

# FPC2014

Future Powertrain Conference

19-20 February 2014

National Motorcycle Museum,  
Solihull

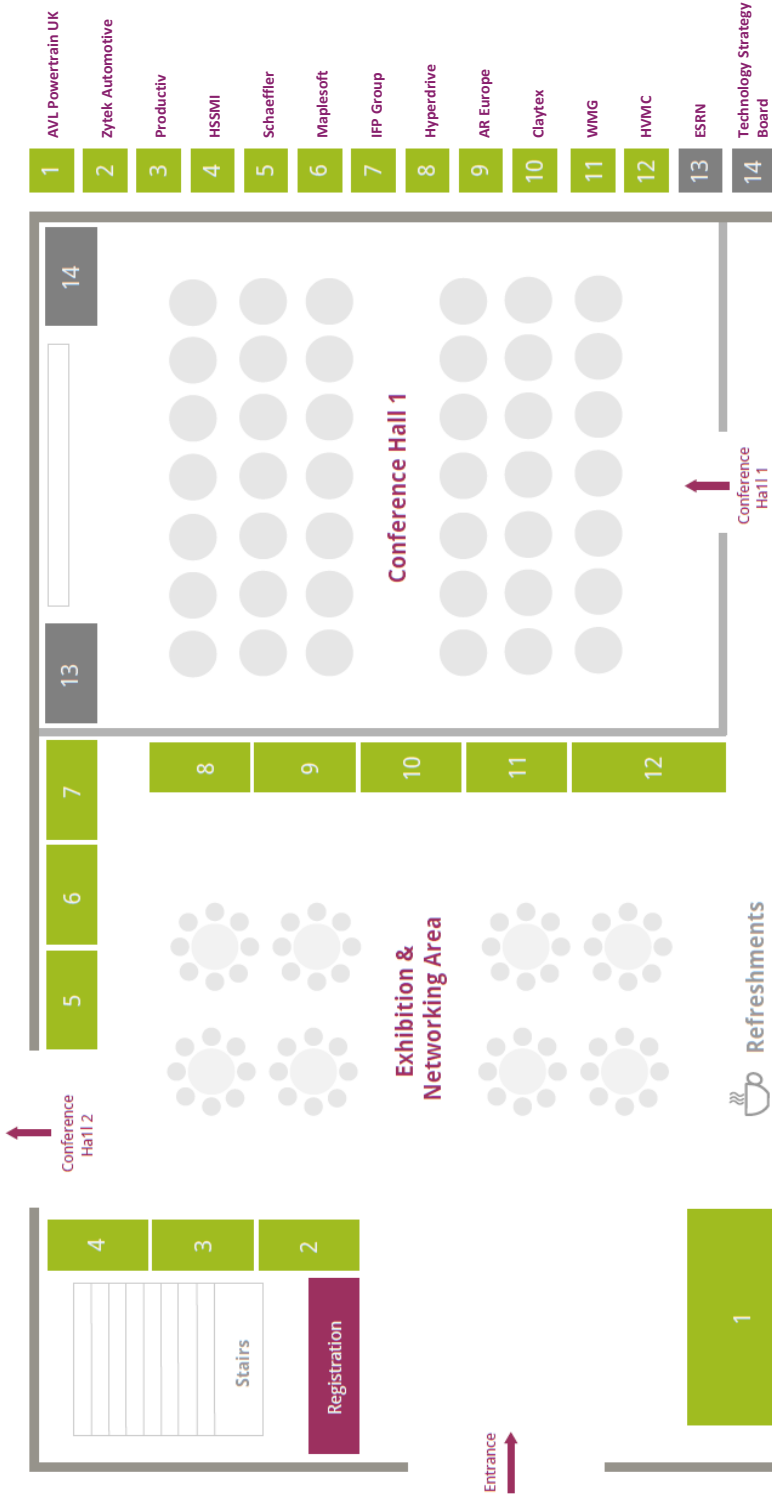


conference programme



Imperial College  
London

# venue layout



# FPC2014

## Future Powertrain Conference

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Organised in partnership by:



Imperial College  
London

With special thanks to:





Welcome to the inaugural **Future Powertrain Conference**. We hope you find these two days to be exciting, informative and engaging, with a wealth of expertise being presented by over 50 industry-leading chairs and speakers.

