

SURVEY OF SUPPORT MECHANISMS FOR THE DEVELOPMENT AND DEMONSTRATION OF HYDROGEN SYSTEMS

Introduction

This project is part of the International Energy Agency (IEA), Hydrogen Implementing Agreement Annex 18. The Annex studies demonstration schemes and how they can be used as a basis to further **develop the role of hydrogen within low carbon energy systems**.

Key factors are:

- how **funding** is used;
- how projects are **managed** and **co-ordinated**.

The **purpose of the survey** is to identify methods that **successfully encourage the development of hydrogen systems** as alternatives to conventional power or fossil fuel technologies.

Successful methods can be characterised by:

- **Effectiveness**
 - ⇒ Achieving long term growth in hydrogen systems.
 - ⇒ An approach to funding could be very effective but not efficient because of its high cost.
- **Efficiency**
 - ⇒ the cost per kW of hydrogen system installed or per vehicle.

A support scheme could be very efficient if the amount of money spent on each hydrogen systems was relatively low, but not effective if the number of hydrogen schemes did not grow.

The second part of the survey is more qualitative. Its aim is to identify the **systems of management** and **co-ordination** of projects and portfolios of projects that allow lessons to be learnt and hydrogen systems to develop effectively.

Full report available at: <http://iea-hia-annex18.sharepoint.com/Public/Annex%2018%20papers%20reports%20and%20presentations/support%20mechanisms.pdf>

Results

There are some key themes that recur in countries that either have an effective (and in most cases efficient) process in place. These themes are:

- **Cross ministry co-ordination** within government.
- **Strong management processes** with **industrial involvement**.
- **International co-operation**.

Case Study - Canada

In Canada there are various programs set up at the federal level. An example of a **very successful** model is the Canadian Transportation Fuel Cell Alliance. This alliance are managed by National Research Canada (NRCan) and consisted of a pot of funding as well as 5 working groups. The working groups consisted of

- Studies and Assessments
- Heavy Duty vehicle demonstrations,
- Light Duty vehicles demonstrations,
- Communications,
- Codes and Standards.

The projects are managed by government but with input from the Project Advisory Committee that has representatives from regional and national government as well as experts in the field.

For hydrogen research and development in Canada most programmes have industrial advisory boards to ensure that the programmes remain relevant and these help guide public research.

Conclusions

- The countries that are **most successful** are **not necessarily the most populated or wealthiest**.
- Industrial and government co-operation are required to deliver a **well managed program of development**.
 - ⇒ There should be a clear timetable with economic and technical targets and a rigorous method of evaluation of project.
 - ⇒ Co-ordinating bodies should aim to publicise as much non-commercially sensitive information as possible.
- A **range of funding mechanisms** is useful to meet the range of applications for hydrogen and provide a smooth path from research to commercialisation.
- **International co-operation**:
 - ⇒ provides **momentum**;
 - ⇒ has the potential to **enlarge markets**;
 - ⇒ has the potential to **increase the speed of taking products to market**.
- Many of the attributes of a successful development programme for hydrogen technologies also apply to other technologies.
 - ⇒ However, the flexibility and range of hydrogen technologies results in a very large list of applications.
 - ⇒ This requires **input** and **co-ordination** from a **cross-section of areas of government** from the environment through tourism and transport to science and technology.