



UNITED KINGDOM HYDROGEN ASSOCIATION

Alternative fuels and the hydrogen possibilities

Alastair Rennie

Chair, UKHA

Project Director, Renewables, AMEC



Presentation overview



- Who we are
- Alternatives to oil
- Options for H2 for transport

"Towards a Sustainable Automotive Industry: Meeting the Fuel and Engine Technology Challenge"

Automotive World conference on Tuesday 29th January 2008

The Institution of Mechanical Engineers, One Birdcage Walk, London

Who is AMEC?

- FTSE 100 company
- Core businesses:
 - Power
 - Energy Delivery
- 2006 aggregate revenues of £3.2bn and pre-tax profit of £64.7m.
- 16,000 employees worldwide
- AMEC's vision is to be a leading supplier of high value consultancy, engineering and project management services to defined market segments within the world's energy and industrial process industries
- Renewables and clean energy interests include wind, marine energy, biomass, biofuels, CHP and carbon capture & storage

Who is the UKHA?



- Formed in May 2006
- Diverse Membership
- Industry association whose mission is to foster the development and use of hydrogen technologies and to promote the use of hydrogen as an energy carrier in the United Kingdom
- Key activities
 - Policy
 - Regulations and Standards
 - Education
 - Collaboration
 - Desire to lead effort to develop UK hydrogen roadmap/commercialisation plan

Air Products & Chemicals

AMEC

BOC / Linde

Bryte Energy

Cenex

**The Centre for Process
Innovation**

E.ON UK

Glamorgan University

H2 Logic

ITM Power

Johnson-Matthey

Logan Energy

MMI

Newcastle University

Renew Tees Valley

S&TFC RAL

Voller Energy

Wind Hydrogen

Alternatives to oil



- Gas to liquids
 - Coal to liquids
 - Biomass
 - Energy crops- food issues and GHG benefits
 - Cellulose breakdown and non food crops, including algae
 - Pyrolysis and gasification
 - Electricity
 - Battery cost, clean use but GHG source issues
 - Range extension by fossil fuels, solar and hydrogen
 - Hydrogen
 - Distribution & storage issues, clean use but GHG source issues
 - Prime driver or range extender, ICE or fuel cell equipment
-

UKHA Commitment



- Defining hydrogen's role in a low carbon economy
- Providing a focal point of authoritative advice to government
- Advocating hydrogen and answering concerns
- Formulate consensus from the shared interests of stakeholders
- Guidance on R&D priorities
- Sharing information and promoting knowledge transfer
- Best practise
- Influencing EU policies
- Represent and promote UK hydrogen industry internationally

Current foci are on H2 Standards and H2 fact sheets as well as UK Government policy

