New Automotive Innovation and Growth Team (NAIGT)

Launch of Final Report

6 May 2009

New Automotive Innovation & Growth Team (NAIGT)

Agenda

10.30-10.35	Welcome & introduction - Richard Parry-Jones
10.35-10.40	Ian Pearson, Economic and Business Minister, BERR
10.40-10.50	NAIGT in context - Richard Parry-Jones
10.50-11.10	Key recommendations from the NAIGT Expert Groups

- The UK Automotive Sector – Matthias Holweg, Judge Business School, University of Cambridge
- A positive and supportive business environment – Richard Parry-Jones
- Technology & low Carbon – Jerry Hardcastle, Nissan
- A stronger and more competitive supply chain – Jon King, Corus

11.10-11.30	Q & A session - Panel chaired by Richard Parry-Jones

New Automotive Innovation & Growth Team (NAIGT)

Ian Pearson

Economic and Business Minister

Department for Business Enterprise and Regulatory Reform (BERR)

NAIGT in context

Richard Parry-Jones

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

The car 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

The UK car 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

UK car industry strengths

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

UK car 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

UK car 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

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

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

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

Key recommendations from the Expert Groups

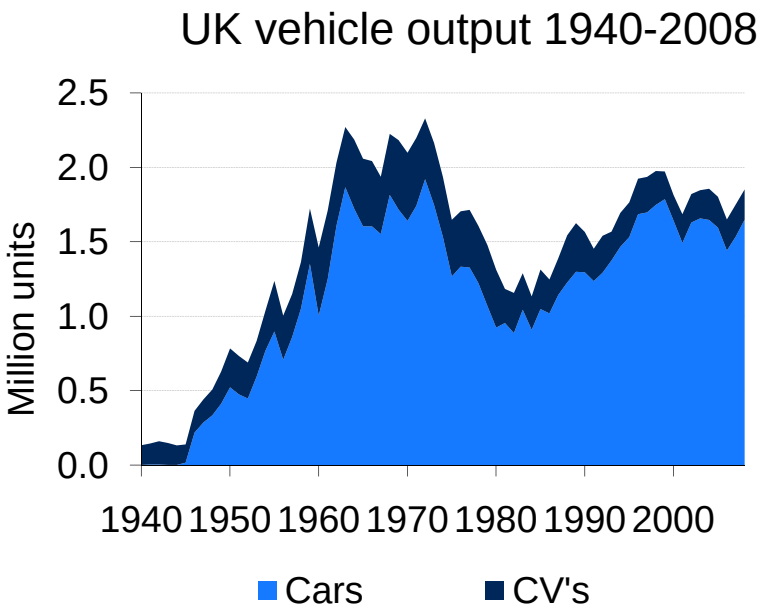
The UK Automotive sector

Matthias Holweg

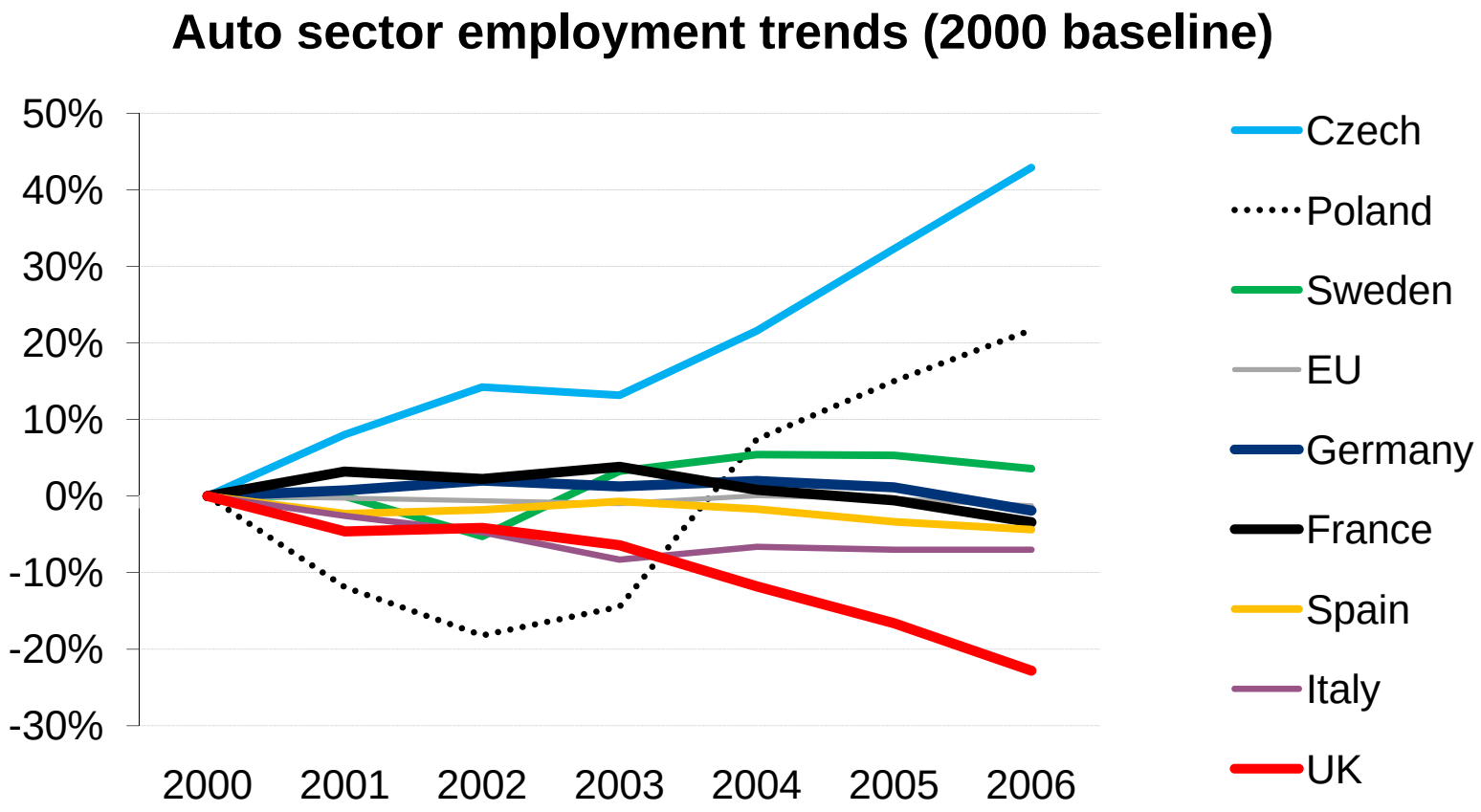
Judge Business School, University of Cambridge

Analysis of trends, trajectories and industry leaders' perceptions to ground NAIGT work

- Sector adds £9.5bn to the economy
  - **0.8%** of UK economy
  - **0.6%** of UK employment
  - **13%** of manufactured exports
- Direct UK employment
  - Job multiplier of **8.5**
  - **384,000** direct employment, of which **330,000** could be offshored
- Shift from volume cars to niche vehicles and engines
- UK is competitive in terms of labour cost and productivity



