Hydrogen and Fuel Cells in Canada Country Update

20th IPHE Steering Committee Meeting City of Fukuoka, Japan November 20-21, 2013





Energy Storage Systems "Power-to-Gas (P-t-G)"

- Canadian firm Hydrogenics Corporation in partnership with Enbridge
 - Canada's largest natural gas distribution company
 - To develop a utility scale P-t-G energy system in North America
 - Using existing natural gas pipeline

- Germany's (E.ON) first P-t-G Plant in Falkenhagen
 - E.ON, one of the world's largest power and gas companies
 - Canadian Technology from Hydrogenics Corporation
 - Using surplus renewable energy to produce H2 for storage in the country's existing natural gas pipeline network





Canadian Fuel Cell Supply Chain

- Commissioned a supply chain development project with the Automotive Parts Manufacturers Association of Canada (APMA) to:
 - Assess Canada's capabilities in the FC supply chain
 - Identify supply gaps
 - Create a database of Canadian suppliers
 - Most importantly, engaged stakeholders

Findings:

- Wide range of capabilities in Canada
- Engage & establish business relationships
- Gaps are addressable
- Suppliers generally not aware/focused on FC related opportunities
- Traditional auto suppliers wary of the infrastructure & tooling costs associated with new production lines
- APMA, Canadian Hydrogen and Fuel Cell Association, automotive OEMs, governments, industry & academic took positive positions to continue development





Canadian Fuel Cell Supply Chain - Partners

Associations:

- Automotive Parts Manufacturers Association (APMA)
- Canadian Hydrogen and Fuel Cell Association (CHFCA)

• Industry:

- Mercedes Benz Fuel Cells (MBFC)
- Ford /Automotive Fuel Cell Cooperation (AFCC)

Government:

- Industry Canada
- Department of Foreign Affairs & Trade Development (DFATD)
- National Research Council (NRC)
 - Automotive & Surface Transportation (AST) portfolio
 - Energy Mines & Environment (EME) portfolio

Academia:

- University of British Columbia
- Simon Fraser University
- University of Victoria





Canadian Fuel Cell Supply Chain –Next Steps

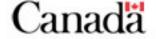
- APMA will maintain/host/promote the database
- Additional stakeholder & OEM engagement
 - Broaden participation
- Building on APMA project create a national Canadian FC Supply Chain Alliance to:
 - Create symbiotic relationships between FC automotive OEMs and current and potential suppliers
 - Improve manufacturing processes and testing methods
 - Attract additional foreign direct investment to Canada
 - Develop a strong supply chain for low cost FC components in Canada





Canadian Industry Developments

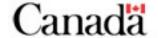
- > Agreements between Ballard Power Systems and Azure Hydrogen
 - For China Fuel Cell Bus Program (\$11M for initial 12 months)
 - Supply agreement for backup power systems in China
- ➤ The world's largest Power-to-Gas facility (2MW) is now operational with Hydrogenics technology
- Hydrogenics awarded a contract for a fueling station in Bolzano, Italy
- Daimler, Ford and Renault-Nissan signed a 3 way agreement to develop common FC system for 2017





IEA - H2 Technology Road Map

- Regional Workshops in Europe, North America and Asia
 - North America workshop to take place in Washington D.C in Q1, 2014
 - H2 stakeholders from Industry, academia and government
 - Potential topics:
 - H2 in transport
 - H2 as a storage medium
 - H2 infrastructure
 - Role of Policy
 - Provide input to the H2 Road Map



Questions?

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