

California Hydrogen Business Council March 2006 Report

Summarized in this issue (with links to complete articles):

1. Thanks for Your Support!
2. NHA/NHF2
3. California Clean Alternative Energy Act
4. Hydrogenics to Supply Hydrogen Generators in USA, Russia and Spain
5. Westport and Ford Hydrogen Engine Technology Development
6. DOE 2006 Hydrogen Roadmap and \$100 Million Research Budget
7. BP And Edison Plan \$1 Billion 500MW Hydrogen Power Plant
8. Bridging the Transition with HICES
9. Quantum Awarded Contract for H2 Hybrid SUV
10. Over 1,000 Hydrogen Riders in California
11. United States will Consume 60% More Renewable Energy by 2025
12. Farmed Renewable Energy
13. Masterflex to Supply 150 Fuel Cell Cargobikes for EU-Project
14. India Hydrogen Roadmap for 1,000,000 H2 Vehicles and 1 GW Power
15. Nippon Oil to Install 100 Ballard Kerosene-fueled Cogeneration Units
16. Cleantech Venture Forum in San Francisco Mar 21-23
17. Farewell to Our Friend Dennis Weaver
18. Future CHBC Meeting Dates - Save These Dates
19. Silver and Gold
20. 2006 Board of Directors
21. Send Us Your News!

1. Thanks for Your Support!

CHBC welcomes new Individual member David Jewel, and thanks our many Silver and Individual members who have renewed recently. We truly appreciate your support and couldn't be here without you! Thanks too to Bay Area AQMD and EmeraChem for their sponsorship of our recent General Meeting in San Francisco. Moving to a new venue broadened our audience and enabled our Northern California members to enjoy reduced travel time and expense. Thanks to all who made it such a successful event. We'll be back in the area next year.

2. NHA/NHF2

CHBC is an Endorsing Sponsor of both (1) the 2006 NHA Conference and Hydrogen Expo and (2) the National Hydrogen Financing Forum, to be held in Long Beach in March. The NHA Conference and Expo (March 12-16) is expected to draw over 1,000 attendees and hundreds of exhibitors. Included are technical workshops on industry issues, high-level international keynote speakers, and a "Ride 'n' Drive" event. A highlight will be the presentation of the 2006 Meritorious Service Award to CHBC President and Program Chair Hank Wedaa. The second annual Hydrogen Financing Forum follow on March 16, headlined by speakers Terry Tamminen and Dr. Alan Lloyd.

<http://www.hydrogenconference.org>

<http://www.nhf2.com>

3. California Clean Alternative Energy Act

A California constitutional amendment taxing oil production to fund a range of alternative energy efforts may go to voters this November, setting up a nine-month battle between environmentalists and oil companies. Some big names in California business including movie producer Steven Bing and Silicon Valley venture capitalist Vinod Khosla will help fund the 'Californians For Clean Alternative Energy' effort to get the measure on the ballot and convince voters to approve it.

<http://www.californiahydrogen.org/page.cfm?content=20&display=48>

4. Hydrogenics to Supply Hydrogen Generators in USA, Russia and Spain

CHBC Gold Member Hydrogenics Corp. was awarded a contract by Basin Electric Power Cooperative to supply an electrolyzer-based hydrogen refueling station for installation in Minot, North Dakota. Hydrogenics is supplying the core electrolyzer module as well as compression, storage and dispenser equipment as part of the contract. The station is one of the first United States-based hydrogen fueling stations to use electricity from a wind power resource to produce hydrogen from water. Hydrogenics has also supplied an onsite electrolysis-based HySTAT-A Hydrogen Plant to OAO NSCHK, a state-owned utility in Novosibirsk, Russia. The high-purity hydrogen produced by the 240Nm³/hr hydrogen generator will be used in the chemical processes at the nuclear power plant. In Spain, Gas Natural will use a Hydrogenics' HySTAT-A Hydrogen Station at the Sotavento Galicia wind farm to produce up to 60 Nm³/hr of hydrogen. The hydrogen will be used to fuel an internal combustion engine generator, which in turn will supply electricity to the electric grid. Hydrogenics Corp. announced the appointment of John Werderman as vice president of business development to lead market development and sales efforts for the Power Systems Business Unit.

http://www.hydrogenics.com/ir_newsdetail.asp?RELEASEID=184257

http://www.hydrogenics.com/ir_newsdetail.asp?RELEASEID=184896

http://www.hydrogenics.com/ir_newsdetail.asp?RELEASEID=186066

5. Westport and Ford Hydrogen Engine Technology Development

Westport Innovations Inc. and Ford Motor Co. recently announced a project to develop and demonstrate an advanced direct injection fuel system for vehicles powered by high-efficiency, high performance engines operating on pure hydrogen. Dr. Michael Gallagher, Westport's President and Chief Operating Officer, said that the U.S. Department of Energy (DOE) would also be teaming with Westport and Ford on the further development of Westport's hydrogen direct injection (H₂DI) technology.

