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1. Welcome New Members

California Hydrogen Business Council is pleased to welcome new Silver Member H2Scan, as well as Individual Member Henry Schneider.

[H2Scan](http://www.h2scan.com): <http://www.h2scan.com>

2. Japan Fuel Cell Market Forecast to Top US \$11.1 Billion by FY20

The domestic market for fuel cells (FCs) is estimated to grow more than 300 times its current size by fiscal 2020, per private research institution Fuji Keizai Co. The household FC market, now 3 billion yen a year, is projected at 93 billion yen in fiscal 2015 and 257.5 billion yen in fiscal 2020. In addition to mass production of polymer-electrolyte FCs starting next fiscal year by companies like Matsushita Electric Industrial Co. and Nippon Oil Corp., solid-oxide FCs are expected to increase in popularity. The market for commercial and industrial FCs is seen at 28.2 billion yen in fiscal 2020, a 44-fold increase from fiscal 2007. The automotive FC market is expected to reach 900 billion yen in fiscal 2020, 1,800 times the projected figure for the current fiscal year, underpinned by lower costs and improved durability.

[Japan](http://www.fuelcellsworks.com/Supppage9158.html): <http://www.fuelcellsworks.com/Supppage9158.html>

3. Michigan Business Review's Lifetime Innovator: Stanford Ovshinsky

His lifetime of researching ways to wean civilization off carbon-emitting fossil fuels resulted in the nickel-metal hydride battery used to power today's hybrid vehicles and in flexible solar panels. At age 85, Stanford Ovshinsky, the retired co-founder of Energy Conversion Devices Inc., remains as committed as ever to developing energy and information solutions to pollution, climate change and dependence on oil. For that, Ovshinsky recently received Michigan Business Review's Lifetime Innovator award. He is the man behind the Ovonic nickel-metal hydride battery, Ovonic hydrogen technology and the Ovonic Universal Memory, or phase-change memory, of Ovonyx Inc., a joint venture between ECD and Intel Corp. Among other honors, he's been named a "Hero of the Planet" by Time magazine.

[Ovshinsky](#):

http://www.mlive.com/rebrandingmichigan/index.ssf/2008/09/lifetime_innovator_stanford_ov.html

4. EU Parliament Eases Road for Hydrogen Cars

The European Parliament took a significant step towards the introduction of hydrogen-powered cars on Europe's roads, calling for common criteria for the environmentally friendly technology. The fruit of a compromise hammered out by the EU member states, passed almost unanimously, is expected to receive the final green light from the 27 nations soon. The agreement "is a big step forward in the introduction of hydrogen vehicles," said European Commission vice-president Guenter Verheugen. The purpose of the proposal is to "lay down harmonized technical provisions for the type-approval of hydrogen-powered vehicles for the first time," the parliament said. Currently there are no uniform requirements for hydrogen vehicles in Europe, posing problems for hydrogen vehicle manufacturers.

[EU](#): <http://www.eubusiness.com/news-eu/1220455921.96>

5. Tackling Emissions Could Boost Company Value

Combating carbon emissions could boost companies' values by up to 80 per cent, according to a new report. The study, commissioned by the Carbon Trust, revealed both that a firm's value could go up if it tackled its emissions while it could put up to two thirds of its value at risk by failing to take steps. The research looked at businesses across six sectors. It was the sector with the most to gain, automotive, which also risked the most by failing to address the issues. Carbon Trust Chief Executive Tom Delay said: "Climate change will cause a revolution in business and our findings should act as a trillion dollar wake up call to the investment and business communities. Companies and investors that prepare now and develop new strategies will reap the commercial rewards of the move to a low carbon economy."

[Carbon](#): http://www.lowcarboneyconomy.com/community_content/_low_carbon_news/2148

6. EPA Tests Hydrogen Fuel Cell Vehicle Under Real World Conditions

U.S. Environmental Protection Agency (EPA) Administrator Stephen L. Johnson recently showcased the fourth generation of Chevrolet's Equinox FCV, the newest addition to the agency's vehicle fleet. The new car underscores EPA's support for national efforts to develop clean energy technologies and help move the U.S. toward energy independence. "EPA is turning the key on an engine of change, by turning fleet emissions from CO₂ to H₂O," said EPA Administrator Stephen L. Johnson. "EPA supports new technologies such as hydrogen fuel cells that are good for our environment and good for our economy." EPA has a six-month lease on the fuel cell vehicle, made possible with a grant provided by U.S. Dept. of Energy (DOE).

