



This document is drafted by the Ministerial Task Force¹ - China, EU, France, Germany, Japan, and U.S. The paper is distributed to IPHE for review and consideration and serves as preparation for discussing the roundtable meeting as proposed below.

Roundtable “IPHE – Hydrogen and Fuel Cells Stakeholders”

A special meeting of the IPHE Steering Committee

Berlin, November 17-18, 2011²

The Steering Committee of the IPHE will organise a “Stakeholders” roundtable, by invitation only, of about 80 participants in Berlin at the end of November 2011. The participants are expected to be actively involved in the deployment of Hydrogen and Fuel Cells (H₂ and FC) from industry, government, business sector, and R&D organisations. The roundtable will be focused on the stakeholder’s perspectives on H₂ and FC technology and the potential of H₂ and FC to contribute to meeting the global energy demand in the future. This Roundtable will combine keynote speeches with interactive discussions in three different sessions. A summary session will close the meeting.

Purpose of the Roundtable:

To gain insights from key stakeholders on the status of hydrogen and fuel cell technology, the progress made and the remaining commercialization challenges.

Focus Areas for the Roundtable:

- Technical readiness:
 - Emphasize "readiness" of technology and closeness to market – emphasis on achievements, market prospects, remaining technical and non-technical barriers (risks) for their commercialization
- The role of private sector:
 - Highlight the capacity of the business sector to create jobs
 - Identify specific contributions of the private sector
- The role of the public sector (including IPHE):

¹ This Task Force was named Ministerial Task Force and called up in Action Item 12 (Meeting Minutes, 14th IPHE SC Meeting, p. 17).

² Proposed date: The date doesn’t seem to come across another important H₂FC event. The 4th FCH JU Stakeholders General Assembly is scheduled for November 22-23, 2011, Brussels.

- Identify the instruments that the public sector (both at national and local levels) can use to facilitate, encourage and support industry to provide commercially viable products.
- Provide feedback to the IPHE Steering Committee on the planned future role of the partnership.

Background

The creation of "The International Partnership for Hydrogen and Fuel Cells in the Economy" (IPHE) was an initiative facilitated by the U.S. Department of Energy and the U.S. Department of Transportation in 2003, to foster international cooperation on hydrogen and fuel cell R&D, common codes and standards, and information sharing on infrastructure development. On November 20th, 2003, the representatives of fifteen countries and the European Commission signed the Terms of Reference of the IPHE in Washington, and made commitments to accelerate the development and commercial use of hydrogen energy technologies in order to improve energy security, competitiveness and environmental concerns and global climate change. Today, IPHE's partners coordinate multinational research, development, and deployment programs that advance the introduction of hydrogen and fuel cell technologies on a global scale. Although IPHE focused mainly on R&D activities in its early years, its work has evolved to a more policy oriented focus, particularly around accelerating commercial adoption.

These Terms of Reference commenced on November 20, 2003, and will continue for 10 years unless extended or terminated by the Steering Committee. These Terms of Reference may be modified, extended or terminated in writing at any time by consensus of the IPHE Steering Committee.

Hydrogen: a crucial future energy carrier

Recent studies in different countries have concluded that, in the future, alternative fuels options such as electricity, hydrogen, bio fuels, synthetic fuels, methane or LPG will gradually become a much more significant part of the energy mix. There is no single alternative. Each will have a different and complementary role and all need to be exploited. Hydrogen has specific challenges and barriers to be overcome in the areas of its production, distribution, storage and use. The potential solutions and responses to these challenges will significantly benefit from international cooperation.

Fostering a favourable policy framework

The IPHE has encouraged collaboration among the members to advance hydrogen and fuel cell technologies and contributed to promoting policy initiatives aimed at introducing these technologies into our global energy systems by taking advantage of national expertise. From the beginning, it has been a "learning organisation", open to new ideas and responsive to emerging issues, opportunities and challenges. It has contributed to developing and strengthening the relationships in R&D and the capacity building among the partners in ways that may not have been possible elsewhere and has also complemented efforts of other

international forums such as IEA. However, the IPHE influence on the strategies and policies of its members has been limited.

There remain substantial challenges to de-risk the steps needed to build up hydrogen production and distribution capacity as well as to commercialize its end use applications and their supporting infrastructures. De-risking requires co-ordinated and concerted effort between the industry, financial and public sectors to secure a stable policy environment within which investment decisions can be made.

