



The first fuel cell vehicle rolls off Hyundai's assembly line. (See story below.)

AROUND THE INDUSTRY

Hyundai Begins Assembly Line Production of ix35

A white Hyundai Motor Co. ix35 fuel cell vehicle rolled off the assembly line at the company's Ulsan, Japan manufacturing complex on March 4, as Hyundai became the world's first car manufacturer to begin assembly-line production of zero-emissions, hydrogen-powered vehicles for fleet use.

The ix35, based on Hyundai's popular ix35 SUV, exited the assembly line at Hyundai Motor's Plant No. 5 during a launch event attended by Hyundai management and VIPs.

The ix35 Fuel Cell unveiled at the ceremony will be one of 17 destined for fleet customers in City of Copenhagen, Denmark and Skåne, Sweden. The Municipality of Copenhagen, as part of its initiative to be carbon-free by 2025, will be supplied with 15 ix35's for fleet use. Two ix35 vehicles will be supplied to Skåne, Sweden.

Protonex to Accelerate Growth in Military Power

Protonex Technology Corp. of Southborough, Massachusetts, has announced the closing of a credit facility to support the explosive growth of its alternative

energy products within the U.S. and allied militaries. WindSail Capital Group LLC has provided a \$2 million credit facility, which will be used for working capital and sales channel expansion.

Protonex' intelligent portable power solutions, like the Squad Power Manager (SPM) and Squad Portable Battery Charger / APU (M300), have been enthusiastically accepted by the U.S. Department of Defense because they reduce weight, improve power reliability and minimize energy costs. By making solar and fuel cell energy usage easy, flexible and inexpensive, the products enable a significant reduction in energy resupply, saving dollars and lives.

These lightweight power solutions have transitioned from field testing to full production and deployment, as sales to the U.S. Army, Navy, Air Force, and Special Operations have accelerated. The products have been used in combat operations over the past three years and proven capable of improving mission effectiveness while saving significantly on battery logistic requirements.

FuelCell Energy Tests Technology at Landfill

Valuable gas is continually being generated by landfills around the world, and Danbury, Connecticut-based FuelCell Energy believes that its technology can be used to prevent it from going to waste. The company has entered a contract to demonstrate a tri-generation fuel cell power plant near Vancouver, British Columbia (B.C), utilizing landfill gas as the fuel source. It is the company's first opportunity to demonstrate application of its Direct FuelCell technology, which produces hydrogen for sale after the electrochemical process.

Quadrogen Power Systems will refine the landfill gas before it is used to generate multiple revenue streams, including electricity, heat and renewable hydrogen, hence the tri-generation descriptor.

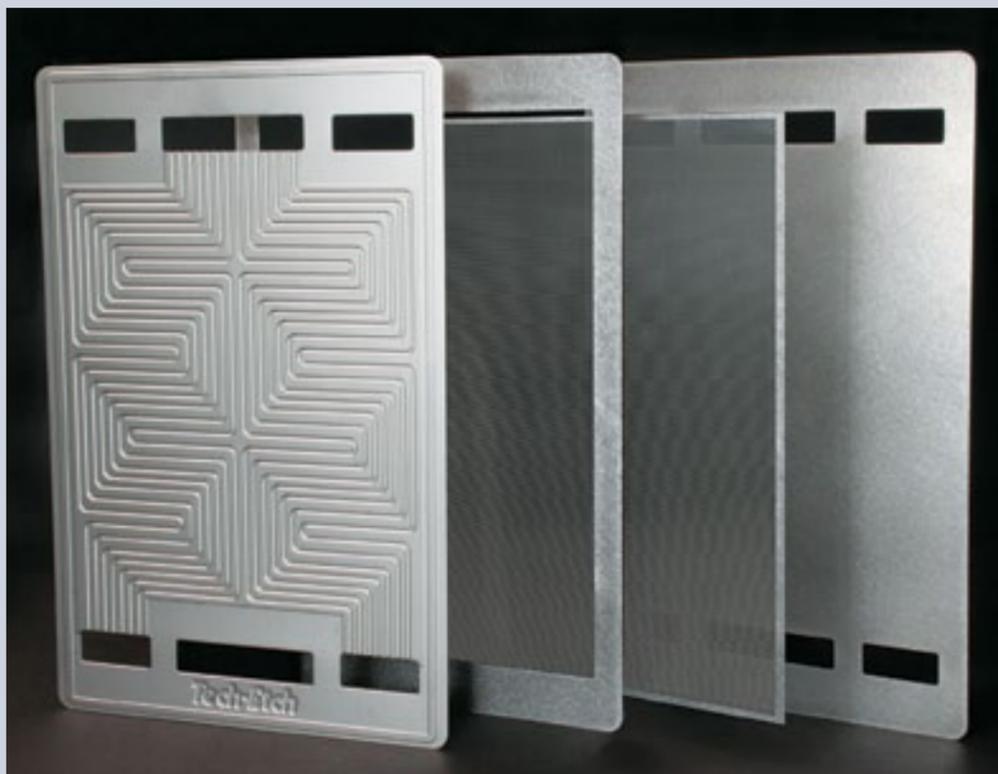
The heat, in the form of hot water, will be supplied to Village Farms, a hydroponic greenhouse business that operates a 110-acre greenhouse at the site in Delta, B.C. Renewable hydrogen will also be exported for vehicle

