Update on UK Hydrogen and Fuel Cell Activities

Making Way for Scotland's Hydrogen Economy
Edinburgh Council Chambers, 30th September 2010

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Scope of Presentation

- Merger of UKHA and FCUK
- UK-HyNet
- Political context
- Industry highlights
- Events
- Summary

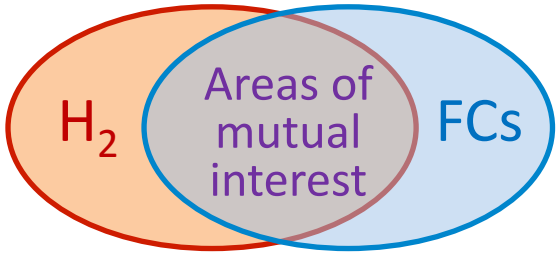
Formation of UK HFCA

- UK Hydrogen and Fuel Cell Association formed 1st July 2010
  - Merger of UK Hydrogen Association and Fuel Cells UK

UKHA
UNITED KINGDOM HYDROGEN ASSOCIATION

fuel cells UK

  - Catalysed by the emergence of UK-HyNet
  - Hydrogen and fuel cell landscape had become overly complex and fragmented in the UK
  - Single voice needed
  - Critical mass needed
  - Economies of scale achievable
  - Followed the example of
    - ~ SHFCA
    - ~ Merger of National Hydrogen Association (NHA) and the US Fuel Cell Council (USFCC)
      - ¤ Common voice needed to reverse Dr Chew's decision on funding
  - Please become a member!
    - ~ Its effectiveness depends upon you
    - ~ Contact Celia Greaves: c.greaves@synnogy.co.uk, 01223 96 9790



UK-HyNet Progress – Part 1

- Progress temporarily slowed by external factors
  - Merger of FCUK and UKHA
    - ~ How will UK-HyNet integrate with new UK HFCA?
  - Politics
    - ~ Effect of RDA closure on regional activities
    - ~ Concentration on dialogue with Govt
- Despite this, new refuelling facilities are being added to the network
  - Currently 10 operational
- UK-HyNet to be part of NAIGT's (New Automotive Innovation and Growth Team) Testbed UK

UK-HyNet Progress - Part 2

- London Hydrogen Partnership
  - London Hydrogen Action Plan aims to access funding from EU, UK Govt and private sector
    - ~ Bid being prepared for JTI (FCH JU) call in Oct 2010
  - Bus refuelling station under construction
    - ~ 5 buses on RV1 route, operational by 2011 (10 buses by 2012)
  - 5 more refuelling facilities planned for 2012
    - ~ 150 hydrogen powered vehicles, incl. cars, vans, taxis, bikes, forklifts, etc
      - ¤ 50 for Functional Bodies (fire, police, etc)
  - UK's largest in-house H2 FC at TfL's building, opened by Kit Malthouse, London's Deputy Mayor for Policing, Feb 2010

- Bristol Accord, June 2010
  - Agreement between Low Carbon Economic Areas
    - ~ North East (ultra low carbon vehicles)
    - ~ Midlands (low carbon automotive engineering)
    - ~ Wales (alternative fuels)
    - ~ South West (extension of Welsh LCEA)
  - Collaboration on development of low carbon vehicle infrastructure
  - UK-HyNet will build on work already undertaken by these regions
    - ~ including the establishment of 10 hydrogen refuelling stations for RD&D purposes
- British Midlands Hydrogen Forum
  - Midlands Hydrogen Ring plans under development....

Political Context

- Under previous government
  - UKHA present new case for hydrogen to DECC, Nov 2009
  - TSB call, Feb 2010
    - ~ £7m for H2&FCs

- New government
  - No change in policy on H2&FCs indicated yet
  - UK HFCA meeting Prof David Mackay (Chief Scientific Adviser to DECC) , Aug 2010
  - Presentation by Prof Julia King (Climate Change Committee) at HoC indicates improving prospects for H2&FCs, July 2010
  - Closing down of RDAs
    - ~ Regional H2&FC activities have been strongly supported by RDAs

Industry Highlights – Part 1

- Intelligent Energy
  - £0.8M business investment grant from EMDA
    - ~ Move to new premises
  - Reveals Suzuki Burgman fuel cell scooter, Feb 2010
    - ~ Range = 217 miles
  - Unveils (with Lotus, LTI and TRW Conekt) zero-emissions FC-Hybrid London taxi
    - ~ Top speed = 80+ mph
    - ~ Range = 250+ miles