[EPA - GM](#):

<http://yosemite.epa.gov/opa/admpress.nsf/0/aaffbaca675bd4a6852574c200532597?OpenDocument>

7. Congressman Norm Dicks Test Drives Honda FCX Clarity

As Congress debated an energy bill that seeks to reduce American dependence on imported oil, Rep. Norm Dicks, D-WA, had the opportunity to experience first-hand technology that uses a zero-emission hydrogen fuel cell in an all-electric car that gets the equivalent of 79 mpg. The Honda FCX Clarity is currently offered for lease in California where hydrogen infrastructure is more developed. Efforts by Honda, General Motors and other auto manufacturers to develop and utilize alternative, U.S.-produced fuels offer a promising glimpse of a future with cleaner automobiles. Washington states residents can look forward to a new sales tax break offered to individuals purchasing alternative fuel vehicles. Effective January 1, 2009, the law covers vehicles running on natural gas, propane, and hydrogen, [Honda](http://www.house.gov/apps/list/speech/wa06_dicks/hondafcx.shtml): http://www.house.gov/apps/list/speech/wa06_dicks/hondafcx.shtml

8. Toyota Begins Leasing FCVs

Toyota Motor Corp. (TMC) has begun leasing its new fuel cell hybrid vehicle model, the "TOYOTA FCHV-adv", to Japan's Ministry of the Environment and plans to lease the new FCHV to other national government entities, local governments and companies in or related to the energy industry. Lease terms are 840,000 yen (including tax) per month for 30 months. By leasing its fuel cell hybrid vehicles, TMC can obtain real-world feedback for further development, including efforts to improve the durability and reduce the cost of its proprietary high-performance polymer electrolyte fuel cell, the Toyota FC Stack. This leasing, as well as TMC's participation in other cooperative efforts with the government, is aimed at helping to bring about the widespread use of fuel cell vehicles. [Toyota](http://www.toyota.co.jp/en/news/08/0829.html): <http://www.toyota.co.jp/en/news/08/0829.html>

9. Ford American Edge SUV: This Hybrid has the Edge

Ford has come up with the first fuel-cell plug-in hybrid based on the American Edge SUV. Its electric "HySeries Drive" is powered by a 336-volt lithium-ion battery, enough for 25 miles of driving before the 40kW "Halo" fuel cell starts up and begins recharging it. Drawing on 4.5 kilograms of compressed hydrogen stored in a carbon-fiber tank, this extends the range to 223 miles with frugal driving pushing that to almost 400 miles. Top speed is 87 mph with fuel consumption equivalent to almost 49 mpg.

[Ford](http://www.telegraph.co.uk/motoring/main.jhtml?xml=/motoring/2008/09/05/mnford105.xml):

<http://www.telegraph.co.uk/motoring/main.jhtml?xml=/motoring/2008/09/05/mnford105.xml>

10. Hyundai Spends Big on Fuel Economy R&D

Hyundai Motor Co. has expanded its global R&D budget, with an emphasis on improving the fuel economy of Hyundai and Kia vehicles. The Korean automaker is developing new small-displacement engines as well as hybrid and fuel-cell vehicles. For 2008, Hyundai Motor has budgeted \$1.87 billion--or about 5.2 per cent of total company spending--on R&D. That is up from \$1.59 billion in 2007. North American R&D spending will be up about 11 per cent this year. Hyundai is also working on fuel cell technology, which may be used for a dedicated platform. Styling for a fuel-cell vehicle may draw from the 2+2 i-Blue crossover concept shown at the 2007 Frankfurt auto show. Hyundai plans to have a running prototype of the fuel cell vehicle by 2010 and begin leasing about 10,000 vehicles annually to consumers by 2012.