Etched Metal Fuel Cell Bipolar Flow Field Plates, Frames, Membrane Support Screens & End Caps

Photoetching metal offers fuel cell designers unique time-saving and cost advantages. Rapid prototyping is automatic, plus only a new phototool is required for design changes.

Photoetched **Stainless Steel** and **Titanium** components are ideal for the fuel cell stack.

- Bipolar Flow Field Plates
- Frames
- Membrane Support Screens
- End Caps



Etched Titanium Fuel Cell Components Stack Up The Best

Due to their robustness and improved volumetric power density when compared to graphite, extremely corrosion resistant **Stainless Steel** and **Titanium** bipolar flow field plates for PEM fuel cells offer many advantages:

- Where space is limited, they are thinner producing a shorter stack.
- Metals offer superior electrical and heat conductivity than non-metal solutions.
- For mobile applications, metal plates are less fragile and able to withstand mechanical impact.
- For long-life applications, stainless steel and titanium provide extended life times plus improved electrical performance.

Scan for additional information on etched fuel cell stack components.



Photoetching advantages:

- No expensive tooling or time consuming mold making required.
- Thickness is typically .050" or less.
- Multiple channel levels can be etched onto the fuel cell plate.
- Concept to part in only 3 weeks.
- Smooth surfaces are burr and stress free.
- Prototype to high volume.

Conductive Coating Process

Robotic spray coating process applies conductive coatings to improve electrical contact between active materials and to provide oxidation and corrosion protection.



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fueling or industrial applications. Power production is expected to commence in early 2014.

ACAL Appoints New Chief Executive

U.K.-based ACAL Energy, which owns the technology enabling the world's first low-cost, high-performance hydrogen fuel cells, has appointed Greg McCray to be its new chief executive. McCray will lead the company through its next round of funding and product trials with partners in the automotive and stationary power industries.

McCray was previously CEO of Antenova Ltd., a global wireless components company. Before joining Antenova, he was CEO and chairman of PipingHot Networks, a U.K. broadband start-up name-checked by the Wall Street Journal on its Capital Envy List of high-potential companies.

His main role at ACAL Energy will be to begin the mass-market deployment of ACAL Energy's new fuel cell technology, via licensing agreements with the automotive industry. McCray is currently on the board of directors for America's third-largest network operator, CenturyLink Inc.

In other news, ACAL Energy is celebrating 8,000 hours of continuous use with no degradation. The company has developed a novel technology that cuts costs and boosts the durability of hydrogen fuel cells by replacing the fixed platinum catalysts on the cathode of a PEM fuel cells with a liquid regenerating catalyst system.



that cause degradation with a 25% cost saving due to the reduced need for platinum.

By using a liquid system and carrying out the oxygen side of the reaction outside of the fuel cell stack the system, the company has managed to address the durability problems caused by unwanted oxidation reactions occurring in the cell, degradation of the membrane through repeated drying and degradation of the catalyst.

The system is also far simpler than most PEM fuel cells requiring no air compressor or humidity control and the liquid catalyst is able to act as a coolant reducing volume and cost.

Proton Power Acquires SPower GmbH

Proton Power Systems plc of Puchheim, Germany, a leading designer, developer and producer of hydrogen fuel cells and hydrogen fuel cell electric hybrid systems, has signed an agreement to acquire Germany-based SPower Holding GmbH with its subsidiary SPower GmbH for a nominal amount of €5. Proton Power will then merge SPower with its subsidiary Proton Motor Fuel Cell GmbH. The business division will continue to operate under the name Proton Motor Fuel Cell GmbH. SPower's products will be sold under a product line called SPower within Proton Motor.

Established in 2007, SPower serves IT, Telecoms, public infrastructure and healthcare customers in Germany, Europe and Middle East with power supply solutions for DC and AC power demand.