Advancing towards the market entry

During the last decade we have seen a rapid pace of innovation and technical progress in all categories of fuel cells and hydrogen applications, as well as in policy and regulatory development. For instance, the success of hydrogen bus and passenger car demonstration projects have proven that hydrogen vehicles can meet performance, safety and reliability targets and also meet public expectations for mobility. However, affordability requires large scale production volumes and this cannot be achieved without suitably phased and progressive roll out of vehicles and other applications along with the necessary hydrogen infrastructure. This implies very substantial and sustained investments in the order of hundreds of billions of dollars over a period of 30 years.

Today some premium applications (e.g. portable generators, vehicles such as specialty vehicles for materials handling applications, micro-fuel cells for handheld electronic devices) have already entered the market and compete successfully with traditional technologies. Furthermore, fuel cells and hydrogen are already commercially available as back-up power systems (e.g. in manufacturing and telecoms industry) and in Combined Heat and Power (CHP) applications. Also, large demonstrations of residential-use PEMFC based systems producing hot water, heating and electricity (~1 kW) have shown better performance and environmental advantages than conventional systems. With the appropriate incentive measures to make these technologies more cost-competitive, they could soon enter the market. Furthermore, demonstrations of the use of hydrogen and fuel cells to store excess renewable solar and wind energy are showing that it could be an efficient mechanism to balancing the electricity grids for on-peak electricity production.

However, the mass markets for all these applications, particularly for those with the strongest potential for addressing climate change and energy security issues (e.g. road transport) will not be possible without strong political will and support in the form of incentives and coordinated action.

Hydrogen and fuel cells: part of a portfolio of future energy technologies

Most governments state an interest in supporting a portfolio of multiple, advanced technologies to meet their energy, transport and environment goals, including hydrogen and fuel cells, battery and plug-in electric vehicles and biofuels. However, due to the economic crisis and other factors, some governments are emphasizing specific technologies that can be implemented in the short term at the expense of others that require long-term R&D efforts. As

a consequence, such policies limit the identification of the most appropriate mix of the technologies that have the potential to meet environmental and energy challenges.

In the transportation sector, a recent in-depth study performed in the EU using factual data from the industry supports this portfolio approach. The study concludes that fuel cell electric vehicles (FCEVs) and battery electric vehicles (BEVs) have significant potential to reduce CO₂ and local emissions and that both will be viable and complementary alternatives to conventional internal combustion engine (ICE) vehicles by 2025, or earlier with appropriate tax exemptions and/or incentives. The study also estimates that over the course of the next few decades, costs for a hydrogen distribution and retail infrastructure will be comparable to those for a dedicated infrastructure for BEVs and plug-in hybrids (PHEVs).

IPHE Future activities

IPHE should focus on identifying means to accelerate the deployment and market introduction of hydrogen and fuel cell technologies. Coherent actions will be needed to ensure that they are part of the global future energy portfolios, in particular:

- Promote intergovernmental exchange on technology developments, fuel supply chain analysis, impact assessments of various policy options on technology development and deployment;
- Continue the on-going work on non-technical barriers such as education/public outreach, skills and training; codes, standards and regulations;
- Regularly review progress and assess competing technologies;
- Pool ideas for market stimulation in different IPHE member countries such as technology neutral policy incentives (e.g. feed-in tariffs, Renewable Portfolio Standards, regulations for buildings); public procurement; use of hydrogen as carrier for supplying both stationary and transport needs (i.e. CHP and cars);
- Address the issues associated with developing the required infrastructure.

Partnership with the industry and local communities

Industry has been the major driver behind the development of hydrogen and fuel cells, with governments playing a catalysing role in the process. The R&D programmes of many IPHE members are being jointly developed and implemented by strong public-private partnerships using collaborative schemes and financing instruments that facilitate an efficient use of scarce resources. Governments and companies (vehicle OEMs, energy suppliers and fuel cell manufacturers) need to strengthen cooperation under a common roadmap to support full, self-sustained commercialization.

Other important stakeholders are those local communities (i.e. regions, states, municipalities, cities, etc.) which work closely with business and technology/innovation providers and which have an influence on the urban and regional development and infrastructure decisions at local

level and are early adopters of innovative technologies (e. g. procurement of public fleets). They can clearly support demand and market viability of hydrogen and fuel cell technologies.