[Hyundai](http://reviews.cnet.com/8301-13746_7-10030396-48.html): http://reviews.cnet.com/8301-13746_7-10030396-48.html

11. Nissan Develops World's First SiC Inverter for Use in a Vehicle

Nissan Motor Co., Ltd. recently announced the development of the world's first inverter using Silicon Carbide (SiC) diodes for vehicle use. The company has launched tests using an X-TRAIL FCV equipped with this technology. Inverters on electric-powered vehicles control

the electricity coming from the power source, and their size has often set limitations on vehicle layout. The newly developed inverter uses SiC for the diodes and employs a new Nissan-developed heterojunction diode (HJD) structure. Together the SiC diode and HJD structure reduce the overall size and weight of the inverter and dramatically improve its reliability. At Nissan, the inverter is regarded as one of the key technologies in electric-powered vehicle development along with the motor and the battery.

[Nissan](http://www.compoundsemi.com/documents/view/cldoc.php?id=10751#top): <http://www.compoundsemi.com/documents/view/cldoc.php?id=10751#top>

12. HSU Hydrogen Fueling Station Unveiled

In 2005, a group of Humboldt State University (HSU) students entered the National Hydrogen Student Design Contest with their design of a hydrogen fueling station for hydrogen-powered vehicles. Not only did the HSU students win the contest, they got to see their project come to life with the recent unveiling of the station on Humboldt State University's campus. In September, HSU President Rollin Richmond, U.S. Rep. Mike Thompson, Charlie Fielder of Caltrans, and Peter Lehman of the Schatz Energy Research Center, as well as the students themselves, cut the ribbon to the station and powered the hydrogen-fueled Toyota Prius the university owns.

[HSU](http://eurekareporter.com/article/080904-hydrogen-fueling-station-unveiled-by-research-center): <http://eurekareporter.com/article/080904-hydrogen-fueling-station-unveiled-by-research-center>

13. Linde Group Opens First H2 Filling Station for Fuel Cell Passenger Ships

The Linde Group officially opened the world's first hydrogen filling station for fuel cell passenger ships (Zemships) in Hamburg, Germany. "With this globally unique filling station, we are showing that hydrogen is well-suited as an emissions-free fuel for passenger ships," said Dr. Aldo Belloni, member of the executive board of Linde AG. The first passenger ship for 100 people to be operated via a hydrogen fuel cell will convey passengers on both the Alster as well as the Elbe rivers. For fuelling, liquid hydrogen stored at a temperature of minus 253 degrees C is transformed into hydrogen gas in an evaporator and then compressed up to 450 bar via a two-stage compressor system. The complete fuelling station was designed and built by Linde.

[Linde](http://www.linde.com/international/web/linde/like35lindecom.nsf/0/615A793DD8D90894C12574B400480004):

<http://www.linde.com/international/web/linde/like35lindecom.nsf/0/615A793DD8D90894C12574B400480004>

14. Hydrogenics Awarded Seven Orders for Onsite Hydrogen Generation Units

Hydrogenics Corp., announced it has received orders from customers in Asia, Eastern Europe and South America with an aggregate value of \$6.8 million. The HySTAT hydrogen generation systems will be used to deliver high purity hydrogen onsite for metallurgical processing, glass manufacturing and generator cooling. These orders are anticipated to be delivered within a twelve month period. "A significant factor in capturing these sales was the high quality and strong operating track record for our HySTAT hydrogen generation systems. By using our HySTAT hydrogen generation system, customers can enjoy reliable hydrogen generation, produced on site and on demand," said Daryl Wilson, president and CEO of Hydrogenics Corp.

[Hydrogenics](http://www.hydrogenics.com/ir_newsdetail.asp?RELEASEID=337301): http://www.hydrogenics.com/ir_newsdetail.asp?RELEASEID=337301

15. POSCO Starts 50 MW Clean Energy Power Plant

South Korea's POSCO, the world's No.4 steelmaker, announced it had started operation of the world's biggest fuel cell power plant, as it seeks to diversify into the fast-growing clean energy business. POSCO said it started operating the 50 megawatt (MW) fuel cell power plant in its hometown Pohang, in the country's southeast, through an alliance with U.S. firm FuelCell Energy. The facility, double the size of FuelCell's Connecticut plant, is the world's

biggest and has the capacity to power 17,000 households. POSCO plans to spend \$148 million by 2012 to grow its fuel cell business and build another 50 MW fuel cell power plant.