Shifts in global manufacturing footprint; UK is loosing out disproportionately

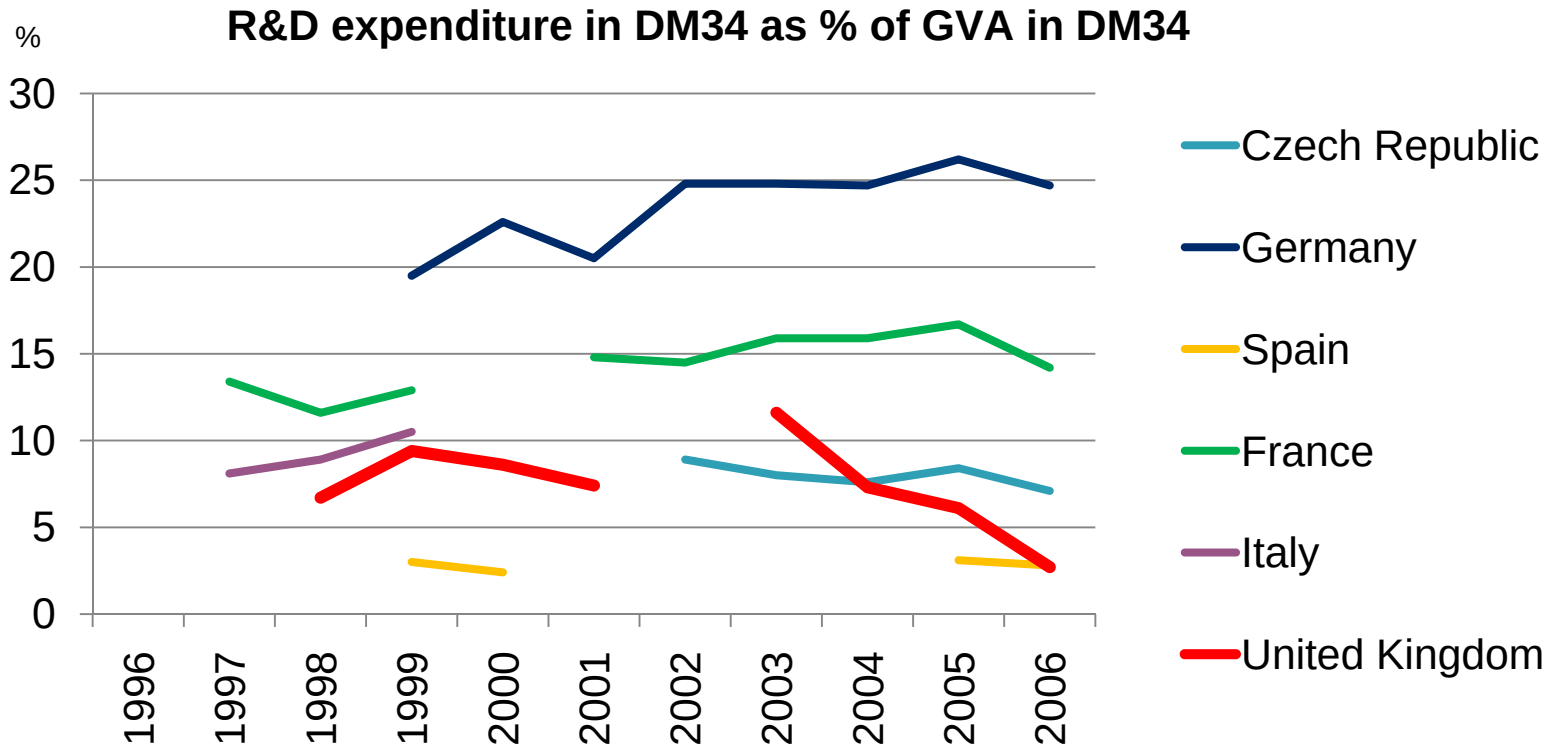


Flexible labour and capacity are UK's main advantage, but mark a double-edged sword

Industry Leaders' perception of the UK's relative strength vs France, Germany, Italy, Spain

	FGIS	UK	Difference	
Labour flexibility	2.13	3.94	-1.81	*Relative advantage for the UK*
Barriers to exit	1.92	3.29	-1.37	
Taxes & Tariffs	3.23	3.27	-0.04	
Labour productivity	3.19	3.06	0.13	*Relative disadvantage for the UK*
Interaction with government	3.44	3.18	0.26	
Labour cost	2.38	1.94	0.44	
Logistics & infrastructure	3.47	2.88	0.59	
Governmental subsidies	3.92	3.31	0.61	
Environmental regulation	3.14	2.44	0.70	
Quality of R&D resources	4.43	3.71	0.72	
Quality of local suppliers	4.00	3.00	1.00	
Availability of skilled labour	3.50	2.41	1.09	
Skill level of workforce	3.88	2.76	1.12	
Availability of local suppliers	4.00	2.53	1.47	

Decline in R&D means UK is poorly placed for shift towards low-carbon powertrains



UK auto sector is competitive, but fragile

- Loss of scale drives *"hollowing out"* of the component supply chain
- 10,000 UK jobs lost every year
- Some issues have remained over decades:
  - Government ambivalence
  - UK supplier base
  - Availability of skilled workforce
- Trends in R&D and capital investment are a particular concern
- UK is competing as an *assembly* location

Full report: www-innovation.jbs.cam.ac.uk/publications/reports.html
Email: m.holweg@jbs.cam.ac.uk

