



SMMT OPEN FORUM

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Paul Everitt

New Automotive Innovation & Growth Team (NAIGT)



Background

- NAIGT formed April 2008
- Industry-led project facilitated by BERR's Automotive Unit
- Tasked with looking at:
 - opportunities for automotive sector in the UK
 - barriers and obstacles for realising these opportunities
 - strategy and mechanisms for accelerating progress

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The motor industry

- Global market growing at 2.5% pa, much faster in developing countries
- Huge contributor to manufacturing sector – 1/8th of the manufacturing in the UK is auto-related
- Innovator whose ideas often become the standard for other industries – moving production line, just-in-time inventories, flexible lean production, total preventative maintenance
- Cars account for 90% of all travel – they are here to stay and the industry is embracing the low carbon challenge

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The UK motor industry today

- An industry that has transformed itself in the last decade and is now competitive with global peers
 - Outstanding quality and reliability
 - Excellent labour relations and labour flexibility
 - World class productivity
 - Strong R&D
 - Diverse manufacturer representation
- Embracing the low carbon challenge
- But sub-competitive scale and hollowing out of employment and structure continuing

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UK motor industry strengths

- Competitive scale on engine production
- Labour Flexibility
- Strong premium brands – second only to Germany globally
- Diverse representation of manufacturers

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UK motor industry weaknesses

- No global major headquartered in UK
- Sub-critical scale for car production and R&D
- Tier 1 suppliers only assemble – no R&D or core component manufacturing
- Limited R&D by global majors especially Tier 1 suppliers
- Ambivalent Government historically

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UK motor industry opportunities

- Halt the 'hollowing-out' process
- Take advantage of the technology revolution that is needed to transform the car fleet to very low carbon emissions
- Pro-active strategic collaboration between industrial players and Government
- Encourage OEMs and Global Tier 1 suppliers to increase R&D in the UK

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NAIGT Vision for the future

- A competitive, growing and dynamic industry making a large and increasing contribution to employment and prosperity in the UK, and playing a decisive global role in developing exciting, low carbon vehicle transportation solutions

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Overarching 'Big Ideas'

- **An Automotive Council**
 - A collaborative industry and Government strategic steering partnership to build a stronger UK auto sector
- **Industry Consensus Technology Roadmap**
 - To drive Collaborative R&D efforts and harness Government investment more effectively

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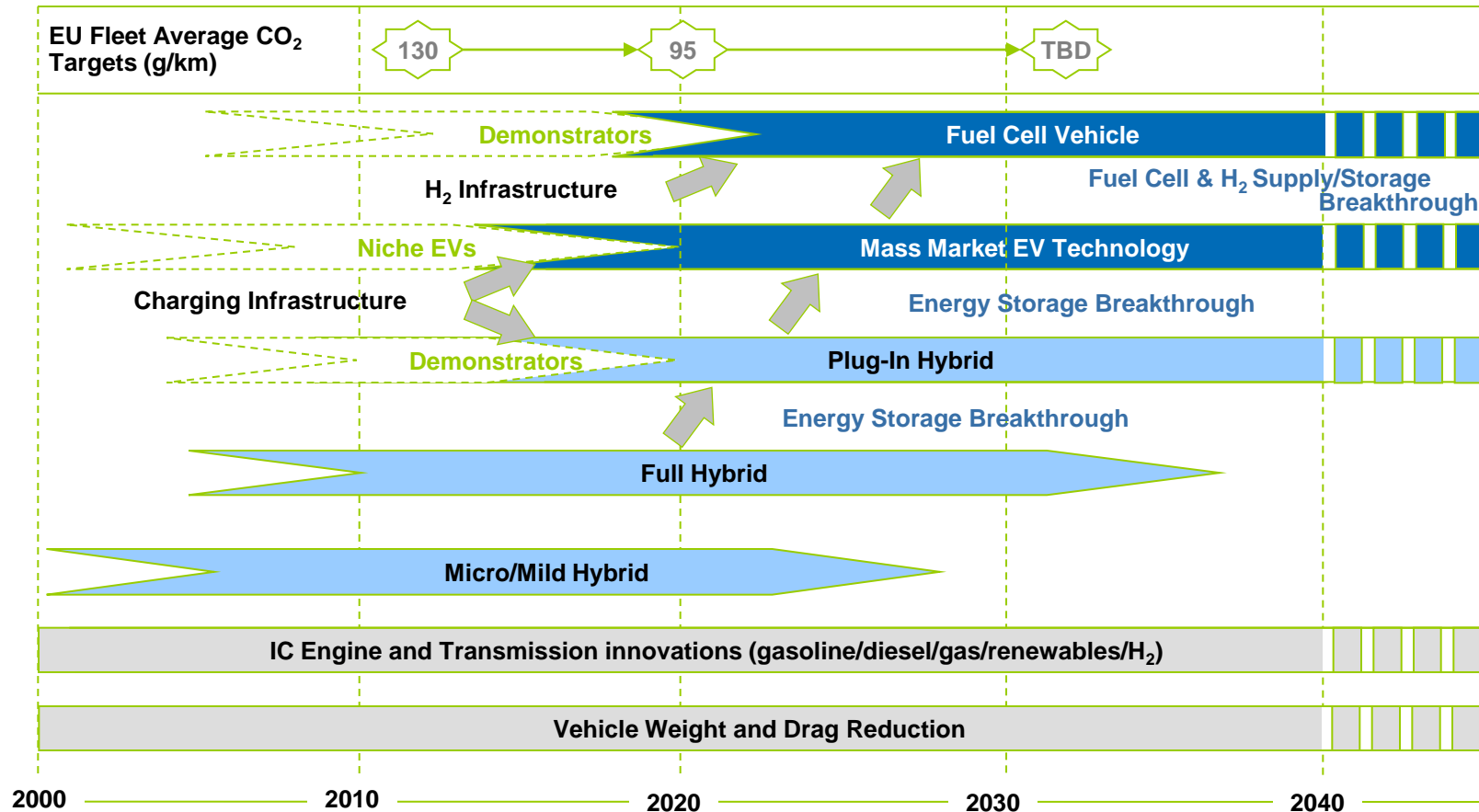