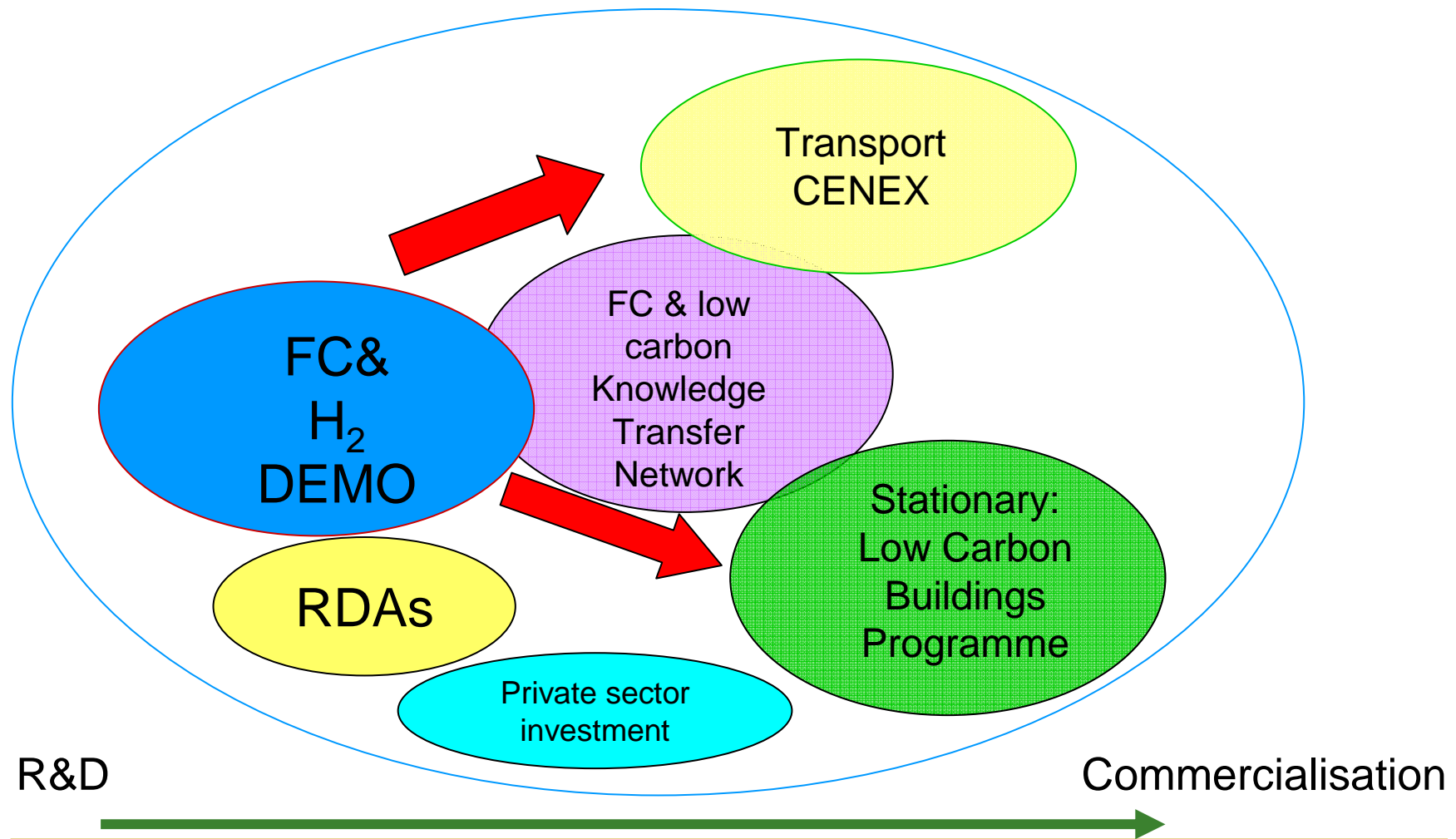
UK Drivers to Hydrogen



- Climate Change
- Energy Diversity
- Energy Efficiency
- Security of Supply
- Sustainability



Recent UK developments



UK Hydrogen Sites



Key Areas

Teesside

Existing hydrogen infrastructure and storage

Midlands

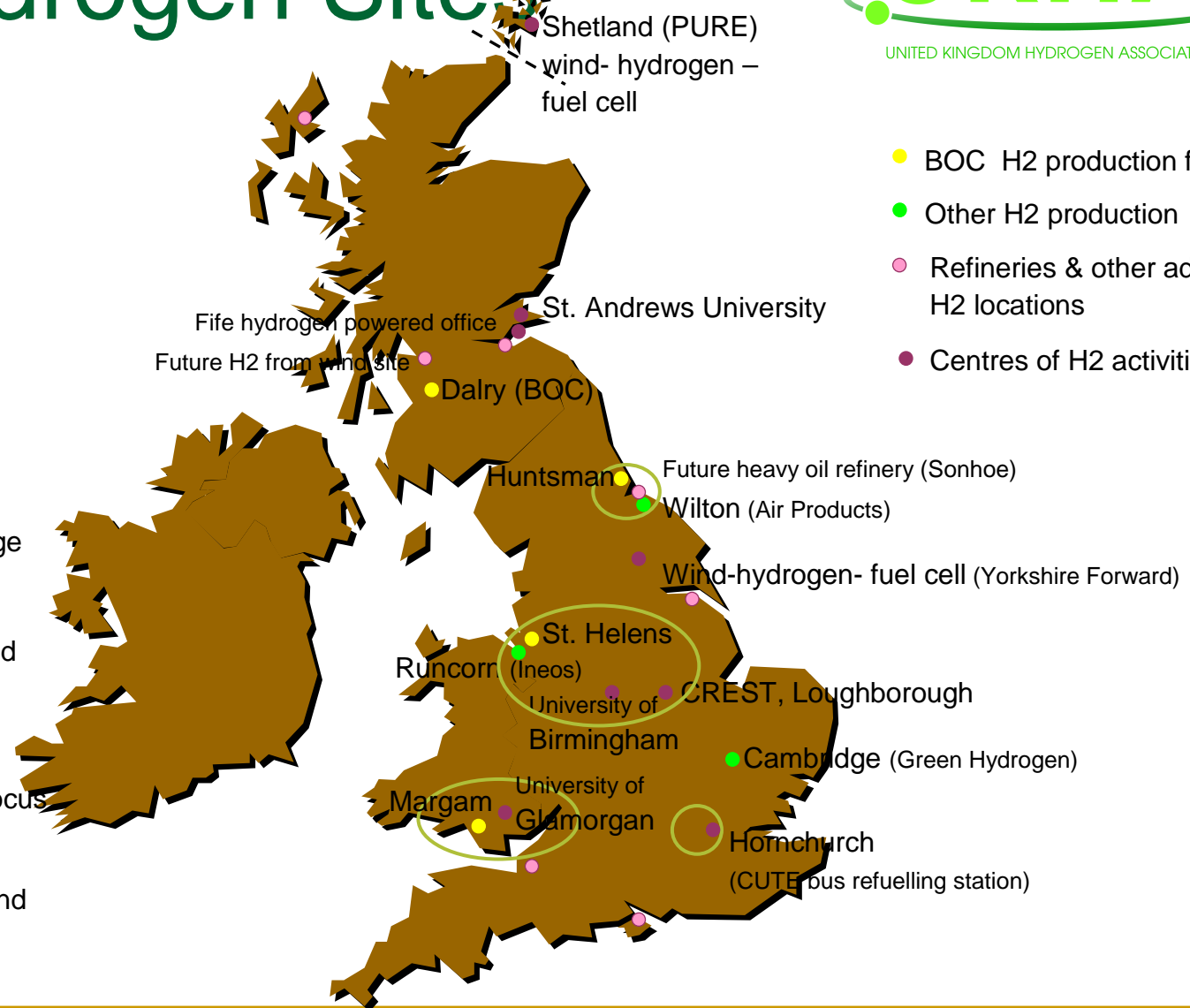
Hydrogen production and academic research