With multiple pressures pushing the industry to meet ever tighter emission regulations, the need to develop and implement new technology is increasing all the time. The inherent risks can only be mitigated by a better understanding of the technology.



To help strengthen the UK engineering community and to meet this challenge the Future Powertrain Conference is being launched to bring together and help bridge the gap between scientists and engineers from the UK's leading academic institutions and the best of the UK's industry.

**Prof Nigel Brandon**  
Imperial College London

**Prof Matthias Wellers**  
AVL Powertrain UK

## Wednesday 19<sup>th</sup> February 2014

8:30	Registration Open	
9:00	Welcome	
9:30	Morning Keynote Bob Joyce - Jaguar Land Rover	
10:00	<i>Hall 1 – Session A1</i> Emissions Legislation - Future Challenges and Trends	<i>Hall 2 – Session A2</i> HD - Tier 4 & Beyond
12:00	Lunch & Networking	
13:00	Afternoon Keynote Jon Horsley, Technology Strategy Board	
13:30	<i>Hall 1 – Session B1</i> Fuels, Lubricants & Gas	<i>Hall 2 – Session B2</i> Hybrid - The Way Forward
15:30	Refreshment Break & Networking	
16:00	<i>Hall 1 – Session C1</i> Downsizing - DI & Turbo	<i>Hall 2 – Session C2</i> Batteries
19:00	Evening Network Event Evening Keynote: Jerry Hardcastle OBE, Nissan Motor Company	

## Thursday 20<sup>th</sup> February 2014

8:30	Refreshments	
9:00	Morning Keynote Michael Hurwitz, Department for Transport	
9:30	<i>Hall 1 – Session D1</i> Powertrain Transmission	<i>Hall 2 – Session D2</i> Electric Machines
11:30	Lunch & Networking	
12:00	Afternoon Keynote Tony Pixton, Advanced Propulsion Centre	
12:30	<i>Hall 1 – Session E1</i> Manufacturing	<i>Hall 2 – Session E2</i> Power Electronics & Control
14:30	Refreshment Break & Networking	
15:00	<i>Hall 1 – Session F</i> Safety & Public Perception	
17:00	Closing Summary Dr Greg Offer, Imperial College London	



## **Bob Joyce**

Day 1, 9:30, Main Hall

### ***Future Powertrains for luxurious and sporting vehicles in a sustainable world***

Bob Joyce is Group Engineering Director of Jaguar Land Rover and a member of the Executive Management Team. An Engineering graduate of Leicester University, Bob has held positions as Chief Engineer at Rover, Director Gaydon Technology Centre, Director Rover Body & Pressings, and Senior Vice President BMW. He joined Ford Motor Company in 2001, and at Jaguar Land Rover he has overseen the development of the complete range of new vehicles including Range Rover, Discovery 4, Range Rover Sport, Freelander 2, Jaguar XK, XF, XJ and the new Land Rover Evoque.

## **Jon Horsley**

Day 1, 13:00, Main Hall

### ***Supporting Powertrain Innovation in the UK***

Jonathan Horsley is the Lead Technologist for the Low Carbon Vehicles Innovation Platform within the Technology Strategy Board. Prior to joining the TSB he was a self-employed carbon reduction consultant, having read a Carbon Management MBA at University of East Anglia in 2008. Before then he held a number of posts involved with powertrain development over a 17-year employment with ZYTEK, including leading the EV/HEV group from 1998-2002.



## **Jerry Hardcastle OBE**

Day 1, 19:20, Evening Social

Jerry Hardcastle is Nissan's Global Chief Marketability Engineer, and also holds the role of Technical Director for Global Motorsports. Jerry has been working in the automotive industry for 29 years holding positions in design and development with Austin Rover Group and Nissan Motors Limited.

## Michael Hurwitz

Day 2, 9:00, Main Hall

Michael Hurwitz is Director, Energy, Technology & International at the Department for Transport. He is responsible for putting the UK's transport energy onto a sustainable footing, and promoting the associated economic opportunities for the UK. He also oversees development of the DfT's international relations, with the EU and wider world. In 2011 he was appointed a Policy Fellow at the Energy Futures Lab, Imperial College London.



