVERNMENT PLANS FOR ELECTRIC VEHICLES Tony Harper, UK Research and Innovation, Director of the Faraday Battery Challenge	
09:40	AN UPDATE FROM THE EUROPEAN COMMISSION: THERMAL RUNAWAY PROPAGATION IN LI-ION BATTERIES Andreas Pfrang, Scientist, Directorate for Energy, Transport and Climate, Energy Storage Unit, European Commission, DG Joint Research Centre	
10:10	QUESTION AND ANSWER SESSION	
10:20 PANEL DISCUSSION	DEVELOPMENTS IN INDUSTRY AND RESEARCH PROJECTS IN THE UK Tony Harper, UK Research and Innovation, Director of the Faraday Battery Challenge Nick Carpenter, Engineering Director, Delta Motorsport Toby Schulz, CTO & Director, Vantage Power	
	<ul style="list-style-type: none"> • Update on the Faraday Challenge and related government supported activities • How industry is using government schemes to support research and developments • Overview of the progress being made in industry and vision for industry growth 	
10:50	SPEED NETWORKING AND NETWORKING REFRESHMENT BREAK	
	THERMAL REQUIREMENTS	AEROSPACE AND MARINE HYBRID APPLICATIONS
11:30	THE ELECTRICAL, MECHANICAL AND THERMAL REQUIREMENTS OF AN ELECTROCHEMICAL STORAGE SYSTEM Nigel Taylor, Senior Manager Advanced Batteries, Jaguar Land Rover	HYBRID ELECTRIC AIRCRAFT: REQUIREMENTS AND CHALLENGES Rebecca Todd, Senior Lecturer, Power Conversion Research Group, University of Manchester
12:00	THERMAL MANAGEMENT OF AN EV BATTERY PACK Marco Buonfiglioli, Principal Engineer, Siemens	AEROSPACE ELECTRIFICATION Mark Scully, Head of Technology - Advanced Systems and Propulsion, Aerospace Technology Institute
12:30	BATTERY LIFETIME MODELLING FOR EFFECTIVE THERMAL MANAGEMENT Zachary Edel, Senior Research Engineer, ThermoAnalytics	INNOVATIVE HYBRID SYSTEMS FOR SMALL CRAFT Graeme Hawksley, Managing Director, Hybrid Marine Ltd
13:00	QUESTION AND ANSWER SESSION	
13:15	NETWORKING LUNCH	
	MODULAR BATTERY PACK DESIGN	ROLE OF BATTERY PACKS WITHIN A SYSTEM
14:15	SCALABLE MULTI-PHYSICS MODEL TO STREAMLINE THE BATTERY PACK DESIGN PROCESS Martin Filipec, Project Leader HIFI-ELEMENTS Project, Ricardo Innovation	HIGH POWER BATTERY PACK FOR MILD-HYBRID ELECTRIC VEHICLES Christian Vogler, MAHLE Powertrain
14:45	SELECTION OF COMMERCIAL CELLS TO FIT A MULTIPLE PURPOSE MODULAR BATTERY PACK CONCEPT: IMODBATT Iosu Cendoya, iModBatt Project Coordinator, Cidetec Energy Storage Systems	THE ROLE OF MODULAR BATTERY PACKS IN ELECTRIFICATION SYSTEMS Stephen Irish, Commercial Managing Director, Hyperdrive Innovation
15:15	QUESTION AND ANSWER SESSION	
15:25	NETWORKING REFRESHMENT BREAK	
	HIGH PERFORMANCE CASE STUDIES	
15:55	RANGE EXTENDERS FOR HIGH PERFORMANCE VEHICLE APPLICATIONS Nick Carpenter, Engineering Director, Delta Motorsport	
16:25	BATTERY MANAGEMENT SYSTEMS: EXPANDING THE ENVELOPE Adrian Bell, Principal Engineer Electrical Systems, Williams Advanced Engineering	
16:55	QUESTION AND ANSWER SESSION	
17:05	HOTSPOT DISCUSSIONS: INSIGHTS FROM INDUSTRY SPECIALISTS An opportunity to put your questions to experts in their specialist area. Presenters have 5 minutes to address their chosen area and 5 minutes to answer questions.	
	<ol style="list-style-type: none"> 1. Update on the Faraday Challenge and related government supported activities 2. How industry is using government schemes to support research and developments 3. Overview of the progress being made in industry and vision for industry growth 	
17:35	CHAIR'S CLOSING REMARKS	
17:40	END OF CONFERENCE DAY ONE	
19:00	DINNER AND DRINKS RECEPTION (SUBJECT TO PRE-REGISTRATION)	

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.