A positive and supportive business environment

Richard Parry-Jones

Creating a Winning Framework – Present State

- Present industry situation fragile:
  - Weak business case for new/inward investment.
  - No structural cost advantage compared to European or BRIC manufacturing locations – hollowing out of supply base.
  - Labour flexibility positive but works against UK in recession (e.g. short-time working subsidies transfer jobs to Europe).
  - Lack of domestic critical mass/demand growth.
  - Key decision-makers are not UK-based.
- But there are positives:
  - Major improvements in productivity/quality over 20 years
  - Still significant contributor to national prosperity/R&D
  - Low carbon technologies provide catalyst for change
  - Temporary window for exporters from weaker sterling

Creating a Winning Framework - Challenges

- Sector profile/legacy image problem – presently weak taxpayer case for car industry support as part of industrial activism – e.g. technology investment.
- Influencing (overseas) decision-makers – much stronger UK investment offer needed to attract Tier 1's.
- Short-term issues (demand, credit availability) undermining ability of UK industry to invest in future
- Massive subsidies by European and US to their domestic manufacturers – increasing UK competitive disadvantage

- Industry now at tipping point.

Creating a Winning Framework - Recommendations

- Strengthen certainty and credibility:
  - Establish an Automotive Council – provide policy governance and execution tracking
  - Automotive Council to establish a long-term Automotive Framework to 2025
  - BERR Automotive unit to coordinate government response

- Improve UK investment offer:
  - Simplify and maximize incentive offers tied to framework.
  - Co-funding of carbon reduction projects
  - Focus public procurement to encourage UK industrial development

Creating a Winning Framework - Recommendations

- Widen collaboration
  - Cross sector (e.g. auto/aerospace/energy/renewables) and business-university science and research
- Promote positive automotive industry image
  - Through SMMT/Industry insight -- starting from school through higher education and wider public.
- Get monetary and fiscal message right
  - Learn from crisis to create more robust credit systems
  - Align national and local tax systems to policy

Creating a Winning Framework - Recommendations

- Protect flexible labour markets
  - Including provision of short-term wage subsidy systems as exist in European competitors

- Expand and deepen skills provision
  - Sector skills (SEMTA) workplace offerings linking right through STEM-based higher education.

Conclusion:

- Creation of Automotive Council and development of a long-term Automotive Framework provides vehicle to implement NAIGT recommendations and improve certainty and credibility of UK investment offer.

