



Intelligent Energy and Suzuki open plant in Yokohama. Pictured from left to right are Hidezumi Kato (General Manager), Phil Caldwell (Board Member and Director of Corporate Development at Intelligent Energy), Osamu Honda (President and Representative Director and Vice President and Representative Director of Suzuki Motor Corp.), Masataka Yamakawa (Vice President and Representative Director of IE Japan Ltd), Ichizo Aoyama (Board Member and Managing Director of Suzuki Motor Corp.), Kunio Nakamura – (Auditor). See story below.

AROUND THE INDUSTRY

Intelligent and Suzuki Establish Production Plant

SMILE FC System Corp., a joint venture between U.K.-based Intelligent Energy and Japan's Suzuki Motor Corp. has successfully established a production plant for its fuel cell systems in Yokohama, Japan.

The production line marks the successful transfer of proven semi-automated production technology, developed and utilized by Intelligent Energy. This represents the next stage in high volume production of fuel cell systems with associated reduction of manufacturing and assembly costs as well as improved cycle times and enhanced product quality.

The manufacturing center will be scaled up to supply

fuel cell stacks for integration with Suzuki vehicles. The joint venture has access to Intelligent Energy's fuel cell technology under a non-exclusive licence, thereby accelerating the commercialization of Suzuki's fuel cell vehicles.

Cummins Invests in ReliOn

Cummins Inc. of Columbus, Indiana, has made a strategic investment in ReliOn of Spokane, Washington. ReliOn provides high reliability fuel cell solutions for backup power and grid-support applications. Cummins designs, manufactures, distributes and services engines and related technologies including fuel systems, controls, air handling, filtration, emission solutions and electrical power generation systems.

"Cummins is a global leader in power generation and will be an excellent partner to work with ReliOn as we continue our global market expansion," says Gary Flood, ReliOn's CEO. "Cummins is committed to assist ReliOn toward increasing our market visibility and access. The company will also use its broad capabilities in engineering and manufacturing to accelerate ReliOn's efforts to drive costs down and increase the distribution of our fuel cell products around the world."

As part of this investment, Cummins will join the ReliOn board of directors.

Former GM Executive Joins CellEra Board

CellEra of Israel, a leading developer of cost-effective Platinum Free Fuel Cell technology, reports that Dr. Alan Taub, professor of Materials Science and Engineering at the University of Michigan and former GM Vice President Global R&D, will be joining its board of directors as an independent industry expert. Taub is a well known authority on vehicle propulsion and electrification. He joined GM as executive director in 2001 and was named vice president in 2009. Taub played a key role in the GM's fuel cell program, among the largest and most advanced in the automotive industry. He is a member of the U.S. National Academy

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of Engineering, and served on the Operating Council for the United States Council for Automotive Research. He also is chair for the Visiting Committee on Advanced Technology (VCAT) for NIST.

"We are delighted to have Dr. Alan Taub join our team" said Ziv Gottesfeld, CEO of CellEra. "His experience in leading present-day fuel cell technology from prototype phase through to millions of miles logged under the hood will be invaluable to us as we continue to advance and commercialize our Platinum Free fuel cell technology."



HySA Launches Solar-to-Hydrogen Pilot Plant

HySA Infrastructure Center of Competence (CoC) in South Africa has received a 400W state of the art solar-to-hydrogen installation from Heliocentris. In addition, the CoC has a Proton OnSite HOGEN-series PEM electrolyser that will be integrated into a 6kW solar-to-hydrogen pilot plant. This large pilot plant is the first of its kind in South Africa and both of these installations will be used for training and education purposes in a variety of hydrogen-related technologies including: fuel cells, energy storage, energy management and batteries.



The Proton OnSite electrolyser is a PEM system, which supports the region's platinum group metals beneficiation strategy by developing technologies linked to the use of local resources.

HySA infrastructure is one of three Centers of Competence setup to develop fuel cells and hydrogen related technologies in South Africa and is co-hosted by North-West University and the Council for Scientific and

Industrial Research. The Infrastructure CoC is led by Dmitri Bessarabov, who has formerly held positions at Ballard and AFCC.