PROGRAMME

DAY TWO	WEDNESDAY, 7 NOVEMBER 2018
08:30	REGISTRATION AND REFRESHMENTS
09:00	CHAIR'S WELCOME AND OPENING REMARKS
09:10	KEYNOTE ADDRESS
KEYNOTE	Steven Woolley, Chief Technology Officer, Mahindra Electric
	BALANCING PERFORMANCE, DURABILITY AND COST
09:40	ADVANCES THROUGH COLLABORATIVE INNOVATION
	Anna Wise, Innovation Lead for Batteries, Innovate UK
	APPROACHES TO MANUFACTURING AND MATERIALS
10:10	LITHIUM SUPPLY CHAIN – BATTERY BLOAT OR BOTTLENECKS?
	Nell Agate Tsui, Associate Director Lithium & Battery Materials, IHS Markit
10:40	QUESTION AND ANSWER SESSION
10:55	NETWORKING REFRESHMENT BREAK
11:25	RISING TO THE EV MATERIALS CHALLENGE WITH JOHNSON MATTHEY'S ELNO® CATHODE MATERIAL
	Stuart Johnson, Process Development Manager, Battery Materials, Johnson Matthey
11:55	LITHIUM-ION BATTERY SCALE UP – MATERIALS AND MANUFACTURING INNOVATIONS
	Billy Wu, Senior Lecturer in Energy and Manufacturing, Dyson School of Design Engineering, Imperial College London
12:25	QUESTION AND ANSWER SESSION
12:35	ADDRESSING MATERIALS REQUIREMENTS AND RESOURCE AVAILABILITY IN BATTERY MANUFACTURE
PANEL DISCUSSION	Nell Agate Tsui, Associate Director Lithium & Battery Materials, IHS Markit Stuart Johnson, Process Development Manager, Battery Materials, Johnson Matthey Further panellists to be announced
	<ul style="list-style-type: none"> • A critical look at the requirements of raw materials for battery manufacture • Impact on the global market of resource demand and how the materials industry will build appropriate infrastructure • Measures in place to ensure ethical and sustainable resourcing of materials
13:05	NETWORKING LUNCH
	BATTERY RECYCLING AND SECOND LIFE
14:05	EUROPEAN REMANUFACTURING COUNCIL UPDATE ON BATTERY REMANUFACTURING
	Owain Griffiths, Development Officer, European Remanufacturing Council
14:35	ELECTRIC VEHICLE BATTERY GRADING AND SECOND LIFE APPLICATIONS
	Daniel Gladwin, Senior Lecturer, University of Sheffield
15:05	QUESTION AND ANSWER SESSION
15:15	NETWORKING REFRESHMENT BREAK
	TRANSPORTATION SAFETY AND REGULATION
15:45	THE CHALLENGES IN COMMERCIAL SHIPPING FOR BATTERY TECHNOLOGIES
	Heather Smith, Commercial Manager, Metro Shipping
16:15	THE MECHANICAL IMPACT OF CHEMICAL AND MATERIAL ENGINEERING DEVELOPMENTS
PANEL DISCUSSION	Andreas Pfrang, Scientist, Directorate for Energy, Transport and Climate, Energy Storage Unit, European Commission, DG Joint Research Centre Billy Wu, Senior Lecturer in Energy and Manufacturing, Dyson School of Design Engineering, Imperial College London Further panellists to be announced
	<ul style="list-style-type: none"> • Gaining an understanding of the interface between engineering sectors in furthering vehicle electrification • Insight into the interaction between different engineering functions • The roadmap of battery engineering for the future
16:45	CHAIR'S CLOSING REMARKS
16:50	END OF CONFERENCE

FEEDBACK FROM PREVIOUS EVENTS:

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

Engineering Manager, CAT

“THE QUALITY OF SPEAKERS AND ENSUING DISCUSSIONS WERE HIGH, AND IT WAS A VERY ENGAGING COUPLE OF DAYS. IT WAS VERY INTERESTING TO HEAR OTHER PEOPLE DESCRIBE EXPERIENCING THE SAME ISSUES AS WE ARE FACING”

Electronics and Firmware Engineer,
Lockheed Martin UK

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CO-LOCATED EVENT:

EV INFRASTRUCTURE ENGINEERING

6–7 November 2018, Twickenham Stadium, London

Book onto **International EV Batteries 2018** and upgrade your booking to attend the **EV Infrastructure Engineering seminar** for just £70.