[POSCO](#):

<http://www.reuters.com/article/rbssIndustryMaterialsUtilitiesNews/idUSSEO13988320080904>

16. Maxwell Tech, Plug Power in Fuel Cell Deal

San Diego-based Maxwell Technologies has signed a deal to supply its Boostcap ultracapacitors to Plug Power. Plug Power makes hydrogen fuel cell-based power systems for electric lift trucks. Plug Power will use the ultracapacitors in its line of GenDrive fuel cell power units. Financial terms of the contract were not disclosed. The ultracapacitors are scheduled to be delivered during the third and fourth quarters. "Integrating Maxwell's ultracapacitors into our fuel cell systems enhances the value of our GenDrive product for our customers," said Andy Marsh, president and CEO of Plug Power. "Ultracapacitors' burst power capabilities for lifting, as well as regenerative braking for energy recuperation and longer operating life, make them an ideal complement to hydrogen fuel cells in this application."

[Maxwell Tech](http://media.cleantech.com/3356/maxwell-tech-plug-power-fuel-cell-deal): <http://media.cleantech.com/3356/maxwell-tech-plug-power-fuel-cell-deal>

17. Steam Heat: Researchers Gear Up For Full-scale Hydrogen Plant

At Idaho National Laboratory, a team of engineers is working to develop a greener process, splitting steam into hydrogen and oxygen using high-temperature electrolysis. Coupled to an advanced nuclear plant, high-temperature electrolysis would use heat and a portion of the plant's electricity to generate hydrogen. The laboratory's High-Temperature Electrolysis team recently completed the first test of its Integrated Laboratory Scale (ILS) experiment, a scaled, high-temperature electrolysis hydrogen plant. When operated at full capacity later this year, the ILS plant will generate roughly 500 grams of hydrogen an hour. The lessons the team learns with the ILS will help them design a full-scale plant capable of producing 2.5 kilograms of hydrogen each second.

[INL](http://www.sciencedaily.com/releases/2008/09/080918170624.htm): <http://www.sciencedaily.com/releases/2008/09/080918170624.htm>

18. BMW Group Presents New Version of its Teaching Material

The topic of developing renewable energy sources is more relevant than ever, especially at schools. The BMW Group picked up on this issue early on and in response to repeated requests from the educational community started providing comprehensive course material back in 2001. BMW's new information packet, "H2 -- Mobility of the Future" presents an updated and reworked version of its course folder on the topic of hydrogen. "H2 -- Mobility of the Future" deals in depth with the many different aspects of "Supplying energy for the future and sustainable mobility." The material, which is available in German and English versions, also provides information on the subjects of "Hydrogen, mobility and energy supply" for the interested public.

[BMW](http://www.fuelcellsworks.com/Supppage9151.html): <http://www.fuelcellsworks.com/Supppage9151.html>

19. China Works with Canada on Hydrogen Fuel Cell Tech

China's Ministry of Science and Technology (MOST) has recently signed a memorandum of understanding (MOU) of four-year validation on technology cooperation with the National Research Council of Canada (NRC). The MOU puts emphasis on the hydrogen fuel cell technology for the two sides at the initial stage of cooperation, and other priority areas will also be explored for other parts that may interest the two sides. A Steering Committee will be founded by MOST and NRC according to the MOU to hold conferences annually on the project of cooperation.

[China-Canada](http://www.huliq.com/3169/68957/china-works-canada-hydrogen-fuel-cell-tech): <http://www.huliq.com/3169/68957/china-works-canada-hydrogen-fuel-cell-tech>

20. Ulster Helping to Make Hydrogen Safe Energy for the Future

University of Ulster, Ireland scientists are working closely with the U.S. Dept. of Energy (DOE) to increase the safety of hydrogen as an alternative fuel. DOE sponsored four delegates to the recent 3rd European Summer School on Hydrogen Safety hosted by the University of Ulster and attended by experts from 26 countries. The drive to introduce hydrogen as a safe and available energy carrier has led to an increased requirement for hydrogen safety education. Ulster is one of the leading organizations in the world in this field, particularly in the area of computer modelling of potential accident scenarios and how they can be mitigated. Computer modelling can, in many instances, replace expensive large-scale experiments.

