

# Your Chance to Shape the UK Hydrogen Roadmap

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## Presentation overview

- The need for a roadmap
- Activities to date
- Defining the Endpoint
- An Invitation

## The Need for a Roadmap

- Analysis shows a large functional gap in low-carbon energy systems that can only be filled by hydrogen
  - Inevitability of a large domestic market
  - Potential to exploit UK's world-leading expertise for huge export market
- Over 100 UK companies are contributing to the creation of the global hydrogen and fuel cell industry
  - 2<sup>nd</sup> largest group in Europe behind Germany but quite different mix of players and a different context
  - Significant interest from regions
- No UK-wide low carbon hydrogen strategy – yet
  - Need to prepare for emergence of a low-carbon economy

## Activities to Date

- International Roadmaps
  - Many countries have a national hydrogen roadmap, including Canada, Australia, USA, India (these are published in English).
  - In the USA, many states have published roadmaps, including New York and Texas; and the USA has developed hydrogen roadmaps based on different sectors, including manufacturing and transport.
- UK DfT Carbon to Hydrogen roadmaps for passenger cars
  - Update available at <http://www.dft.gov.uk/pgr/roads/environment/research/cqvcf/ontohydrogenroadmapsforp3821.pdf>
- Regional plans and strategies
  - Wales has a published hydrogen vision, Scotland and the Midlands are working towards one, other regions have specific projects with strategies
- EU HyWAYS Project
  - UK was a participant
  - Activity highlighted areas where the UK has no or limited data

## Activities to Date - continued

- UKHA has met with DECC and TSB
  - Described the need to define the endpoint for hydrogen in the UK, and agree a path for developing a roadmap (taking account of work already done)
  - To describe key milestones and roles for industry, academia, government, regulators, and other stakeholders
- Roadmapping Workshop for Regional H<sub>2</sub>/FC clusters – November 2008
- Roadmapping Workshop for UKHA members – March 2009

## Workshop methodology

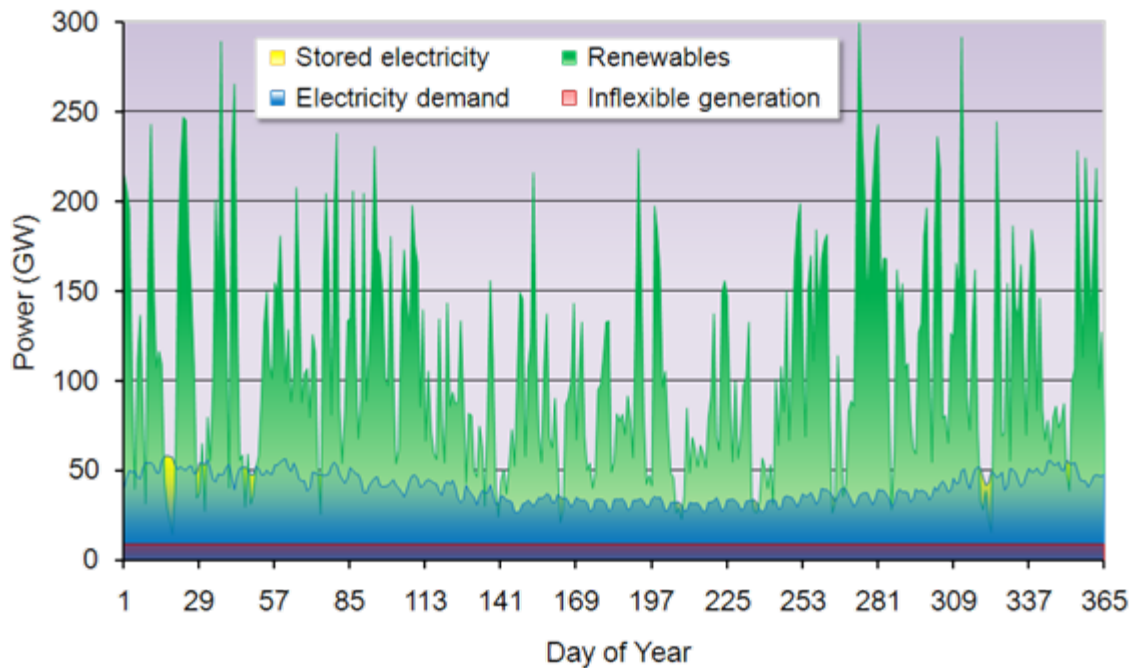
- “Future-basing” - a technique for ambition-building
  - Basing yourself at a chosen time in the future and generating a context or series of categories for your success
    - Examples, Energy Diversity & Security, Green Buildings, Transport, Green Economy, Green Education, Global Impact
  - Describing a full, sensory vision of success in each of those categories
  - “Remembering” back and noting key steps taken to achieve this success
  - Returning to the real-time present, and doing a reality check on the plan.
- Provided a starting point upon which to build

## Roadmapping process

- Roadmap requires short-, medium- and long-term planning.
  1. Analyse scenarios that meet government targets for 2010, 2020 and 2050
  2. Analyse additional interim steps (e.g. 2015, 2030)
  3. Describe the desired endpoint for hydrogen in the UK
  4. These snapshots can be used to trace market development curves
  5. Consultation with stakeholders
  6. Phased actions required to meet these growing market demands will be proposed
  7. Immediate actions required to exploit earlier export market opportunities will be proposed
- An energy system assessment tool is available for analysing future energy scenarios (subject to funding availability).

## Example scenario

- **Low-carbon energy system:** energy supply and demand (aggregated across the UK) in a wind-dominated, post-fossil-fuel energy system



Source: Bryte Energy

- Green areas (renewable supply in excess of grid demand) = energy absorbed by 'smart' battery charging and hydrogen production for transport applications
- Yellow areas = power required from storage (possibly hydrogen)

[NB: Bio-energy is most valued for dispatchable (stationary) power generation and aviation fuel in this scenario]

## An Invitation

- The UKHA desires input from all interested stakeholders
- Please stop by the UKHA stand, contribute your thoughts and aspirations, and register your interest
- During the roadmap development process, stakeholders will be invited to contribute through workshops and other means

## 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**  
**Gastec at CRE**  
**ITM Power**  
**Johnson-Matthey**  
**Logan Energy**  
**MMI**  
**Newcastle University**  
**S&TFC RAL**  
**SgurrEnergy**  
**TNEI Services**  
**University of Ulster**  
**Wind Hydrogen**  
**Plus individual memberships**

**Thank you for your attention**

[www.ukha.org](http://www.ukha.org)

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