IPHE Stakeholders' Roundtable
Berlin, Germany
Nov 17, 2011

Public Conference Report

DRAFT

Introduction

On November 17, 2011, the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE) hosted a stakeholder roundtable meeting in Berlin, Germany. The roundtable was attended by over 80 invited representatives from industry, governments and R&D, and intended to gather perspectives on the status of hydrogen and fuel cell technologies toward commercialization and integration in global energy systems, as well as to identify needs of industry and government going forward.

IPHE has served as a platform for governments to exchange on its hydrogen and fuel cell programs since 2003. Taking into account the achievements in performance and cost reduction since then IPHE is planning to build upon the presentations and the discussions at the roundtable to focus its actions to ensure that hydrogen and fuel cells achieve their full potential in helping to solve the world's energy problems.

Roundtable Format

The meeting began with a welcome from the IPHE Chair, and from the government of the host country, Germany. This was followed by a keynote session featuring perspectives from five companies in the automotive, infrastructure, and stationary fuel cell space. Three panel sessions were then held, focusing on Transport Applications, Renewables and Hydrogen, and Stationary Applications respectively. In each panel session, four representatives from companies or organizations in each space gave brief overviews followed by a moderated discussion among the panelists and the audience of stakeholders. Presentations from the meeting can be found here: http://www.iphe.net/events/meetings/stakeholder_roundtable.html

Key Messages from Industry

Throughout the day and across application areas, several themes appeared continuously:

- **The technologies are ready.** It was stressed that hydrogen and fuel cell technologies are ready for the market in some application areas. R&D in recent years has removed nearly all technical barriers to widespread use of the technologies, and demonstrations have proven that they are ready for everyday use. Currently, early markets are developing and approaching volume sales. Major global car manufacturers announce volume sales of fuel cell vehicles to begin in the 2014/15 time frame.
- **Hydrogen is ready to play a larger role in the energy portfolio of many countries.** Based on the technology readiness described above and vis-á-vis the potential for hydrogen and fuel cell technologies to reduce greenhouse gas emissions, increase energy security, reduce local emissions, and contribute to storing renewable energy, stakeholders agreed that these technologies need to be incorporated into governments' long-term energy forecasts and strategies including appropriate policy frameworks.
- **Fuel cells are predominately a substitution technology.** In nearly all applications, fuel cells fill a role currently filled by an existing technology. This means that fuel cell products must outperform these existing technologies in order to succeed in the market – which they do in some specific applications e.g. by extended run times, CO2-free power supply or high efficiency.

Examples of Achievements across applications and across the world

The presentations from Industry can be summarized by "we are ready". Examples of major achievements that were presented include:

- There are 200 fuel cell vehicles on the road today in California proving customer acceptance – and many more in other successful demonstration programs worldwide.
- Daimler recently drove three fuel cell vehicles around the world as part of their F-Cell World Drive Event proving its reliable operation.
- China has successfully demonstrated over 200 fuel cell vehicles in public operation.
- Toyota has achieved dramatic fuel cell vehicle cost reductions announcing start of commercial sales in 2015.
- Fuel Cell Energy is currently preparing the installation of stationary fuel cells adding up to 60 MW in co-generation systems; overall 182 MW of stationary fuel cell power is installed or under order.
- GM has demonstrated over 50,000 miles driven by fuel cell vehicles with its global fuel cell vehicle fleet.
- The EU-funded HyFLEET CUTE program has transported over 8.5 million passengers in hydrogen-powered buses.
- Media coverage of the Intelligent Energy fuel cell London taxi has reached over 700 million people.
- Governments worldwide committed over 1 billion USD in 2010 for hydrogen and fuel cell RD&D.
- Japan has installed over 10,000 residential fuel cell units.

Moving Forward

The presentations from industry showed clearly that hydrogen and fuel cells are technically ready for mass market deployment. The discussions clearly outlined what needs to happen on the non-technical side to drive commercialization of hydrogen and fuel cell technologies and allow their potential to be met.

- **Government Support.** Governments can support the continued commercialization of hydrogen and fuel cell technologies in several ways. Through policy measures such as:

- Tax incentives which can increase deployment volumes allowing for economies of scale.
- Performance-based incentives that are stable during the transition from proven technology to commercial product.
- A harmonized policy framework across countries in support of the fact that many companies are acting globally.

Governments can also support market development by acting as early adopters of the technology by requiring or encouraging their agencies to purchase fuel cell products. Government support will also be needed for development of infrastructure.

Although it is clear that government support is key for driving commercialization at the current point in time, it is also important to set a goal of transitioning to an industry that is not dependent on government subsidies.