## Tony Pixton

Day 2, 12:00, Main Hall

Tony Pixton has been Managing Director for Tony Pixton Consulting Limited since 2012. Between 2009 and 2012 he was Representative Director and Assistant to the President at Mazda in Japan, Chairman of the Board at Auto Alliance International in the USA and Member of the Board at Auto Alliance Thailand. Before this, he held roles as Executive Director of Product Development at Ford UK from 2006 to 2009, Platform Director in R&D at Volvo in Sweden from 2003 to 2006 and Director of Product Development at Ford Werke AG in Germany from 2000 to 2003.

## A1 - Emissions Legislation - Future Challenges and Trends

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Day 1, 10:00, Hall 1

**Chair:** Kieran McAleer, AVL Powertrain UK

**Speaker:** Martin Joyce, Changan

*The challenges facing OEM in the Chinese Market*

**Speaker:** Grant Cairnie, AVL Powertrain UK

## A2 - HD – Tier 4 & Beyond

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Day 1, 10:00, Hall 2

**Chair:** Robin Woodward, Caterpillar Industrial Power Systems

**Speaker:** Robin Woodward, Caterpillar Industrial Power Systems

*Customer Focused Stage 5 Engine Considerations*

**Speaker:** Dr Ben Reid, Loughborough University

*Optical Diagnostics Tools for Heavy Duty Engine System Design*

**Speaker:** Mikael Larsson, Johnson Matthey

*After treatment solutions for Tier4 and beyond*

## B1 - Fuels, Lubricants & Gas

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Day 1, 13:30, Hall 1

**Chair:** Richard Pearson, BP

**Speakers:** Ben Leach and John Williams, BP

*Fuel synergies and effects with downsized gasoline engines*

**Speakers:** Oliver Taylor and Chris Warrens, Castrol

*Fuel Economy Through Lubricants*

**Speaker:** Steve Whelan, Clean Air Power

*Heavy Duty Truck Dual-Fuel Powertrain*



## B2 - Hybrid – The Way Forward

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Day 1, 13:30, Hall 2

**Chair:** Dr Mike Richardson, Jaguar Land Rover

**Speaker:** David Greenwood, Ricardo  
*Hybridisation for Performance and Economy*

**Speaker:** Dave Tickle, Jaguar Land Rover  
*Range Rover Hybrid Vehicle Delivery Challenges*

**Speaker:** Prof Francis Assadian, Cranfield University  
*The impact of optimisation in addressing the challenges of future hybrid powertrains*

## C1 - Downsizing – DI & Turbo

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Day 1, 16:00, Hall 1

**Chair:** Dr Ricardo Martinez-Botas, Imperial College London

**Speaker:** Prof Jamie Turner, Jaguar Land Rover  
*Ultraboost: Investigations into the Limits of Extreme Engine Downsizing*

