

REVIEW OF UK HYDROGEN CAPABILITIES

Introduction

The UK is a participant in the International Energy Agency's Hydrogen Implementing Agreement Task 18 which studies the development of hydrogen demonstration schemes.

Through participation in the Task and the reports from other countries has become clear that there has not been a:

- comprehensive **study of the areas** within the field of hydrogen and fuel cells where the **UK is particularly active** or
- study of the **barriers** or **gaps preventing the development of hydrogen within a low carbon energy system** in the UK.

Potential Uses

At the same time as offering a controllable load for grid balancing, the production of hydrogen also provides a **flexible fuel** for the following end-use applications:

- transport;
- electricity;
- heat;
- all three above energy uses for remote communities.

Thus hydrogen is an energy vector that can **integrate all energy sectors** within a complete low-carbon energy system.

Full report available at <http://iea-hia-annex18.sharepointsite.net/Public/Annex%2018%20papers%20reports%20and%20presentations/Review%20of%20UK%20H2%20Capabilities.pdf>

Conclusions

- A **big break through** required is the **ability to produce hydrogen economically** for use as an alternative to fossil fuels in the UK.
- Presently, there is **very little infrastructure to distribute hydrogen** in much of the UK, especially for transport applications.
 - ⇒ With no consistent ability to 'fill up' with hydrogen, consumers are unlikely to consider hydrogen as an alternative to mainstream transport fuels.

Recommendations for the UK

- The UK needs to have a clear vision for **why hydrogen is important and how it wants to make use of it**.
- The UK should consider developing an **overall strategy** based on those of Germany and US and using information from EU projects.

- ⇒ This will require **collaboration from industry** to set specific, timebound targets and input from regional governments and agencies.
- ⇒ This process has already been started with initiatives by the main regional players to develop a **UK wide project**.
- This UK government should consider **supporting this project financially** in return for a **strategy with targets and timescales** being developed onto which the UK project maps.
- The TSB and ETI could both play important roles in bringing together the relevant stakeholders. The UK Environmental Transfer Fund (ETF) must also play a key role.

International Competition

US, Germany and Japan, and other countries are **more advanced** in many aspects of hydrogen and fuel cell development. The spend over the last 5 years on hydrogen and fuel cells per GDP in Japan, Germany and USA is hundreds of times greater than in the UK.

As a result,

- Germany already has over 300 vehicles on the road and;
- the USA in excess of 200;
- Japan has 2 187 microCHP fuel cells installed in homes.

Areas of Focus

It would probably be unwise at this stage for the UK to attempt to compete in all areas of the field. The UK should **focus on the areas where it has expertise**.

Areas of focus fall into 2 types:

- **Research & Development**
 - ⇒ Catalysts
 - ⇒ Storage
 - ⇒ Small-scale Electrolysers for renewables

These areas are **key** to **reducing the price** of hydrogen systems and making them **more practical**. They should feed into and support areas for demonstration.

- **Demonstration**
 - ⇒ Transport
 - ⇒ Biohydrogen Systems
 - ⇒ Application for Remote Communities

The areas indicate that there is **great potential for the UK** to **expand** on its existing **world-leading expertise** in system design and integration.