



International Partnership for Hydrogen and Fuel Cells in the Economy

INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

CONTACTS

The International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE) was established in 2003. The IPHE is a forum for member Governments to share information and policy experiences with the goal of accelerating the integration of hydrogen and fuel cell technologies into the economy. Each of the following IPHE partner countries have committed to collaborate to advance the commercialization of hydrogen and fuel cell technologies in an effort to improve their energy supply, environment, and economy:

[Australia](#), [Brazil](#), [Canada](#), [China](#), [European Commission](#), [France](#), [Germany](#), [Iceland](#), [India](#), [Italy](#), [Japan](#), [Republic of Korea](#), [Republic of South Africa](#), [New Zealand](#), [Norway](#), [Russian Federation](#), [United Kingdom](#), [United States](#).

Since the IPHE was formed, the organization has succeeded in establishing an effective operational structure to facilitate international collaboration and networking both among researchers and at the highest levels of government. Through the IPHE, nearly all partner countries have initiated roadmaps or national strategies for hydrogen and fuel cell development. The IPHE has supported 30 international collaborative projects covering a broad spectrum of topics including demonstrations; fuel cells; hydrogen production; hydrogen storage; regulations, codes & standards; transmission and distribution; and the socioeconomics of hydrogen. Additionally, more than 500 technical experts across more than 25 countries have been brought together in workshops organized by the IPHE to identify key areas for R&D collaboration on issues ranging from hydrogen production to utilization.

PRIORITIES

The IPHE has established a set of strategic priorities and is structuring the organization's activities around the following areas:

- Accelerating the market penetration and early adoption of hydrogen and fuel cell technologies and their supporting infrastructure
- Policy and regulatory actions to support widespread deployment
- Raising the profile with policy-makers and the public
- Monitoring hydrogen, fuel cell and complementary technology developments

SECRETARIAT

In December 2009, the IPHE Chair and Secretariat roles were transferred from Canada to Germany. Contact the Secretariat at secretariat@iphe.net or the following street address:

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Global opportunities for the implementation of hydrogen and fuel cell technologies are presented in the IPHE Communiqué

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HYDROGEN AND FUEL CELLS – A REAL OPPORTUNITY

Hydrogen and fuel cell technologies offer a pathway for enabling clean energy systems, enhancing energy security and stimulating global economies. Hydrogen and fuel cells can use a broad base of available domestic energy resources, including all renewable and non-renewable sources, as well as waste-streams from chemical processes. No other energy technology solution has the ability to utilize such a wide variety of energy sources and substantially reduce greenhouse gas emissions. Furthermore, hydrogen and electricity are two complementary and viable energy carriers available today that can effectively decarbonise our energy systems.

The world has safely used hydrogen for decades as a commodity. It is used extensively in the production of refined oil products such as gasoline and diesel fuel, food products, chemicals, semiconductors, metals, and more. Moreover, hydrogen and fuel cell technologies are successfully being used today in a variety of specialty market applications including powering fork lift vehicles, back-up power systems for residential and industrial users, auxiliary power units, urban transit vehicles and personal electronic devices, all of which require only modest supporting infrastructures and are becoming commercially viable options.

Aligned with the expectations a decade ago, a sustained global research, development and demonstration (RD&D) effort is now producing the necessary technological breakthroughs. For example, the high volume cost of fuel cells is approaching the cost of incumbent technologies. Also, hydrogen fuel cell vehicles have already demonstrated more than twice the fuel efficiencies of standard vehicles.

HYDROGEN AND FUEL CELLS – A CLEAN OPPORTUNITY

Utilizing hydrogen fuel cell technologies for transportation offers a real chance to shift greenhouse gas mitigation efforts from vehicles to power generation sites since these vehicles only produce water vapor as a byproduct. It is now vital to build capacity for clean hydrogen production for both near and longer term applications. Hydrogen is used today for the production of synthetic liquid fuels and biofuels, it can be mixed with natural gas for cleaner combustion. As hydrogen capacity builds and competitive fuel cell systems continue to develop for portable, stationary power and transportation markets, they can gradually replace fossil fuelled systems. Hydrogen also offers an important way to store generated electricity, particularly from intermittent renewable sources such as solar and wind so that excess energy can be used later when demand is high.

HYDROGEN AND FUEL CELLS – A GLOBAL OPPORTUNITY

Hydrogen and fuel cell technologies are not yet fully competitive in the energy system. To increase their cost effectiveness, technology advancement is necessary. Around the world, Governments are strongly pursuing hydrogen and fuel cell technologies, collectively investing approximately \$1 Billion per year in RD&D activities. Centers of excellence designed to further develop hydrogen and fuel cell technologies in all IPHE countries are well established and making significant progress. Major automotive companies see commercialization starting in 2015, but government support for market introduction will be needed.

IPHE recommends the following actions by public and private sectors to further capitalize on the energy security and emissions-reductions benefits that the widespread adoption of hydrogen and fuel cell technologies offer:

- 1) Stimulating early markets through government procurement and early deployment and making available incentive programs for early adopters;
- 2) Continuing to improve product performance and cost-effectiveness through sustained investment in RD&D and infrastructure;
- 3) Expanding the use of variable renewable energy production through the integration of hydrogen and fuel cell technologies;
- 4) Motivating private and public sector financial investments in hydrogen and fuel cell technology developers and manufacturers; and
- 5) Improving education/public outreach, skills and training; codes, standards and regulations.

HYDROGEN AND FUEL CELLS AND THE IPHE

The IPHE is a forum for member Governments to share information and policy experiences with the goal of integrating hydrogen and fuel cell technologies into the economy. The members collectively account for over 85% of global GDP, over 75% of the global electricity, and more than 65% of global greenhouse gas emissions. The IPHE members take advantage of their global leadership position and national expertise to extensively collaborate to advance hydrogen and fuel cell technologies. Continuing to work collectively is the only way to ensure that hydrogen and fuel cells play their key role in benefitting our future energy portfolios.