The Forefront of Fuel Cell Technology

United Natural Foods (UNFI) of Providence, Rhode Island, is the U.S.'s largest wholesale distributor of natural, organic and specialty foods and related products. During the past three years, the company examined ways to reduce its energy consumption, leading it to hydrogen fuel cells as an alternative to the lead-acid batteries that traditionally power the company's lift trucks.

UNFI selected Plug Power as the fuel cell manufacturer for the conversion of the lift trucks from the Raymond Corp. at UNFI's Sarasota, Florida, facility. Raymond's research shows that, as a lead-acid battery is used over the course of a shift, the voltage drops and lift truck performance goes down. With hydrogen fuel cells, voltage delivered by the fuel cell remains constant until the fuel is depleted.



Feedback from operators at the UNFI Sarasota facility has been very positive. Mike Garstka, operations manager at UNFI, says operators are seeing 10 to 12 hours of continuous use on the pallet trucks. "That's a significant

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improvement compared with the five to seven hours of use we were seeing with the batteries,” he adds. “Productivity also has increased because of the short time it takes to refuel the lift trucks, compared with changing a battery,” Garstka reports.

Fuel Cell Industrial Floor Cleaning Machine

Nilfisk-Advance’s U.S. president and general manager Jeff Barna recently unveiled the Advance CS7000™ Combination Sweeper-Scrubber Fuel Cell unit at the ProMat 2013 Expo in Chicago. This is the first fuel cell-powered industrial combination sweeper-scrubber and responds to the growing industrial demand for cost-effective, alternative fuel solutions.



Operating solely on hydrogen, the Advance CS7000’s fuel cell is manufactured by Plug Power Inc. of Latham, New York. Featuring dedicated sweeping and scrubbing functions, the Advance CS7000 provides one-pass cleaning power for enhanced cleaning capabilities. Benefits include full operator shift of cleaning time between refuels; rapid refuel capabilities with no recharge cycle to enable 24/7 operation; and simple, two-connection setup for easy fuel cell installation.

The design of Advance’s CS7000 series has resulted in up to a 50% reduction in fuel costs relative to comparable models in the marketplace, reduces up to 45% of the LPG fuel consumption and cost, produces up to 45% less CO₂ emissions than other LPG fueled units, increases battery runtime vs. competitors by 64% and is 100% indoor emission-free ePower battery operation.

Rocket Engine Maker Commissions Fuel Cell

Pratt & Whitney Rocketdyne (PWR), a rocket engine maker based in California, celebrated another milestone

in its effort to conserve energy and reduce waste with the commissioning of United Technology Corp.’s first operational large (400kW) fuel cell in the San Fernando Valley. About 35 people attended the January 9 event at



PWR’s headquarters in Canoga Park, including Los Angeles City County Councilman Dennis Zine and representatives from California state assemblyman Bob Blumenfield’s office; the Los Angeles Department of Water and Power; and Southern California Gas Co.

The PureCell system is about the size of a school bus, and is supplying power to the grid at the company’s De Soto Avenue campus. The PWR fuel cell cost about \$3 million installed and qualifies for incentives under the State’s Self Generation Incentive Program, as well as the federal investment tax credit which, when combined, can reduce the project cost by up to 60%.

Ballard Announces Additional SDTC Funding

Ballard Power Systems of Vancouver, Canada, has been awarded approximately CAN\$2.0 million in funding from Sustainable Development Technology Canada (SDTC) for a one-year extension to a project that is furthering commercialization of the company’s fuel cell power module for use in the transit bus market.

In January 2010, SDTC awarded Ballard up to CAN\$4.8 million for a development project under which Ballard has now completed the design, testing and implementation of new sub-systems for its FCvelocity™-HD6 power module. The project has improved durability and reliability of the power module as well as reducing its cost.