<http://www.westport.com/index.php>

6. DOE 2006 Hydrogen Roadmap and \$100 Million Research Budget

Under the DOE plan, \$100 million over four years will go to research projects to improve fuel cell membranes, develop innovative fuel cell concepts, and study the effects of impurities on fuel cell performance and durability, among other things. Significant challenges must be overcome to move from today's components and systems, built using laboratory-scale fabrication technologies, to high-volume commercially manufactured products. This DOE Hydrogen Program activity focuses on R&D of manufacturing

processes to reduce the cost and enhance the reliability of critical components and systems. Critical manufacturing needs for the initial transition to a hydrogen economy include distributed production and delivery, on-board vehicle storage, and polymer electrolyte membrane fuel cells. DOE maps the path to a hydrogen-powered future in its Roadmap on Manufacturing R&D for the Hydrogen Economy (PDF 2.04 MB).
<http://www.hydrogen.energy.gov/manufacturing.html>

7. BP and Edison Plan \$1 Billion 500MW Hydrogen Power Plant

Clean-burning hydrogen gas would be squeezed from refinery waste for a 500MW power plant near Los Angeles under a plan announced in early February by BP and Edison officials. Taking aim at the environmental benefits of recycling spent chunks of petroleum coke while dramatically limiting emissions of carbon dioxide, the BP Carson refinery hopes to open a hydrogen-fueled power plant by 2011 in partnership with Edison International, the parent company of Southern California Edison. BP Carson will begin a year-long feasibility study that will determine if the plan is commercially viable.
<http://www.dailybreeze.com/news/articles/2297671.html>

8. Bridging the Transition with HICEs

WestStart-CALSTART in its quarterly Hydrogen Bus Source report discusses HICE and fuel cell progress in heavy vehicles.

http://www.calstart.org/programs/FuelCell/Hydrogen_Bus_Source_Issue_3_January_2006.pdf

9. Quantum Awarded Contract for H2 Hybrid SUV

Quantum Fuel System Technologies Worldwide, Inc. has been awarded a contract to develop a hydrogen-fueled Ford Escape Hybrid vehicle for the U.S. Army National Automotive Center (NAC). Under the contract, Quantum will evaluate different hydrogen fuel system configurations, considering the feasibility of bi-fuel and dedicated hydrogen systems. Quantum will develop an advanced hydrogen storage system, fuel injection system, and electronic controls. Work will be conducted by Quantum at its Advanced Vehicle Concept Center in Lake Forest, CA.

http://www.qwww.com/about/news_events/index.php

10. Over 1,000 Hydrogen Riders in California

As 2005 drew to a close, over 1,000 Californians were taking regular rides in hydrogen-fueled cars, SUVs, trucks and high-capacity hydrogen buses. Scheduled deliveries could double the number of hydrogen vehicles in California in 2006, and by 2009, as many as 10,000 people a day could be riders in hydrogen vehicles. By 2012, the number could reach 100,000 riders. Both forecasts assume that vehicle growth will slow to 70% per year in 2007.

http://www.greencoast.org/blog/authors/john_addison/2006/02/over_1000_hydro.php

11. United States will Consume 60% More Renewable Energy by 2025

The increase in renewable energy consumption from 6.0 quads in 2004 will result from programs at the state level, including renewable portfolio standards, mandates and goals for green power, technological advances, higher prices for oil and natural gas, and the

effects of federal tax credits, explains the latest Annual Energy Outlook, released by the Energy Information Administration. In the 2005 Outlook, total renewables were projected to be 8.5 quad in 2025 while, in the 2006 version, 60% of the projected demand for renewables is for grid-tied green power, cogeneration, with the balance for dispersed heating and cooling, industrial uses, and fuel blending. Total production of primary energy will increase at 0.9% per year from 2004 to 2030, boosting the 70.5 quads to 89.4. Oil will decline by -0.5% over the period, while dry natural gas increases 0.5%, coal rises 1.6%, nuclear increases 0.4% and renewables increase by 1.8% per year over the 25 years.

<http://www.eia.doe.gov/oiaf/aeo/index.html>

12. Farmed Renewable Energy

Large-scale capture of wind and solar energy requires the management of significant areas of land, and if the market for renewable energy continues to grow at the current rate, farmers will occupy a strategic position within the energy market within two decades. According to CarbonFree, a Cambridge UK based research company that has recently completed a study of the farmed renewable energy market, while incumbent energy producers are starting to look beyond oil and petroleum, farmers need to look beyond ethanol and start to build comprehensive energy supply businesses. According to Peter Kruger, Analyst with CarbonFree, "For several decades the energy market has been dominated by a handful of companies and closed to new entrants. Advocates of a distributed energy generation model, the so called 'Internet of Energy', are particularly interested in farmed renewable energy because this source of power is readily available and is a good fit with their plans for a reformed energy market."

