

Hydrogen Infrastructure Sub- Committee Report

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Topical Areas

- Announcements of R&D on hydrogen storage, hydrogen compression, liquefaction
- Hydrogen source developments including hydrogen production/generation
- Hydrogen fuel station installations and network
- Related studies and activities such as sensor development, hydrogen purification

1. R&D on Hydrogen Storage

Solid State Storage

- New materials
 - Cella : microfibers
 - LBL: polymethacrylate matrix containing Mg nanocrystals
 - Purdue U & Gen'l Atomics: petallized ammonium borane
 - U. So Calif: Ru catalyzed ammonium borane
 - RIKEN: rare earth heterometallic hydride clusters
 - Cal Tech: ice

- R&D on Hydrogen Storage
Compressed and Tank Development

- BOC: lightweight hydrogen storage tank
- Horizon: hydride storage
- Airbus with Magna Steyr: to develop a highly insulated tank for aircraft

- R&D Funding

- The US-DOE continues to be a major funder of R&D for H2 storage technologies
- Major funding announcements by British Columbia and Enel in Italy

2. Hydrogen Source Developments

- Hydrogen Generation R&D and Demonstration

- Horizon fuel Cell: biohydrogen
- MIT: artificial leaf
- Ballard with GS Platech: waste to energy demonstration
- Hydrogenics: dominate the news with many electrolyzers for projects worldwide (Africa, , Asia, Europe, South America)

• New H2 Generation Installations

- Linde: hydrogen & syngas plant for China for 2014
- Ballard: received funding for distributed H2 generation in Canada
- Japan to promote the use of refinery H2 for FC cars

3. H₂ Fueling Station Installations & Networks

Fueling Stations

- Japan: Pipelines planned for Hydrogen Town Project with H₂ produced by Nippon Steel
- US: H₂ generator to be installed on Hawaii S Proton onSite
- Other US: SC, Long Island, Charlotte, Michigan, CA.
- Other: UK (Swindon and Glamorgan), Denmark (Holstebro),

4. Related Studies

- Nuvera FC & Xebec Adsorption: H2 purification units for refueling
- NexTech: H2 monitoring system

In Summary

- Industry Review 2011: The FC numbers continue to increase. 2011 shipments of over 285,000- a 25% increase over 2010 and PEMFC are over 95% of total and North America 50% share of total.
- Applications are expanding beyond demonstration to meet energy demands