Many of these design improvements were successfully implemented into the BC Transit fuel cell hybrid bus fleet in Whistler, British Columbia, leading to improved overall performance. As a testament to its operation, Whistler’s 20-bus fleet has surpassed the 1.7 million mile (threshold for revenue service to that community), since entering service in early-2010.

FUEL CELL PATENTS

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RESEARCH AND DEVELOPMENT

Producing Hydrogen from Wet Biomass

The European research project SusFuelCat aims to improve the process of extracting hydrogen from wet biomass. Prof. Dr. Bastian Etzold, junior professor for Catalytic Materials at the Excellence Cluster Engineering of Advanced Materials at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), is responsible for initiating and co-ordinating the international project. The European Union will fund SusFuelCat from 2013 for a period of four years with €3.5 million.

At the moment, hydrogen can only be extracted from biomass (compostable material) using large amounts of energy. For example, wet biomass must be dried intensively before it can be processed. For SusFuelCat, researchers are using Aqueous Phase Reforming (APR) as an alternative to the drying process. In this method, the wet biomass comes into contact with a catalyst. The chemical reactions break down the material and release almost pure hydrogen.

The key to making the process more efficient are the catalysts. If the researchers can optimise the catalysts, they can increase the sustainability of the entire process.

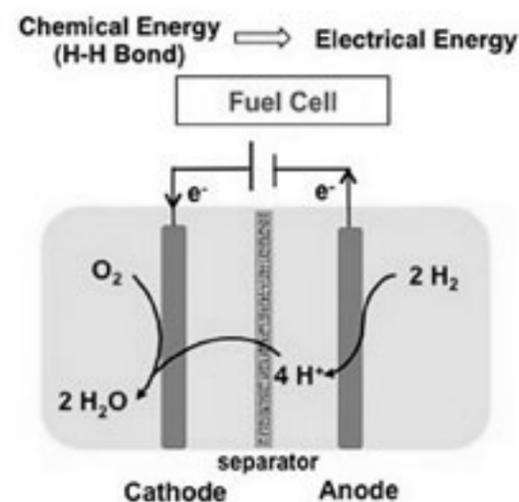
Catalysts used at the moment contain expensive precious metals such as platinum and palladium which are finely distributed on ceramic plates. The SusFuelCat project aims



to reduce the amount of precious metals or replace them with other metals without affecting the efficiency of the APR process. Carbon-based materials such as nano tubes or activated carbon could be used as carriers as they promise long-term stability and environmentally-friendly recycling of the metals.

Iron-Based Catalyst Developed for Fuel Cell

Scientists at the Pacific Northwest National Laboratory have developed the first iron-based catalyst that can convert



hydrogen directly to electricity for more affordable fuel cells.

“A drawback with today’s fuel cells is that the platinum

they use is more than a thousand times more expensive than iron,” said chemist R. Morris Bullock, who lead the research. Bullock’s team at the Center for Molecular Electrocatalysis has been developing catalysts that use cheaper metals such as nickel and iron. Along with chemists Tianbiao Liu and Dan DuBois, Bullock developed their catalyst based on the molecule hydrogenase which uses iron to split hydrogen.

In order to get the results they wanted, the catalyst has to be able to split the hydrogen atom into all of its parts. One hydrogen molecule is made up of two protons and two electrons and the catalyst would need to separate the protons, sending it away to be caught by a molecule called a proton acceptor. In a fuel cell, this acceptor would be oxygen. The team determined the shape and size of the catalyst and also tested different proton acceptors. With iron in the middle, arms hanging like pendants around the edges, draw out the protons.

With the design down, the team then measures how fast the catalyst could split molecular hydrogen. Their best time was about two molecules per second, thousands of times faster than the closest, non-electricity making iron-based competitor. The catalyst could also efficiently produce energy at around 160 to 220mV, similar in efficiency to most commercially available catalysts.