**Speaker:** Colin Copeland, University of Bath  
*Challenges to the boosting system for extreme downsizing*

**Speaker:** Dr Srithar Rajoo, Universiti Teknologi Malaysia  
*Pulsating flow impact on turbocharger turbines*

**Speaker:** Rik Alewijnse, AVL  
*Cooling of Turbo-GDi engines*

## C2 - Batteries

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Day 1, 16:00, Hall 2

**Chair:** Dr Gregory Offer, Imperial College London

**Speaker:** Nigel Taylor, Jaguar Land Rover  
*The pursuit of Powertrain Operational Excellence*

**Speaker:** Dr Uwe Wiedemann, AVL Powertrain UK  
*Safe and reliable batteries for xEV's*

**Speaker:** Monica Marinescu, Imperial College London  
*Challenges in battery pack design, management & engineering*

## D1 - Powertrain Transmission

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Day 2, 9:30, Hall 1

**Chair:** Michael Gallion, AVL Powertrain UK

**Speaker:** Alex Tylee-Birdsall, Drive System Design

*High efficiency electric vehicle powertrain*

**Speaker:** Clive Crewe, AVL Powertrain UK

*Future Transmission outlook and the implications for calibration*

## D2 - Electric Machines

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Day 1, 9:30, Hall 2

**Chair:** Dr David Howey, Oxford University

**Speaker:** Rafal Wrobel, Bristol University

*Losses in electric propulsion motors and how to reduce them*

**Speaker:** Chris Gerada, Nottingham University

*High Performance Electrical Machines for Electrical Propulsion*

**Speaker:** James Goss, Motor Design Ltd

*Analysis of Electric Machines for Automotive Applications*

*Considering Complex Driving Cycles*

## E1 - Powertrain Transmission

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Day 2, 12:30, Hall 1

**Chair:** Michael Thompson, Ford

**Speaker:** Nigel Blenkinsop, Jaguar Land Rover

*The Pursuit of Powertrain Operational Excellence*

**Speaker:** Leslie Lee, HSSMI

*Virtual Engineering Requirements - A Manufacturing SME Perspective*

**Speaker:** Prof Robert Harrison is University of Warwick

*Creating Future Powertrain Manufacturing Capability: An Automation Perspective*

## E2 - Power Electronics & Control

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Day 2, 12:30, Hall 2

**Chair:** Prof Phil Mawby, Warwick University

**Speaker:** Prof Volker Pickert, Newcastle University  
*In-situ health monitoring for power electronics modules*

**Speaker:** Prof Andrew Forsyth, Manchester University  
*Challenges for On-Board DC-DC conversion*

**Speaker:** Steve Neill, Infineon Technologies  
*Product to system (P2S) - and what it means to us*

## F - Safety & Public Perception

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Day 2, 15:00, Hall 1

**Chair:** Matt Loader, Nissan Europe

**Speaker:** Prof Ingmar Posner, University of Oxford  
*Driving Autonomy - Why Autonomous Cars Need Introspection*

**Speaker:** Prof Vladimir Molkov, University of Ulster  
*Hydrogen safety engineering : what do we know & what are key issues to be resolved*

**Speaker:** Dr Valentina Gentili, JM Battery Systems  
*Judgement rather than perception: xEV Battery Safety*



## **AVL Powertrain UK Organiser & Sponsor**

AVL is the world's largest independent company for the development of powertrain systems with internal combustion engines as well as instrumentation and test systems. It specialises in development, stimulation and testing technology of powertrains (hybrid, combustion engines, transmission, electric drive, batteries and software) for passenger cars, trucks and large engines. The high-tech company AVL employs 5,250 people worldwide.



## **Energy Storage Research Network Organiser & Sponsor**

The Energy Storage Research Network ([esrn.co.uk](http://esrn.co.uk)) is an EPSRC-funded project led by Professor Nigel Brandon at Imperial College London. It brings together researchers from academic, industrial and policy domains with an interest in energy storage and its application to future low carbon energy systems.



## **Zytek Premium Supporter & Exhibitor**

Zytek is a specialist automotive engineering consultancy, delivering product and project innovation to vehicle manufacturers and tier one suppliers in the global automotive industry. Zytek also manufacture electric drive systems from 25kW – 170kW, delivering either off the shelf standalone electric machines or inverters for use in hybrid or electric vehicles, or developing, custom, value driven, turnkey solutions, to meet any full electric or hybrid application.



## HSSMI Poster Sponsor & Exhibitor

The High Speed Sustainable Manufacturing Institute (HSSMI) is a research and technology development organisation providing advanced manufacturing research, new product development, engineering and commercialisation advisory services. Part-funded by Olympic legacy money, the HSSMI takes the engineering ideas born in British universities and turns them into commercial, sustainable and ready-to-use manufacturing innovations.

**SCHAEFFLER**



## Schaeffler Social Sponsor & Exhibitor

Schaeffler's close partnership with the world's leading automotive manufacturers has led to the development of many innovative engine, chassis & transmission components and systems. Our engineering expertise is now being successfully applied to deliver significant improvements in fuel economy and CO2 emissions, with our latest award-winning products being the key to commercially successful low carbon powertrain designs.



## WMG & HMV Catapult Exhibitor

The WMG centre HVM Catapult works collaboratively with business to transfer cutting-edge research into the marketplace, strengthening the UK's manufacturing economy. Research themes are Lightweight Technologies Design and Energy Storage & Battery characterisation.