London

Political will, transport focus

South Wales

Existing infrastructure and Academic excellence



- BOC H2 production facility
- Other H2 production
- Refineries & other additional H2 locations
- Centres of H2 activities

Opportunities – micro generation

- Cross over thinking between distributed generation and local H2 generation, for example by Honda and Plug Power

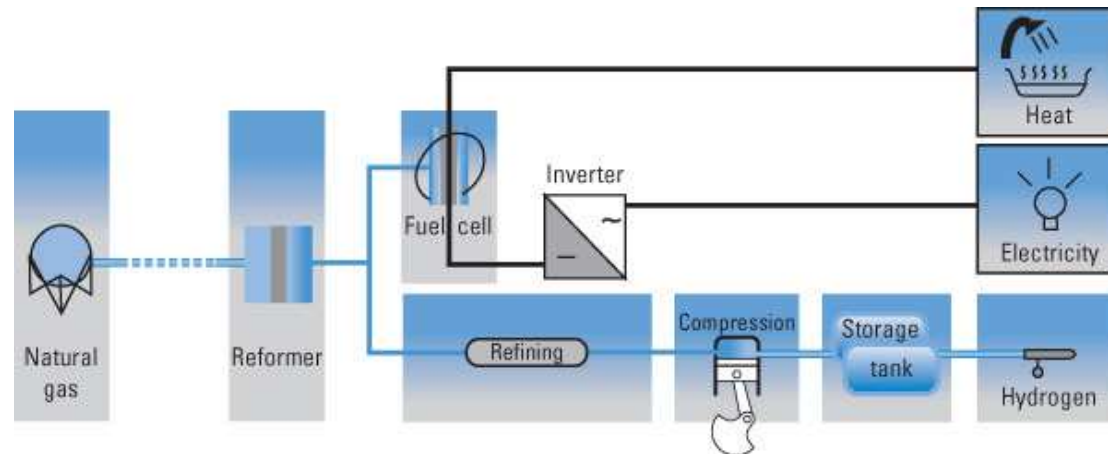


Image from Honda/ Plug Power on <http://world.honda.com/FuelCell/FCX/station/>

- The car integrated into the home electricity supply
 - An H2 powered car can refill from a public filling point, or at home, say at night supply rates.
 - The car can act as the store for H2 and either use the H2 for transport or power the home with H2 or peak electricity as in other proposals for distributed stationary power.