- **Infrastructure.** Infrastructure is a key factor for the widespread commercialization of fuel cell technologies, particularly in the transport sector. Both government support and industry cooperation are seen as essential for development of an effective infrastructure, and these two groups must work together closely to eliminate the first-mover disadvantage.

- **International Cooperation and Coordination.** Countries should coordinate the timing of technology deployment in order to generate volume demand. International cooperation of governments is also essential for minimizing market barriers associated with Regulation, Codes and Standards (RCS) requiring a consistent and harmonized approach. Cooperation is also important as the industry works to educate governments and the general public on the role of hydrogen and fuel cells.

- **Investment/financing.** There is still significant risk in the business case for using hydrogen and fuel cells, and governments and industry should find ways to share this risk. From a long-term investment perspective, the business case needs to be strengthened and the risk reduced.

- **Emphasis on Integration of Renewables.** One advantage of hydrogen and fuel cell technologies is their potential to play a significant role in optimizing the use of renewable energy generation, through storage and off-peak hydrogen production. This role needs to be emphasized, developed, and communicated. Educational activities should focus on high-impact/high-visibility, like the Olympics and the World Expo.

- **Emphasis on benefits – economic, environmental, social.** Hydrogen and fuel cell development and use creates sustainable jobs and can strengthen national economies, in addition to its environmental benefits.

Conclusion

Hydrogen and fuel cell technologies are technically ready. Industry and government alike must focus on the non-technical barriers to widespread commercialization that still exist. Infrastructure and

investment risk are two areas where stakeholders in multiple segments must jointly work together to coordinate efforts and share expense and risk. Knowledge of hydrogen and fuel cell technologies and their potential, needs to be improved – among government officials, other industry sectors, and in the general public.

IPHE can help play a role in overcoming these barriers by helping to develop appropriate frameworks, by engaging and educating governments, and by continuing to encourage the interchange of ideas and information among industry, government and other stakeholders.

The promise of hydrogen and fuel cell technologies is clear and it is poised to play an important role in the world's future energy mix if these challenges can be met.

Appendix A: Attendees

(list of companies and institutions who attended)

A
Air Products
Austrian Agency for Alternative Propulsion Systems (A3PS)

B
Ballard Power Systems
Brazilian Fuel Cell Bus Project
Brazilian Reference Center on Hydrogen Energy

C
California Fuel Cell Partnership
CEA France
Centre for Solar Energy and Hydrogen Research (ZSW)

D
Daimler AG
Danish Partnership for Hydrogen and Fuel Cells
Department of Resources, Energy and Tourism Australia
DG Move - European Commission

E
EERE - Office of Energy Efficiency and Renewable Energy of the U.S. Department of Energy
Electrical Energy Research Center, Eletrobras/CEPEL
EnergieAgentur NRW
Energy Federation of New Zealand
Enertrag AG
Environment Park, Vice Chair HyRaMp
European Commission – DG Research

F
Fuel Cell and Hydrogen Joint Undertaking
Federal Ministry of Economics and Technology Germany
Federal Ministry of Transport, Building and Urban Development Germany
FuelCell Energy

G
General Motors

H
Hydrogen Technologies (formerly StatOil and Hydro Electrolysers)
Hynergreen Technologies, S.A.
Hyrdogenics Corporation
Hyundai

I
Icelandig New Energy
Industry Canada
Inha Universiy Korea
INMETRO - National Institute of Metrology, Quality and Technology Directorship of Scientific and Industrial Metrol
Intelligent Energy

K
Korea Energy Management Corporation

L
L'Air Liquide

M
Ministry of Energy and Environment France
Ministry of Infrastructure and the Environment Netherlan
Ministry of New and Renewal Energy India

N
Nedstack
NOW GmbH

P
Panasonic
Panasonic Industrial Europe GmbH
Proton OnSite

R
ReliOn

S
Shanghai Automotive Industry Corporation
SOFC Power Italy
Stichting Carbon Light Mobility
Sunrise Power Co.

T
Technova
Tongji University China
TOTAL
Toyota
Transnova

U
U.S. Department of Energy
UK Energy Research Center
US Fuel Cell and Hydrogen Association
US Fuel Cell and Hydrogen Association
UTC Power Corp.

V
Vaillant GmbH

Appendix B: Agenda

International Partnership for Hydrogen and Fuel Cells in the 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.

The IPHE is a unique international mechanism for national government representatives of 17 countries and the European Commission to better coordinate activities and share best practices regarding the acceleration of hydrogen and fuel cell commercialization globally.