[Ulster](http://news.ulster.ac.uk/releases/2008/4000.html): <http://news.ulster.ac.uk/releases/2008/4000.html>

21. QuantumSphere Files Key Patent on Technology to Increase Lithium Ion Battery Life

QuantumSphere, Inc. recently announced it has filed a key patent for technology it has developed that extends the capacity of rechargeable lithium ion batteries up to five times. Next-generation batteries featuring this technology could dramatically improve the operating life of portable consumer electronics, hybrid-electric vehicle range, and a wide variety of energy storage applications. This news follows a previous QuantumSphere battery announcement highlighting the development of a high-rate, paper-thin, nano-enabled electrode for disposable batteries. This earlier breakthrough patent pending air-electrode design increased power output by 320 per cent in zinc-air cells, providing roughly four times more power than equivalent sized alkaline batteries, and is expected to be commercialized in 2009.

[QuantumSphere](http://www.qsinano.com/news/releases/2008_09_16.php): http://www.qsinano.com/news/releases/2008_09_16.php

22. U.S. Military Wants Drones in Air for Years

The U.S. Defense Advanced Research Projects Agency announced plans to develop an unmanned aerial vehicle (UAV) called the Vulture which would be able to fly for five years carrying a half-ton of payload and drawing just 5 kilowatts of power. The agency awarded \$4 million design contracts to defense giants Boeing and Lockheed Martin, as well as to Aurora Flight Sciences, a specialty-UAV company. Power is the most critical part of the design, and it would come from one of two technologies: regenerative fuel cells or batteries. In the fuel-cell option, electricity that isn't used to power the airplane and payload during the day is directed to an electrolyzer. The electricity splits the water into hydrogen and oxygen cells, which are stored, then at night they rejoin to become water again, releasing electricity.

[UAV](http://www.suntimes.com/news/nation/1178147,drone092208.article): <http://www.suntimes.com/news/nation/1178147,drone092208.article>

23. Military Energy and Fuels, Oct 23-24

The rising cost of military fuels, coupled with the instability of foreign supplier markets, is driving the U.S. Dept. of Defense to mandate increased efficiencies in fuel use and to develop alternatives to traditional fossil fuels. On October 23-24, 27 leading experts will examine topics such as "Current and Potential Opportunities in Alternative Fuels, Fuel Cells, Platform Electrification and Other Leading-Edge Technologies" at this two-day conference, to be held in Las Vegas, NV. For information or to register, call (310) 563-1223 or check the link below for full details.

[Conference](http://www.ttcus.com/view-conference.cfm?id=81): <http://www.ttcus.com/view-conference.cfm?id=81>

24. California Energy and Air Quality Conference

The California Energy Commission's Public Interest Energy Research (PIER) Program is hosting the California Energy and Air Quality Conference, on October 29-30, 2008 in Diamond Bar, CA. The Energy Commission, California Air Resources Board, South Coast Air Quality Management District, and Bay Area Air Quality Management District are co-sponsors. This two-day event will help to bring public awareness to the current issues and activities underway in the areas of improving air quality and its relation to energy production and use, and spur innovative solutions towards a clean and productive future. The conference is geared towards industry, such as power producers and equipment manufacturers, and mid-level managers of energy and air quality regulatory agencies, including researchers.

Conference: <http://or.ucr.edu/event/index.aspx>

25. Board of Directors; Send Us Your News

We welcome important news from our members for inclusion on our website and in next month's report. Thank you for helping build a great organization. Our board: President - Henry Wedaa; Vice President - Paul Scott, ScD; Secretary - Josh Mauzey; Treasurer - John Williams; Managing Director - Catherine Rips; Membership Chairman - Mark Abramowitz; Program Chairman - Henry Wedaa; Director at Large - Allan Bedwell; Director at Large - Fred Silver; Director at Large - Larry Watkins; Ex-officio Government Liaison - Analisa Bevan. To send news or contact the board, please email: info@californiahydrogen.org.

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Catherine Rips, Editor/Publisher

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