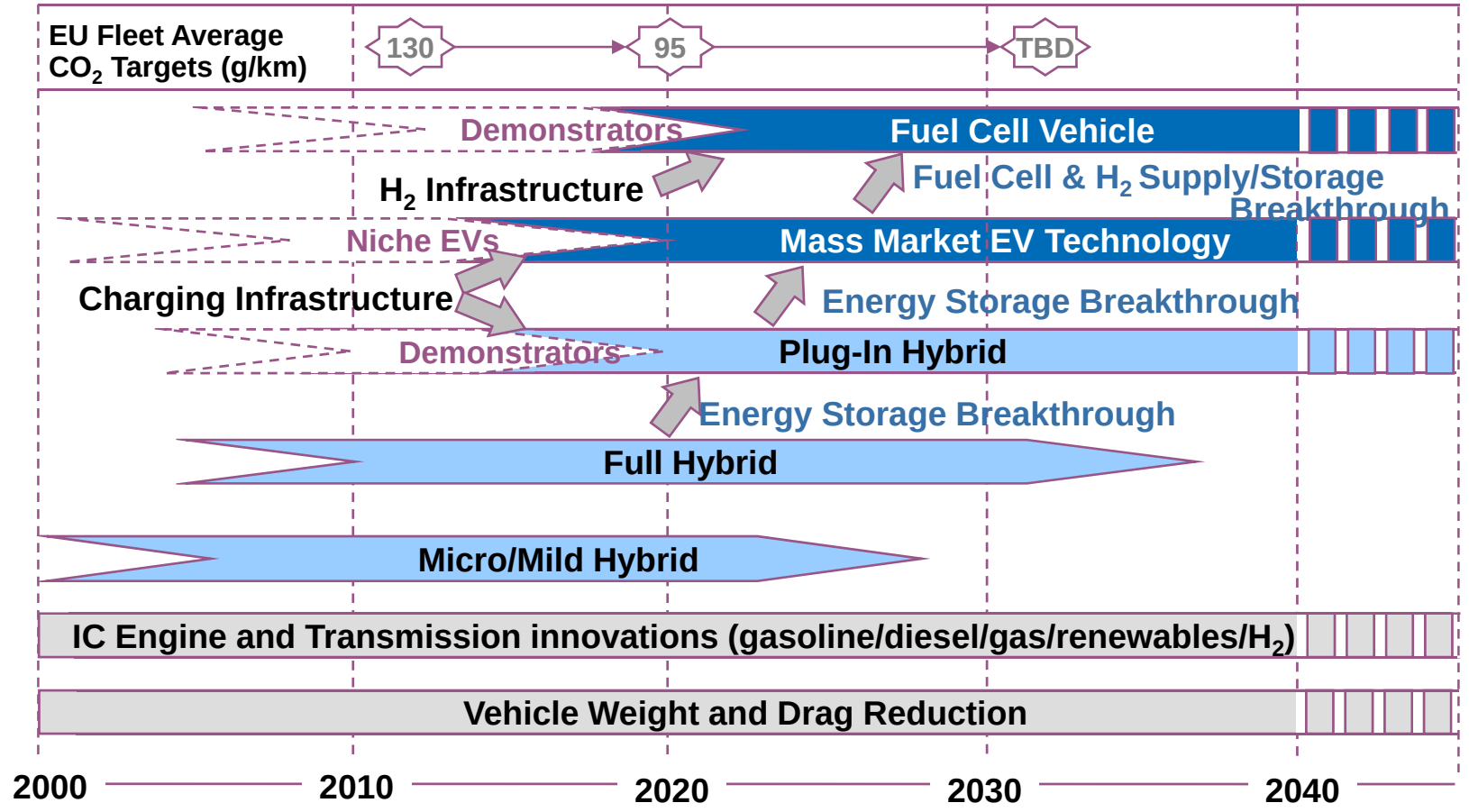
Technology and low carbon

Jerry Hardcastle

Nissan

New Automotive Innovation & Growth Team (NAIGT)

Technology Road Map



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

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

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	• IC engine optimisation • Boost systems for downsizing • Flexible valve/actuation for engines/transmissions • Low cost compact e-motors	• 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)	• 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	• Improved quality / durability 200+ Wh/kg & $800/kW.h cost battery systems • Low cost power electronics	• Next gen batteries 300+ Wh/kg and $500/kW.h cost • Flexible power elec. modules • Other forms of energy recovery (mechanical/chemical etc)	• 3rd gen batteries 400+ Wh/kg & $200/kW.h cost • New low cost solid state power conversion systems • Hydrogen storage technology
Vehicle Efficiency	• Lightweight structures and interiors • Low rolling resistance tyres / brakes	• New vehicle classes and configurations • Combination of function to reduce weight / cost • Minimised weight / losses	• Flexible re-configurable multi-utility vehicle concepts • 50% weight reduction from 2008 • Advanced aerodynamic concepts
System Control	• Information enabled control (Topology, V2V, V2I, traffic etc.) • Optimised vehicle energy mgmt. • Intelligent thermal management	• Advanced information enabled control • Intelligent P/T and HVAC mgmt.	• Autonomous P/T and vehicle control integrated with active safety
Energy + Fuel Supply	• Optimised 1st gen biofuels processes • New 2nd gen biofuel processes	• Intelligent energy / re-fuelling infrastructure (e.g. fast charge) • Industrial scale demonstration of new 2nd gen biofuel processes	• 3rd gen biofuel processes • 2nd gen industrial scale biofuel production infrastructure
Processes + Tools	• Process + delivery tool development and connectivity	• Auto-optimisation methods using virtual systems	• Artificial Intelligence to deliver complex multi-criteria system optimisation

New Automotive Innovation & Growth Team (NAIGT)