CLARIFYING GOVERNMENT STRATEGIES, ENGINEERING INVESTMENTS, NEW TECHNOLOGIES AND THE INTERACTION WITH LOCAL AUTHORITIES IS VITAL IN DELIVERING A ROBUST CHARGING NETWORK THAT IS FIT FOR PURPOSE.

Gain insights on plans to make this a reality from Ofgem, OVO Energy, Shell Global Retail, Vattenfall, Zero Carbon Futures, Horizon Power and Energy and others. Hear case studies from local authorities on the role of engineers in facilitating these infrastructure projects. Address the challenge of reinforcing the grid and meeting future charging demand, as well as the role of Vehicle to Grid charging.

WEDNESDAY, 7 NOVEMBER 2018	
08:30	REGISTRATION AND REFRESHMENTS
	THE INTERNATIONAL BATTERY MARKET
09:00	CHAIR'S WELCOME AND OPENING REMARKS
09:10	INSIGHTS FROM GOVERNMENT: SUPPORTING THE GROWING REQUIREMENT FOR ELECTRIC VEHICLES Chris Brown, Head of EST Strategy & Emerging Issues Systems & Networks, Ofgem
09:40	THE NECESSITY AND CONDITION VIABILITY OF INTELLIGENT FLEXIBILITY PLATFORMS Kotub Uddin, Head of Research, OVO Energy
10:10	THRIVING IN THE EV REVOLUTION Toby Butler, Head of Portfolio and Innovation, Shell Global Retail
10:40	QUESTION AND ANSWER SESSION
10:55	NETWORKING REFRESHMENT BREAK
	LOCAL AUTHORITY CASE STUDIES
11:25	CASE STUDY: LESSONS LEARNT IN TRIAL CITY-WIDE EV CHARGE POINT NETWORK Colin Herron CBE, Managing Director, Zero Carbon Futures, Future Technology Centre
11:55	WHERE, WHEN AND HOW MUCH: DEVELOPMENT OF A LOCAL AUTHORITY EV CHARGING INFRASTRUCTURE STRATEGY Ernie Shelton, Director, Horizon Power and Energy Ltd
12:25	QUESTION AND ANSWER SESSION
12:35 PANEL DISCUSSION	ELECTRIC MOBILITY AND THE CHANGING ROLE OF LOCAL AUTHORITIES Colin Herron CBE, Managing Director, Zero Carbon Futures, Future Technology Centre Olivier Freeling-Wilkinson, Cofounder, Urban Electric Anthony Hinde, Director, Sales and Operations, E-Mobility, InCharge Solutions, Vattenfall
13:05	NETWORKING LUNCH
	MEETING CHARGING REQUIREMENTS
14:05	AN EV FOR EVERYONE: BUT HOW WILL WE CHARGE THEM ALL? Stephen Voller, CEO, ZapGo Ltd
14:35	WHAT DOES THE FUTURE LOOK LIKE FOR EV CHARGING IN THE UK? Alan McCleave, General Manager UK, NewMotion
15:05	QUESTION AND ANSWER SESSION
15:15	NETWORKING REFRESHMENT BREAK
15:45	VEHICLE TO GRID: ADDRESSING THE CHALLENGES Anthony Hinde, Director, Sales and Operations, E-Mobility, InCharge Solutions, Vattenfall
16:15	QUESTION AND ANSWER SESSION
16:20 PANEL DISCUSSION	THE INTERFACE BETWEEN ENGINEERS, LEGISLATORS AND CONSUMERS IN THE ROAD TOWARDS ELECTRIC MOBILITY James McKemey, Head of Insights Team, Pod Point Ltd Stephen Voller, CEO, ZapGo Ltd Further panellists to be announced
16:50	CHAIR'S CLOSING REMARKS
17:00	END OF SEMINAR

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INTERNATIONAL EV BATTERIES 2018: COST-EFFECTIVE ENGINEERING FOR HYBRID AND ELECTRIC VEHICLES

6–7 November 2018, Twickenham Stadium, London

INTERNATIONAL EV BATTERIES 2018 WILL BRING YOU CUTTING- EDGE TECHNICAL UPDATES FROM OEMS, RESEARCHERS AND REGULATORS.