Making Hydrogen Using Artificial Leaves

Scientists at the University of East Anglia in the U.K. are beginning a project to make hydrogen by copying the photosynthesis process used by leaves. Lead researcher Professor Julea Butt, from UEA’s School of Chemistry and School of Biological Sciences, explained that the system will involve placing tiny solar panels on microbes. These will harness sunlight and drive the production of hydrogen, from which the technologies to release energy on demand are well-advanced. “We imagine that our photocatalysts will prove versatile and that with slight modification they will be able to harness solar energy for the manufacture of carbon-based fuels, drugs and fine chemicals.”

The research will be undertaken with colleagues from the University of Leeds and the University of Cambridge. It is funded by the Biotechnology & Biological Sciences Research Council (BBSRC).

The BBSRC’s strategy is currently to promote the commercialization of biorenewables technologies, which include using plants, bacteria, algae and fungi as non-fossil sources of energy. The Council already funds research into making biofuels such as miscanthus and willow more stress resistant.

PRODUCT NEWS

Fuel Cell-Powered H-ROVER

Users control the H-ROVER via their smartphone, tablet or PC, viewing a real-time video feed from its LED-equipped Bluetooth video camera. Instead of conventional batteries, the vehicle comes with two of



Horizon's HYDROSTIK PRO hydrogen gas-absorbing metal hydride cartridges – these are in turn refilled using the included HYDROFILL PRO desktop hydrogen station, which extracts hydrogen from water stored in an integrated reservoir.

For more information, visit www.horizonfuelcell.com.

PowerTREKK Charger to Be Released in Spring

The PowerTREKK phone charger is slated to finally come to the U.S. at the end of this quarter.



To use the \$229 PowerTREKK, you also have to purchase a \$4 PowerTREKK Pukk. Once you add a small amount of water (about half a shot), and add a one-time-use Pukk, the latter will immediately begin separating the hydrogen from the water, using it as fuel to charge your handset.

Each Pukk will produce 2.5W at 5V, which is good for about one full iPhone charge. If there is electricity available, however, you can also charge the separate internal battery in the PowerTREKK so it can power your phone later on.

For more information, visit www.powertrekk.com.

UPCOMING EVENTS

Meetings and Symposia

February 27-March 1 – Battery Japan 2012, 4th International Rechargeable Battery Expo, Tokyo Big Sight, Tokyo, Japan.

Includes battery materials/components, rechargeable batteries, equipment for R&D and manufacturing rechargeable batteries and capacitors.

Info: Visit www.batteryjapan.jp/en/

March 10-15 – Internal Battery Association Conference, Hotel Catalonia Rambia, Barcelona, Spain.

Offers a blend of battery science and technology and serves as a specialized forum for the discussion of interdisciplinary battery research and development.

Info: Visit www.icmab.csic.es/iba2013/.

March 11-14 – 30th International Battery Seminar & Exhibit, Broward County Convention Center, Ft. Lauderdale, Florida.

Ideal for battery and small fuel cell manufacturers, users, OEMs, product designers, component, equipment and material suppliers, applications engineers, marketing analysts, patent attorneys, investors and those interested in the battery and small fuel cell industries.

Info: Thomas M. Devita, Seminar Coordinator, Florida Educational Seminars Inc., 2300 Glades Road, Suite 260W, Boca Raton, FL 33431, phone: (561) 367-0193, fax: (561) 367-8429, or visit www.powersources.net.

April 15-16 – Battery Congress 2013, MSU Management Education Center, Troy, Michigan.

Provides a forum for engineers, manager, scientists, academic researchers, and industry to exchange advances in battery technology and applications management systems. Dedicated to the research integration of new batteries into vehicles and other energy systems.

Info: Visit <http://batterycongress.org>.

April 16-18 – FDFC2013: 5th International Conference on Fundamentals and Development of Fuel Cells, Kongresszentrum, Karlsruhe, Germany.

Focuses on fuel cells and electrolyzers. Includes advances in materials, single cells, stacks and system development, as well as patent issues such as fuel cell

diagnosis, power processing and control, characterization of MEA upon operation/aging.

Info: Visit <http://fdfc2013.eifer.uni-karlsruhe.de>.