Industry Highlights – Part 2

- ITM Power
  - Launched 5 small and medium size electrolyser products
    - ~ Hlab, Hbox, Hflame, Hpac, HFuel
  - Initiated HOST on site hydrogen trials
    - ~ Begins in 2011
    - ~ 1 week free trial of HFuel and two Revolve HICE transit vehicles
      - ¤ Option to lease both HFuel and vehicles for additional week(s)
    - ~ Hydrogen produced on site at point of use
    - ~ Sites operated by Scottish Water, DHL, Stansted Airport, Forestry Commission, Sheffield City Council, London Borough of Camden

Hbox 0.18Nm³/h electrolyser

HFuel mobile vehicle refueller

Industry Highlights – Part 3

- Riversimple
  - 30 vehicles to be located in Leicester from 2012
    - ~ Prototype city car does equivalent of 300 miles per gallon and has max speed of 50 mph (80km/h).
    - ~ Leased at £200 p.c.m. plus 15p/mile
- Microcab
  - Begin using Serenergy high-temperature PEM fuel cells
  - Cabled project
    - ~ 110 low-emission vehicles
    - ~ 6 car makers
      - ¤ Microcab supplying 10 FCVs
      - ¤ Others providing EVs and hybrids
    - ~ Plus Arup, E.On and universities of Birmingham, Coventry and Aston
    - ~ Trials in Coventry and Birmingham
    - ~ Part-funded by the TSB with support from AWM

Riversimple at Leicester

Microcab in Birmingham and Coventry

Industry Highlights – Part 4

- Air Products
  - Announce planned 49MW renewable energy plant in Tees Valley
    - ~ Advanced gasification technology
    - ~ Waste to energy
      - ¤ Diverts waste from landfill
      - ¤ Convert pre-processed waste to base load power for to 50,000 homes
      - ¤ Fuels, including hydrogen, and other related products
  - Ian Williamson appointed President of EHA

Industry Highlights – Part 5

- Acal Energy
  - Leads TSB funded field demonstration of liquid cathode fuel cell system
- AFC Energy
  - AFC technology in proposal for 500MW CCS on Teesside
  - First commercial revenue from Linc Energy
    - ~ Successful test of Alpha system operating on hydrogen from underground coal gasification
  - Agreement with Centrica plc for reservation of future capacity
- Air Fuel Synthesis
  - Fuels synthesised from reacting hydrogen with carbon captured from air
  - Raised £0.5M to build pilot plant
- Ceres Power
  - FC boiler will be on the mass market from mid 2012
    - ~ Working with British Gas, Calor Gas and Daalderop to develop CHP unit running on methane
- Smith Electric Vehicles
  - Signed MOU to partner with Proton Power Systems
- Bristol call for tenders to trial FC ferryboat

Events

- Hydrogen & Fuel Cells for Clean Cities
  - NEC, Birmingham, March 2010
    - ~ Prof Rex Harris receives 2010 H_2 & FC Future Award
- EG&S KTN
  - Challenge of Intermittency – will hydrogen deliver?, Cheltenham, June 2010
  - Emerging Support Strategies for Fuel Cells and Hydrogen, Wales, Sept 2010
- Supergen research consortia meetings
  - UK SHEC: Bath
  - HDel: Cardiff and Cambridge
- Bridgestone Brighton to London Eco Rally 2010, July 2010
  - ITM Power's H2-ICE Ford Focus driven by Quentin Wilson
  - No FCVs this year!
- LCV 2010, Millbrook, Sept 2010
  - FCVs: Honda FCX Clarity, IE-Lotus-LTI FC taxi, etc
  - H2-ICEVs: Revolve vans, ITM Focus, etc

Summary

- UK is a quiet success story
- Refuelling infrastructure being deployed through UK-HyNet
  - Slowed by external events (e.g. FCUK – UKHA merger, politics, etc)
  - Small refuelling facilities are being deployed
    - ~ Linked to hydrogen vehicle trials
    - ~ Low risk, iterative rollout (may have advantages over German or Californian approach)
- UK has several world-leading FC technology developers
- UK has strong research in hydrogen production, storage and use
- Unique technology and infrastructure demonstrations
  - London buses (large-scale refuelling, advanced buses, significant numbers)
  - Teesside waste to energy and fuels plant
- Leadership in BEV deployment could be advantageous for early positioning of the in FCV markets
- HFC technologies appear to be coming in from the cold

Any Questions?

..., or have I missed anything?

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Thank You