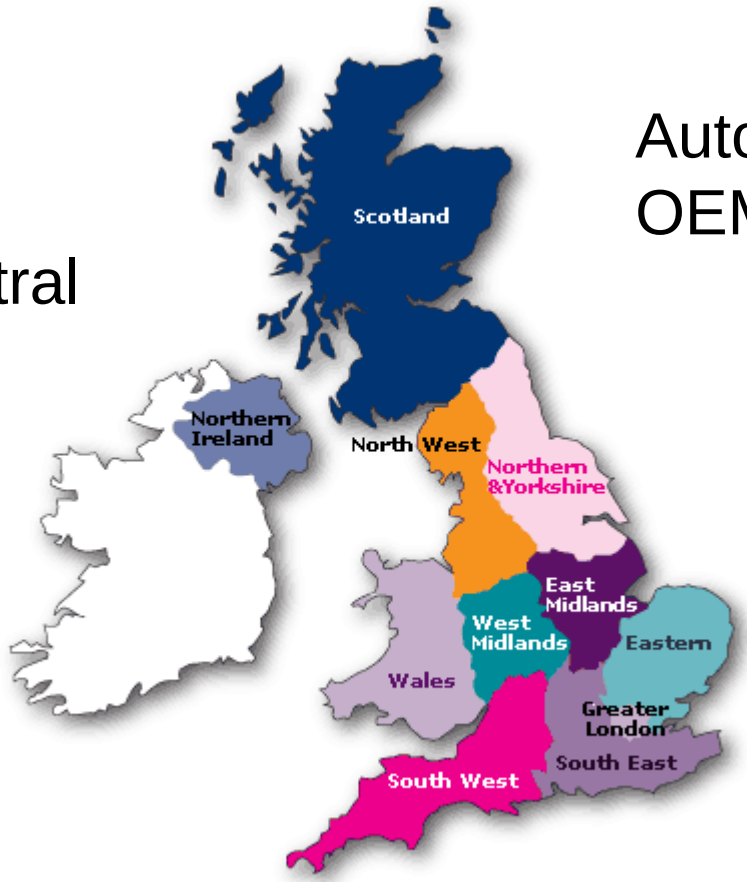
Test Bed UK

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.

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

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

A stronger and more competitive supply chain

Jon King
Corus

What does success look like?

- Contributing more positively to UK balance of payments (currently c £12bn adverse each year)
- Giving OEMs and Tier 1s good reasons for
  - Staying in / growing in / coming to the UK
- Having the most attractive automotive manufacturing sector in Europe
  - Research, development and production
  - High value adding SME Tier 2/3 foundation

Supply Chain Expert Group programme

- Four main review themes
  - Ensuring the competitiveness of UK supply chains
    - Lessons of national SCG programme and new pilots with Japanese OEMs
  - Developing manufacturing competencies and capabilities
    - “Hollowing out” UK supply chains: loss of the high value added production and development at Tier 2/3 level
  - Research and Innovation Support
    - Academic-industry collaboration: current systems complex, not focused on benefit to UK plc
  - Attracting R&D, etc from OEMs and Tier1s
    - Significant and differentiating action is required if OEMs/key suppliers are to see UK as a ‘second home’

Recommendations (1)

- Establish a UK Automotive Supply Chain Council, with the following responsibilities
  - Establish a continuous national supply chain groups programme to streamline access to business support
  - Establish a Sourcing Roadmap to identify value adding opportunities to reverse the current ‘hollowing out’ trend
  - Address the internationalisation potential for UK Tier 2/3s
  - Look for opportunities for the niche vehicle and supply industry as development sources for emerging technologies
  - Review the investment environment requirements to realise these opportunities
  - Promote the UK supply chain internationally

Recommendations (2)

- Establish a UK Institute for Manufacturing Technology to provide a focal point for revitalising automotive supply chain manufacturing, with a two-step approach:
  - Pull together a core of existing high quality institutions and facilities, with revised and coordinated funding streams, to make a statement of intent for UK manufacturing revival
  - Use this as a blueprint for industry/university collaborative research and progressively implement across the UK

Recommendations (3)

- Leverage and market the pilot Test Bed UK to global Tier1 suppliers as a reason for investing in the UK
  - Foster links with innovative/niche technology companies to generate upscaling partnership opportunities
  - Institute for Manufacturing Technology would provide academic and R&D facilities as a ‘one stop shop’

- These recommendations
  - Take us from inefficient and tactical interventions to strategic, continuous and well-managed larger programmes
  - Need to be developed and driven by industry through the Automotive Council partnership with government

Q&A Session