April 30-May 1 – Next Generation Batteries 2013, Venue Hilton Boston Back Bay, Boston, Massachusetts.

Breakthroughs in new battery chemistries, electrode and electrolyte materials paved the road for a market with unlimited potential. Will Li-ions deliver the power, energy, cost and safety in commercially available systems? Or is the future somewhere beyond lithium-based chemistries? A panel of experts in battery materials, systems design and integration, manufacturing and commercial applications examine emerging issues underlining this pivotal time in the industry.

Info: The Knowledge Foundation 2193 Commonwealth Ave. #398, Boston, MA 02135-3853, phone: (617) 232-7400 Fax: (617) 232-9171, or visit: www.knowledgefoundation.com.

May 6-8 – Battcon, Disney's Contemporary Resort, Lake Buena Vista, Florida.

Noncommercial, technical event for storage battery users from the power, telecom, UPS and other industries. End-users, engineers, battery and battery test equipment manufacturers, installers, and standards and safety experts gather to discuss storage battery innovations and solutions for existing systems; everyday applications; technical advances; and industry concerns. A trade show features storage power related vendors.

Info: Jennifer Stryker, Albercorp, 3103 N. Andrews Ave. Ext., Pompano Beach, FL 33064, (954) 623-6660 ext 23806, or visit www.battcon.com.

May 29-30 – 3rd Israeli Power Sources, Batteries, Fuel Cells, Smart-Grid & EV Conference, Daniel Hotel, Herzelia, Israel.

Brings together participants from leading private and public companies, start-ups, investors, academics and businesses to discuss batteries, fuel cells, power sources, smart-grid and EVs.

Info: Visit <http://www.sdle.co.il>.

June 10-12 – Electric Drive Transportation Association Conference and Annual Meeting, Washington Marriott Wardman Park, Washington, DC.

Provides in-depth, leading-edge information to promote the discussion and development of electric drive technology and power sustainable transportation. Includes electric, extended range electric, plug-in hybrids, hybrids and fuel cell vehicles. Ideal for academic, government, and industry leaders interested in the technical, policy and market challenges. Hundreds of exhibits are anticipated. Ride, drive and charge the latest battery, plug-in hybrid, and fuel cell electric drive vehicles, bikes and scooters.

Info: Visit www.electricdrive.org.

June 26-27 – IFFB: The International Flow Battery Forum, Venue TBA, Dublin, Ireland.

Promotes the latest developments in flow battery science, technology, and deployment; and flow batteries as

a modern and effective electrical energy source.

Info: Visit www.flowbatteryforum.com.

July 12-15 – Hydrogen and Fuel Cells Conference 2013, Silverado Resort and Spa, Napa Valley, California.

Includes hydrogen production and materials; materials for hydrogen storage; fuel cell research and development; hydrogen and fuel cell applications; and hydrogen safety engineering.

Info: Visit <http://www.zingconferences.com/index.cfm?page=conference&intConferenceID=109&fSignup=1&CFID=2267227&CFTOKEN=97972260>.

September 1-4 – 4th International Microbial Fuel Cell Conference, Cairns, Queensland, Australia.

Organized by Pennsylvania State University (USA), Gwangju Institute of Science and Technology (Korea), and Wageningen University/WETSUS (The Netherlands) and includes all microbial electrochemical technologies.

Info: Visit www.mfc4.com.au.

September 10-13 – 15th Asian Battery Conference, Shangri-La Hotel, Singapore, China.

Industry C-Level executives, marketers, technical staff and sales teams discuss new and emerging technologies, understand future directions, meet new suppliers, conduct business and network with industry peers.

Info: Visit www.conferenceworks.com/au/15abc/.

November 17-20 – EVS27, Venue TBA, Barcelona, Spain.

Includes planetary sessions, oral sessions in parallels, poster sessions, exhibition, Ride&Drive, and projects dissemination. See the latest battery, hybrid and fuel cell electric vehicles available on the market, prototypes and infrastructures for the electric vehicles as well as all types of components.

Info: Visit www.evs27.org.

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