<http://www.prweb.com/releases/2006/2/prweb349759.htm>

13. Masterflex to Supply 150 Fuel Cell Cargobikes for EU-Project

Masterflex AG has initiated its second fuel cell project within two months. The firm will supply fuel cell cargobikes as part of the EU HyChain Minitrans project. HyChain Minitrans encompasses the operation of 150 small and lightweight vehicles powered by fuel cells, as well as the generation, storage and logistic distribution of hydrogen. A total of more than 20 companies and research organizations are taking part, especially project leader Air Liquide from France. The EUR 17 million project is co-financed by the EU.

http://www.masterflex.de/com/index.php?news_id=597&node_id=14&category=12

14. India Hydrogen Roadmap for 1,000,000 H2 Vehicles and 1 GW Power

India's National Hydrogen Energy Board has given the green light to the National Hydrogen Energy Roadmap, submitted last year. The roadmap has estimated an investment of \$5.6 billion during 2006-2020 to be used for research, development and demonstration, and infrastructure for hydrogen production, storage, transportation and distribution. The roadmap targets one million hydrogen-powered vehicles and hydrogen-based power generation of about 1,000 MW in India by 2020.

<http://au.biz.yahoo.com/060117/17/h5vg.html>

15. Nippon Oil to Install 100 Ballard Kerosene-fueled Cogeneration Units

Ballard Power Systems reported Nippon Oil Corp. (NOC) recently announced it will begin installation of 1 kW kerosene-fueled residential fuel cell cogeneration units in Japan. From March 2006 to March 2007, NOC will place up to 100 units in homes in and around the Tokyo, Hokkaido, Tohoku and Hokuriku regions. The units incorporate Ballard's Mark 1030 fuel cell stack in a system developed by EBC that utilizes fuel processing technology developed by NOC. In other news, Ballard Power Systems' carbon fiber products subsidiary, Ballard Material Products (BMP), has been awarded an exclusive four-year contract extension for the supply of carbon friction material for automatic transmissions to an existing major automotive customer. The contract is valued at approximately US\$40 million.

http://www.ballard.com/be_an_investor/news/2005/12/19/NOC%20Release

http://www.ballard.com/be_informed/about_ballard/news/2006/01/25/BMP%20January%202006

16. Cleantech Venture Forum in San Francisco Mar 21-23

Cleantech Venture Forums draw together clean technology entrepreneurs and investors, as well as corporate executives, professional advisors, and senior policymakers in an exchange of information about cleantech business and investment opportunities. It is a venture capital forum designed specifically to facilitate the financing of companies engaged in commercializing clean technologies.

<http://cleantech.com/documents/SF%20Forum%20IX%20Overview%20Jan%2003%2006.pdf>

17. Farewell to Our Friend Dennis Weaver

As reported February 28 by CHBC, the hydrogen industry lost a charismatic friend and ardent supporter last week when Emmy award-winning actor/environmentalist Dennis Weaver died of cancer. Weaver founded the Institute of Ecolonomics, a non-profit organization, based on the belief that both our ecology and economy must be sustainable. He was 81.

18. Future CHBC Meeting Dates - Save These Dates

May 19, 2006 General Meeting at South Coast AQMD; September 15, 2006 General Meeting; December 7, 2006 Special Dinner Meeting and Holiday Party

19. Silver and Gold Members

CHBC gives a big thanks to Gold Member Hydrogenics and to our growing list Silver Members, all major contributors to our growth and success. Gold Membership includes two free registrants to all CHBC meetings for one year as well as five reduced-price registrations and other marketing benefits. To inquire about membership, contact Managing Director Catherine Rips, info@californiahydrogen.org.
<http://www.californiahydrogen.org>

20. 2006 Board of Directors

President - Henry Wedaa; Vice President - Paul Scott, ScD; Managing Director - Catherine Rips; Secretary - Josh Mauzey; Treasurer/Communications Chair: Jerald Cole; Membership Chairman - Mark Abramowitz; Northern California Membership Chair & Newsletter - John Addison; Central California Membership Chair - Gene Johnson; Program Chairman - Henry Wedaa; Director at Large - Gary Dixon; Director at Large - Jon Slangerup; Director at Large - John Williams, PE; Ex-Officio Government Liaison - Shannon Baxter-Clemmons, PhD. To contact the board, please email: info@californiahydrogen.org.

21. Send Us Your News!

We welcome important news from our members for inclusion on our website and in next month's report. Please send to: info@californiahydrogen.org. Thank you for helping build a great organization.

*CHBC Report Publisher, John Addison
Editor, Catherine Rips*