INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE[1] Communiqué

Hydrogen and Fuel Cells – A Clean, Real, and Global Opportunity

Grenoble, 1 December 2015 – Representatives from member countries of the IPHE met this week in Grenoble to consider the future opportunities and challenges in the use of hydrogen and fuel cell (HFC) technologies to address the pressing issues of clean energy and the environment. HFC technologies offer a way to enable clean energy systems, to enhance energy security, to address local environmental goals, and to contribute to economic growth. Hydrogen and electricity are two complementary and viable energy carriers available now that can help effectively decarbonize our energy systems for stationary and transportation applications. HFC technologies can use a wide variety of low carbon energy sources, from intermittent renewable electricity generation to biomass to chemical waste streams, store and then provide energy when needed, and in so doing can substantially reduce greenhouse gas (GHG) emissions[2].

The global fuel cell industry reached $2.2 billion in revenue in 2014, with nearly 30% annual growth in fuel cell shipments worldwide since 2010. Approximately 50,000 fuel cells were shipped worldwide in 2014, demonstrating worldwide commercialization[3].

Today, HFC technologies are not just used in fuel cell electric vehicles (FCEV) but also in:

- combined heat and power (CHP) units (in Japan, more than 141,000 FC-based CHP units are installed[4]);
- back-up power systems (as of April 2015, more than 6,400 units shipped or on order in the U.S.[5]);
- warehouse material handling units (as of April 2015, over 9,000 units are in operation or on order in the US[6]); and,
- portable power devices (more than 33,000 units sold[7]).

Sustained global research, development, and demonstrations by industry and government have led to a significant level of technology maturity and early market deployment.

FCEVs have demonstrated significant efficiency gains over internal combustion engine vehicles on a tank-to-wheel basis[8]. Using hydrogen with fuel cells in transportation systems can reduce greenhouse gas emissions as these FCEVs only produce water as a by-product and if the hydrogen is from renewable or low carbon sources, can eliminate these emissions. Major automotive companies are committing to FCEVs in response to environmental and long-term energy goals[9]. Further work is needed across the innovation spectrum to get costs down and to get infrastructure in place to take advantage of these technologies. Industry and governments are taking action. With over 80 hydrogen refueling stations in Japan and the establishment of public-private partnerships such as H2 Mobility in Germany and H2USA in the United States, there is a clear commitment from all stakeholders to capitalizing on the potential of HFC technologies to meet the pressing issues today of clean energy and environment.

The world has used hydrogen safely for decades in food products, chemical processes, semiconductor fabrication, and refined oil products. As hydrogen capacity builds and competitive fuel cell systems continue to develop for portable, stationary power and transportation markets, hydrogen and fuel cell systems can complement and gradually replace unabated fossil-fuelled systems. This will help facilitate the further increase of renewable power production and thus the overall transition to clean and sustainable transportation and energy systems.

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Endnotes:

1. The IPHE facilitates member partners to collaborate on international research, development, demonstration, and deployment activities related to hydrogen and fuel cell (HFC) technologies. Partner countries commit to work to advance the commercialization of HFC technologies to help improve the energy supply and environment. Member countries represent approximately 66% of the global GDP, more than 75% of global energy use and more than 66% of GHG emissions. For more details on the IPHE go to http://www.iphe.net/
2. For further details, see the IEA Technology Roadmap Hydrogen and Fuel Cells at http://www.iea.org/publications/freepublications/publication/TechnologyRoadmapHydrogenandFuelCells.pdf
3. See http://energy.gov/sites/prod/files/2015/10/f27/fcto_2014_market_report.pdf
4. See http://www.meti.go.jp/committee/kenkyukai/energy/suiso_nenryodenchi/pdf/005_01_00.pdf
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8. Source: http://cafcp.org/sites/files/W2W-2014_Final.pdf
9. See http://www.toyota-global.com/innovation/environmental_technology/fuelcell_vehicle/; http://world.honda.com/FuelCell/; http://www.afcc-auto.com/