## AR UK Ltd Exhibitor

AR UK Ltd specialise in the supply of test equipment and turnkey systems for a wide range of applications including EMC, RF & Microwave, Electrical Safety and Power Electronics. Representing AeroVironment for Power Cycling Systems, Associated Research & Slaughter for Electrical Safety Equipment and Associated Power Technologies AC Power Sources.



## Technology Strategy Board Supporter

The Technology Strategy Board is a key supporter of FPC2014. As the UK's innovation agency, our role is to work with UK business to accelerate technology orientated innovation. In partnership with government departments and research councils, the Technology Strategy Board is working with the UK automotive business to drive innovation in areas with the greatest scope for boosting sustainable growth and productivity, vital to the UK's future economy.





## Northwest Automotive Alliance Supporter

The NAA is an independent, not-for-profit company which provides a membership service combined with a project management delivery function to the automotive community, supporting micro-companies through to the locally-based global vehicle manufacturers. The NAA's Business Excellence programme works with member companies to help them improve their performance.



## Green Car Guide Supporter

Green-Car-Guide.com aims to provide information to consumers about the latest green cars in a quality, informed and engaging way. The site focuses on cars that are best in class in terms of emissions, fuel economy and efficiency, but that are also great to drive.



## HMV Catapult Exhibitor

The High Value Manufacturing Catapult is the catalyst for growth and success of high value manufacturing in the UK through a partnership of government and industry. Its long-term goal is to stimulate growth in the sector by helping businesses and research institutions accelerate new concepts to commercial reality.



## Claytex Exhibitor

Claytex is an engineering consultancy and provider of simulation tools. We specialise in Systems Engineering using Modelica and related tools and processes. We are distributors of Dassault Systemes portfolio of Systems Engineering tools which includes Dymola, Reqtify and AUTOSAR Builder. Our customers include some of the world's most respected Automotive and Motorsport companies and we have dedicated solutions for powertrain modelling and simulation.



## Hyperdrive Innovation Exhibitor

Hyperdrive Innovation develops powertrain systems for electric, hybrid and conventionally powered vehicles that enhance vehicle performance, optimise energy efficiency and reduce carbon emissions. As a dynamic technology-led business, they provide electronic products and engineer integrated vehicle drive systems for clients working in automotive, industrial, defence and marine applications.



## Maplesoft Exhibitor

Maplesoft's core technologies include the most advanced symbolic computation engine and revolutionary physical modelling techniques. Combined, these technologies enable the creation of cutting-edge tools for design, modelling, and simulation. The Maplesoft product suite includes Maple, the technical computing and documentation environment, and MapleSim, the high-performance, multi-domain modelling and simulation tool for physical systems.



## IFP Group Powertrain Technologies Exhibitor

IFP Group Powertrain Technologies is an integrated offer proposed by IFP Energies nouvelles (IFPEN) and his subsidiary D2T Powertrain Engineering including a range of technologies, products and services in the fields of transport. This offer provides a comprehensive, joint service with each entity operating in its specific area of expertise, ranging from research and the development of concepts to the integration in industrial applications, including the production of prototypes and small series manufacturing.



## Productiv Exhibitor

Productiv bridges the gap between small enterprises developing leading edge low carbon technology and large vehicle manufacturers. By providing technical, production and commercial development, we deliver the economies of scale the automotive industry needs at the low volumes necessary, enabling vehicle manufacturers and other Original Equipment Manufacturers (OEMs) to access new technology from outside the established supply chain.



## Transport KTN Supporter

With increasing fuel costs, and ever more stringent regulations governing emissions at all stages of product lifecycles, energy efficiency is a key consideration for all transport systems. The Transport KTN facilitates technology and expertise development and exchange in key areas that contribute to overall and specific energy efficiency measures, throughout all transport sectors and beyond.

# FPC 2014

## Future Powertrain Conference

### Co-Partners



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London

### Supporters & Exhibitors



Technology Strategy Board  
Driving Innovation



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For support on the day please call 07709293627

[www.futurepowertrains.co.uk](http://www.futurepowertrains.co.uk)