Overarching 'Big Ideas'

- **Test Bed UK**
 - A bold low carbon vehicle system pilot to act as a powerful catalyst for UK investment
- **Supplier Help**
 - Establish a UK supply chain council to improve collaboration and develop a sourcing roadmap
 - Establish a Manufacturing Institute to help leverage R&D and Manufacturing technology

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Technology Road Map



The Consensus Product Roadmap describes the future direction to develop Low Carbon technology products

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Technology Road Map (Message)

- OEMs share a common product technology roadmap and recognise the same technical and commercial barriers.
- Individual manufacturers will implement technologies which best address their own brand values and market sectors.
- In the near to medium term, improvement of conventional powertrains and transmissions can have a significant impact on fleet average CO2 by providing moderate benefits for a large proportion of the fleet.
- In the medium to longer term it is anticipated that a technology shift to alternative powertrains and transmissions will be required to achieve the CO2 reduction targets from transport. Supported by alternative fuel delivery including grid electricity and hydrogen.
- Both electrification and fuel cell vehicle technologies rely on the concurrent development of a “clean and sustainable” supply of energy



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Research Road Map

	SHORT TERM 5 – 10 years from production	MEDIUM TERM 7 – 15 years from production	LONG TERM 10 – 20 years from production
	INDUSTRY		UNIVERSITIES
Propulsion	<ul style="list-style-type: none"> IC engine optimisation Boost systems for downsizing Flexible valve/actuation for engines/transmissions Low cost compact e-motors 	<ul style="list-style-type: none"> Higher efficiency IC engines Capacitive boost systems All electric actuation systems Optimised range extender engine Lower cost e-motor Heat energy recovery (e.g. E-turbine) 	<ul style="list-style-type: none"> Super high efficiency motors (superconducting) New IC engines with 70%+ thermal efficiency Advanced heat energy recovery (e.g. thermoelectric) Motor/Fuel Cell materials
Energy Storage	<ul style="list-style-type: none"> Improved quality / durability 200+ Wh/kg & \$800/kW.h cost battery systems Low cost power electronics 	<ul style="list-style-type: none"> Next gen batteries 300+ Wh/kg and \$500/kW.h cost Flexible power elec. modules Other forms of energy recovery (mechanical/chemical etc) 	<ul style="list-style-type: none"> 3rd gen batteries 400+ Wh/kg & \$200/kW.h cost New low cost solid state power conversion systems Hydrogen storage technology
Vehicle Efficiency	<ul style="list-style-type: none"> Lightweight structures and interiors Low rolling resistance tyres / brakes 	<ul style="list-style-type: none"> New vehicle classes and configurations Combination of function to reduce weight / cost Minimised weight / losses 	<ul style="list-style-type: none"> Flexible re-configurable multi-utility vehicle concepts 50% weight reduction from 2008 Advanced aerodynamic concepts
System Control	<ul style="list-style-type: none"> Information enabled control (Topology, V2V, V2I, traffic etc.) Optimised vehicle energy mgmt. Intelligent thermal management 	<ul style="list-style-type: none"> Advanced information enabled control Intelligent P/T and HVAC mgmt. 	<ul style="list-style-type: none"> Autonomous P/T and vehicle control integrated with active safety
Energy + Fuel Supply	<ul style="list-style-type: none"> Optimised 1st gen biofuels processes New 2nd gen biofuel processes 	<ul style="list-style-type: none"> Intelligent energy / re-fuelling infrastructure (e.g. fast charge) Industrial scale demonstration of new 2nd gen biofuel processes 	<ul style="list-style-type: none"> 3rd gen biofuel processes 2nd gen industrial scale biofuel production infrastructure
Processes + Tools	<ul style="list-style-type: none"> Process + delivery tool development and connectivity 	<ul style="list-style-type: none"> Auto-optimisation methods using virtual systems 	<ul style="list-style-type: none"> Artificial Intelligence to deliver complex multi-criteria system optimisation

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Test Bed UK

Government –
Local and central

Finance sector

Infrastructure
Providers

Consumers

Automotive
OEMs

Academic &
Technical
Institutions

Suppliers



Test Bed UK would be responsible for managing the major activities within NAIGT roadmaps. Programmes such as Electrification of Transport would be developed within the brand.

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Test Bed UK (Message)

- To create a formal partnership mechanism between automotive manufacturers, infrastructure providers, regulators and consumers
- Business model innovation is at least as important as technology innovation
- Need to lead the development of new customer/user behaviours to get best out of new technologies
- Gives UK Ltd a voice in advanced technology development e.g. standards, regulations
- Potential to become skills centre

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Test Bed UK (Message)

- Outlet for research institutes to demonstrate capability to industry
- UK transport market is distinct and separate from other European markets and so has the potential to lead Europe in development of new transport models
- Allows UK to collaborate with other global "demonstrator" projects
- Promotes partnerships that do not currently exist