Roundtable Meeting "IPHE – Hydrogen and Fuel Cells Stakeholders"

November 17th, 2011 | Berlin, Germany

Auditorium Friedrichstrasse
Im Quartier 110, 4th floor
Friedrichstrasse 180
10117 Berlin
www.auditorium-friedrichstrasse.de

The goal of the roundtable is to facilitate and stimulate a constructive dialogue between senior representatives from the hydrogen and fuel cells stakeholders' community, in particular industry, and from governments of IPHE countries. The meeting aims to gain insights from key stakeholders on the status of hydrogen and fuel cell technology, the progress made today and the remaining commercialization challenges as well as to discuss the role that the public sector can play to support industry's efforts.

Roundtable Agenda *(tentative)*

Time	Agenda Item	Topics to be addressed	Speakers
8:30-9:00	Registration		
9:00-9:15	Opening by the IPHE Chair	Welcome, introducing IPHE and setting the frame for the meeting	**Nilguen Parker**, IPHE Chair, Federal Ministry of Transport, Building and Urban Development, *Germany*
9:15-9:30	Welcome by the Host Country	Overview of Germany's strategy in regards to H2FC technology	**Rainer Bomba**, State Secretary of Germany's Federal Ministry of Transport, Building and Urban Development
9:30-10:45	Keynote session	The keynote session will consist of 5 keynote speeches. The keynote speeches will present the visions of the respective companies, their future needs and the public support they require in order to commercialize H2FC technologies. The speeches will also prepare the following three panel discussions.	• **Dirk Weigand**, Director Automotive Issues, Daimler AG, *Germany (Moderator)* • **Pierre-Etienne Franc**, Director of "Technologies for the Future", Air Liquide, *France* • **Chendong Huang**, Deputy General Manager, New Energy Vehicle Division,Shanghai Automotive Industry Corporation, *China* • **Katsuhiko Hirose**, Project General Manager, Toyota, *Japan* • **Chip Bottone**, President and Chief Executive Officer, FuelCell Energy, *USA*
10:45-11:15	*Coffee break*		

The three panels will address the relevant aspects of each application field and lead into an active discussion with the debaters on stage and the audience. The four panelists of each panel will start with 5 min statements, followed by a moderated discussion with the audience. The further audience consists of government representatives from the 18 IPHE countries as well as of high-level industry, research and public representatives.

11:15-12:30	Panel Discussion on **Transport Applications**	This panel addresses relevant aspects for transport applications such as deployment strategies, roadmaps, public support and how industry approaches the introduction of H2FC technologies into the market	• **Philippe Mulard**, Hydrogen Program Manager, TOTAL, *France (Moderator)* • **Dennis Hayter**, Vice President Business Development, Intelligent Energy, *UK* • **Charles Freese**, Executive Director Global Fuel Cell Activities, General Motors, *USA* • **Byung Ki Ahn**, General Manager, Fuel Cell Vehicle Team 1, Hyundai Motor Company, *Republic of Korea*
12:30-13:30	*Lunch break*		
13:30-14:45	Panel Discussion on **Renewables & Hydrogen**	This panel addresses the potential role of hydrogen as a component of the global energy portfolio. With regards to renewable energies the discussion will focus on hydrogen as a storage medium, hydrogen production and paving the way for the large-scale use of renewable energy sources.	• **Catherine Dunwoody**, Executive Director California Fuel Cell Partnership, *USA (Moderator)* • **Joseph Cargnelli**, CTO, Hydrogenics Corporation, *Canada* • **Newton Pimenta**, Executive Secretary, Brazilian Reference Center on Hydrogen Energy, *Brazil* • **Davide Damosso**, R&D Director Environment Park - Vice Chair HyER, *Italy*
14:45-16:00	Panel Discussion on **Stationary Applications**	This panel discusses perspectives of the stationary market near term and in the next decades and in this respect the remaining technical, economic, and social barriers to widespread market growth. Furthermore the position of H2FC technology compared to other energy and efficiency technologies will be addressed.	• **Alberto Ravagni**, CEO, SOFC Power, *Italy (Moderator)* • **Alexander Dauensteiner**, CALLUX (Head of Product Management Innovation, Vaillant GmbH), *Germany* • **Katrina Fritz Intwala**, Government Business Development, UTC Power Corporation, *USA* • **Yukimune Kani**, Director Panasonic Fuel Cell Development Office Europe, Panasonic, *Japan*
16:00-16:30	*Coffee break*		
16:30-17:00	Conference Summary	The summary speech will provide a synthesis of the day.	**John Loughhead**, Executive Director, UK Energy Research Center, *UK*
17:30-19:00	Site Visit	Combined site visit to one of the TOTAL hydrogen stations in Berlin with a ride and drive. Those who are not interested in joining the site visit may use this time to visit the famous East Side Gallery.	
19:30-22:30	Evening Dinner	Exclusive evening dinner at an extraordinary industry-historical location - Restaurant Volt, Berlin	

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