Need for an IPHE - Stakeholders meeting

The IPHE has operated so far within a context of many stakeholder organizations, including industry, but the main actors have been governments. Although a number of industry representatives and local/regional authorities have been periodically invited to participate at the meetings of both the Steering Committee and the former Implementation Liaison Committee (ILC) and several technical workshops have been organised in the last two years (e.g. Stationary Applications in Japan in March 2011), there has not been a systematic collection of input from these important stakeholders. **An "IPHE - Stakeholders" roundtable, practical and outcome-oriented, involving the Steering Committee and selected representatives from key sectors is therefore considered timely and appropriate.**

This meeting will be important to discuss the new IPHE charter of activities and to collect input from the private sector on the progress made on these technologies and the policy framework needed for commercialisation. During this meeting the following aspects will be addressed inter alia:

- Progress made on the technologies: achievements, market prospects, remaining technical and non-technical barriers (risks) for their commercialization
- What more specific actions can governments undertake to reduce the barriers?
- Which instruments can the public sector (both at national and local levels) provide the industry to help move products to the market and to develop an innovation chain of such a scale?
- How can the private sector contribute to these efforts?
- What needs to be done to facilitate user adoption?
- How can IPHE contribute to these efforts?

The expected outcome will be recommendations regarding the basic steps that government and industry should follow and the role that IPHE can play to encourage widespread commercialization of these technologies.

To realize such a meeting and accomplish these goals the following structure, agenda and set up are proposed as in Annex I:

Annex I - Agenda for the Stakeholders Roundtable

Morning Session – Key Note Speeches	
09:00 – 09:15	Opening of SC IPHE Chair (Master of Ceremony)
09:15 – 09:30	Welcome by Host Country
09:30 – 10:45	<ul style="list-style-type: none"> • 4-5 Keynote Speeches of “H2FC Champions” from various fields: scientific/R&D, industry, energy sector, economy/finance, environment (max. 15min each speech) • Three key messages have been defined and should be emphasized in the keynote speeches: <ol style="list-style-type: none"> 1. H2FC technology is ready for the market 2. H2FC technology is a real business case already 3. H2FC is a solution to solve future challenges in regards to energy security, CO2 reductions and climate change <p>➔ <i>These messages should prepare the framework for the following panel discussions and identify the main topics to be addressed by policy makers.</i></p>
10:45 – 11:15	Coffee Break
Panel Discussions with short Introduction Presentation	
<u>Preparation of Panel Discussions</u>	
<i>The Task Force suggests providing guidance (e.g. through questionnaires) to participants of the moderated panel discussions. This may require collecting feedback in advance of the roundtable for use by the moderator in preparation for the session. The received input will also be the basis for the preliminary conclusions of the meeting.</i>	
<u>Composition of Panelists</u>	
<i>We are seeking for a balanced sector and geographical representation in each moderated session. The desired composition of speakers for the sessions is: 2-3 industry representatives, 1 financial and 1 research representative.</i>	
11:15 –12:30	<p>1. Moderated Panel Discussion on Transport Applications and Related Infrastructure</p> <ul style="list-style-type: none"> • Participants: 4-5 Panelist • 5 min. - introductory presentation of the moderator • 20 min. - short statement (~ 5 min.) by each panelist • Panel discussion including participation from the floor in particular

	governmental representatives
12:30 –13:30	Lunch
13:30 –14:45	<p>2. Moderated Panel Discussion on Renewables & Hydrogen</p> <ul style="list-style-type: none"> • Participants: 4-5 Panelist • 5 min. - introductory presentation of the moderator • 20 min. – short statement (~ 5 min.) of each panelist • Panel discussion incl. participation from the floor in particular governmental representatives
14:45 –16:00	<p>3. Moderated Panel Discussion on Stationary Applications</p> <ul style="list-style-type: none"> • Participants: 4-5 Panelist • 5 min. - introductory presentation of the moderator • 20 min. - short statement (~ 5 min.) by each panelist • Panel discussion including participation from the floor in particular governmental representatives
16:00 – 16:30	Coffee Break
Moderated Summarizing Session	
16:30 –17:00	Summarizing discussion and outcome of the day

Set-Up

The proposed set-up would be a roundtable. The best way of arrangement of the roundtable and details of organization still needs to be determined. These details might be discussed at the next meeting of the IPHE Steering Committee.