Hear from mechanical engineers on how they are cost-effectively **increasing range, guaranteeing performance and ensuring durability and range** of electric and hybrid vehicles. Understand how industry is planning to meet future demands on **material resourcing, manufacturing, recycling and second life** of EV and HEV batteries.

Join industry leaders including **Williams Advanced Engineering, Jaguar Land Rover and Mahindra Electric** as they reveal their engineering approaches to engineering challenges. Hear from the **European Commission** and the **European Manufacturing Council** and learn how they are shaping the rapidly evolving global market. Understand how **Innovate UK** and the **Faraday Challenge** are driving new UK efforts to make the UK a world leader for battery technologies.

Engage with experts across the batteries industry, at **speed networking** and arranging **one-to-one meetings** using our unique networking tool. Take the opportunity to connect with experts in our **shared exhibition space** alongside the **EV Infrastructure Engineering** seminar.

KEY PROGRAMME HIGHLIGHTS:

- **Jaguar Land Rover** and **ThermoAnalytics** address the thermal management of automotive battery packs
- **Ricardo Innovation, Cidetec** and **Hyperdrive Innovation** provide insights on modular battery pack design
- **Johnson Matthey, IHS Markit** and **Imperial College London** explore the role of materials in battery manufacturing and meeting industry demands
- The **European Manufacturing Council** and the **University of Sheffield** discuss battery recycling and second life applications
- Benefit from cross-industry learning by finding out more about **aerospace and marine applications of hybrid technologies**

ATTEND THIS CONFERENCE TO:

- Hear from **vehicle OEMs, tier one manufacturers, researchers and regulators** on the cutting-edge technology for EV Batteries
- Understand the direction of UK industry and how this fits in to the global market with contributions from **Innovate UK** and the **European Commission**
- Engage in **interactive panel discussions** addressing key industry challenges including materials resources, the interface between different engineering functions, and the future of the UK industry
- Unique access to innovators, though leaders and budget holders in our networking breaks, including **speed networking and infrastructure experts from our co-located EV Infrastructure Engineering seminar**

TECHNICAL ADVISORY COMMITTEE:

Paul McNamara, Technical Director
Williams Advanced Engineering

Michael Parkes, Project Lead e-mobility
Shell

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

Steve Doyle, Product Group Head,
Hybrid & Electronic Systems Business Unit
Ricardo

John Turton
Independent Aerospace Engineering Professional

Mike Richardson, Former Chief Technical Specialist,
Low Carbon Vehicles
Jaguar Land Rover (retired)

WITH THANKS TO:

Powertrain Systems and Fuels Group
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FEES AND CHARGES

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

Delegate Type	STANDARD RATE
Member, Institution of Mechanical Engineers / Supporting Organisation	£419 + VAT = £502.80
Non-member	£619 + VAT = £742.80
Student/Retired	£319 + VAT = £382.80
Attend the International EV Batteries Networking Dinner at the end of Day 1	£65 + VAT = £78
Upgrade your International EV Batteries booking to attend the co-located EV Infrastructure Engineering seminar on 7 November 2018	£70 + VAT = £84

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

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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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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.

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1 Birdcage Walk
Westminster
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SW1H 9JJ

T +44 (0)20 7222 7899
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OTHER EVENTS TO LOOK FOR



THE INSTITUTION OF MECHANICAL ENGINEERS' ANNUAL DINNER 2018

22 November 2018, Bristol

Join the Institution in celebration of engineering excellence – and in particular 50 years of supersonic travel – at the newly-opened museum Aerospace Bristol, housing the final Concorde ever built, which will provide the spectacular backdrop for a memorable night of networking and fine dining.

www.imeche.org/annualdinner



FUEL SYSTEMS - ENGINES

4–5 December 2018, London

Hear the latest technology for state-of-the-art system design, characterisation, measurement, and modelling, addressing all technological aspects of diesel and gasoline fuel injection systems.

www.imeche.org/fuelsystems2018

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