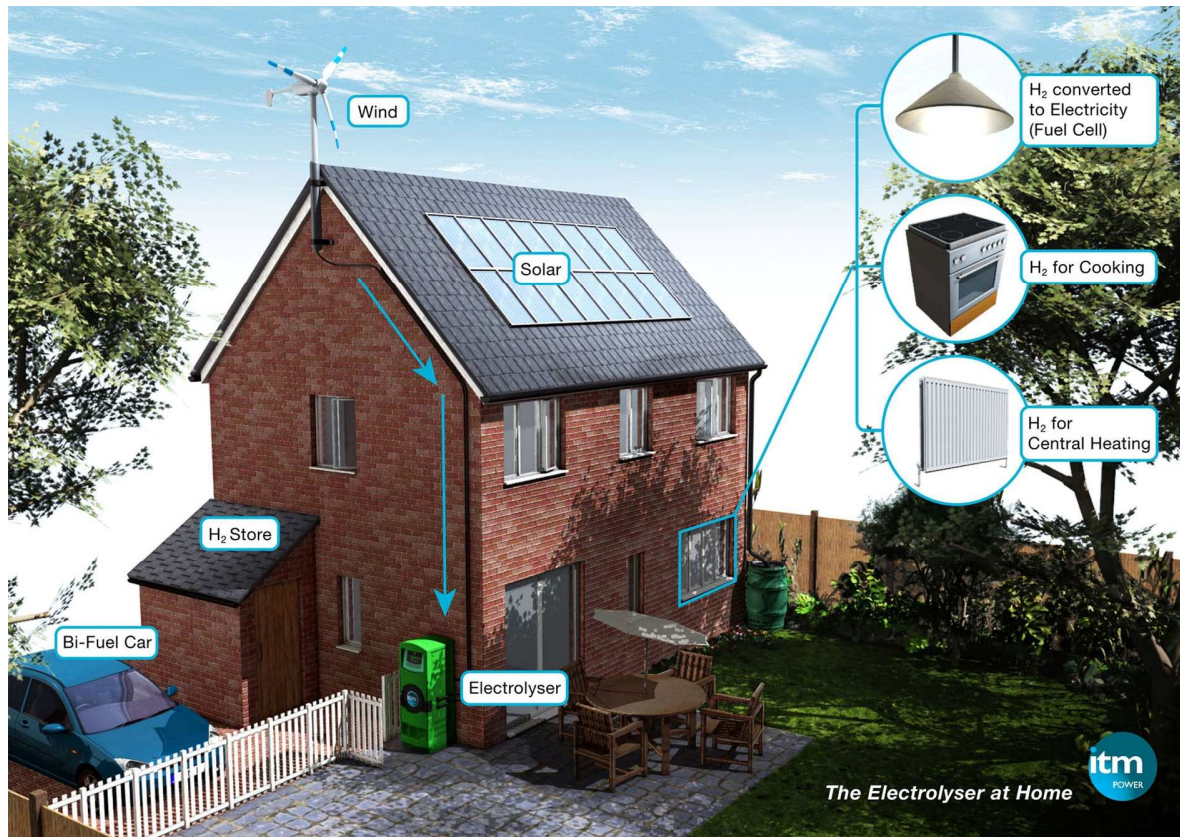


Opportunities – micro generation



- UK firm ITM Power is developing a low cost 10kW electrolyser for refuelling hydrogen cars, at home, with renewable hydrogen. The electrolyser can also make carbon free hydrogen for application in zero carbon housing developments.

ITM's electrolyser is due to start field trials and production during 2008 .



Opportunities



- Consumer preferences are evolving
 - Use multiple delivery routes to get the right cost
 - Policy makers probably over-estimate the cost of action
 - We don't need a “hydrogen economy” in order for hydrogen and fuel cells to make a significant contribution to sustainable energy
-

The role of Hydrogen

- This is the century that we must tackle Climate Change and still meet the energy needs of the UK economy
- Low carbon and sustainable energy solutions are required
- The UKHA believes that hydrogen can play an essential role in achieving sustainable supply options and a low carbon future



Thank you for your attention

Alastair.Rennie@amec.com

07889 486 827

www.amec.com

Consultancy and feasibility

Environmental

Operational and maintenance services



Design and engineering

Project management and delivery

Programme Management

You can join



The United Kingdom Hydrogen Association

GIBC, Unit 7
Mulgrave Terrace
Gateshead
Tyne & Wear
NE8 1AN

Tel. +44(0)191 490 9442

Fax. +44(0)191 490 9441

Email info@ukha.org

web site: www.ukha.org