Serving the Fuel Cell Industry Since 1996,

ADVANCED FUEL CELL TECHNOLOGY (FCT) is published monthly by Seven Mountains Scientific Inc., P.O. Box 650, 913 Tressler St., Boalsburg, PA 16827, USA; Phone: 1-814-466-6559, Fax: 1-814-466-2777, Visit: www.7ms.com

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Annual print subscription rates include First Class or Air Mail postage. USA, Canada and Mexico: US\$120; All Other Countries: US\$155. Online also available. Pay by MasterCard, Visa, American Express, or check negotiable with a U.S. bank to: Seven Mountains Scientific Inc.

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PEM fuel cells degrade by approximately 28mV per 1,000 hours – a key barrier to their widespread adoption. However, ACAL's FlowCath system bypasses the issues

SPower will be completely integrated into the Proton Motor division. Sales, after sales service and logistics, will be strengthened. Cross selling synergies will be optimized with products from Proton Motor being offered to the existing SPower customers.

U.S. Navy to Demonstrate Regenerative Fuel Cell

The US Naval Air Warfare Center Weapons Division (NAWCWD) Renewable Energy Office is set to test its new trailer-mounted regenerative fuel cell system in a



lab at China Lake, California, prior to field testing with troops. NAWCWD Renewable Energy Office electronics engineer Matt Malone says that the new fuel cells can be towed to remote locations to produce energy using water and sunlight. Designed to be deployed anywhere, the new environmentally friendly renewable energy system features recyclable fuel cell and an array of solar panels. It is capable of generating around 5,000W of electricity.

An operator will have to initially feed the system with water followed by pointing the solar arrays towards the sun to generate electricity. This is then run through the water to produce hydrogen and oxygen. The recyclable fuel cells generate energy through electrolysis by using hydrogen in water as fuel. The stored hydrogen is again used at night to generate electricity, while the extra solar energy left during after powering a command center would be put into use to create hydrogen.

AFC Energy Extends Electrode Life

AFC Energy reports that it has extended the longevity of its electrodes to more than six months of continuous operation at its laboratory in Dunsfold, Surrey, U.K. The milestone was achieved for the first time in late January

using a generation of electrodes developed a year ago.

AFC Energy has identified that the first industrial applications require a minimum of three months' electrode life to be economic, particularly in South Korea. At six months longevity, these applications have the potential to generate significant revenues for AFC Energy while also opening up new commercial opportunities in Germany, where the company is carrying out long term longevity trials with Akzo Nobel.

Electrodes are the critical components of a fuel cell which enable the electrochemical reactions to occur between hydrogen and oxygen (from air) to generate electricity, heat and water. Laboratory trials of electrodes are on-going.

Fuel Cell Hybrid Trucks Rolling Into Houston

Thanks to funding from the U.S. DOE and some committed regional stakeholders that include Houston Galveston Area Council, Total Transportation Services, Inc., Air Products, Vision Industries, and EDF, 20 diesel-powered heavy duty trucks will be replaced with zero-emission TYRANO™ hydrogen fuel cell-electric trucks. The DOE granted HGAC \$3.4 million in funding to launch a zero emission engine technology demonstration project – the largest of its kind- at the Port of Houston Authority, where heavy duty trucks are projected to account for almost half of all port emissions by 2015.



Expected emission reductions from the project include 39 tons of nitrogen oxides and 0.8 tons of particulate matter per year. This award is timely as the Houston area is on the verge of a non-attainment designation with the newly strengthened particulate matter standard and still struggles to meet the national ambient air quality standard for ozone.

EPS Expands to the U.S., Partnering with VP Energy

Electro Power Systems SpA of Aosta, Italy, a leading energy storage company, has entered into an exclusive manufacturing, operations and distribution agreement for the U.S., Canada and Mexico with VP Energy LLC of Brighton, Michigan.

A large green banner advertisement for the 2013 EDTA Conference & Annual Meeting. The background shows a night view of the U.S. Capitol building. The text "Unleash the Power" is written in large white letters. Below the text are three icons: a plug with a lightning bolt (labeled "HYBRID"), a hand plugging a cord (labeled "PLUG-IN"), and a fuel pump nozzle (labeled "FUEL CELL").

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The decision to partner with an alternative energy solutions provider was fueled by the increasing use of EPS's autonomous, self-recharging fuel cell technology to provide clean and efficient energy storage, including grids and renewables extension and optimization worldwide. With its comprehensive coverage of the territory and expertise in supplying and integrating the Premier UPS Fuel Cell Generators to North America, VP Energy can effectively expand the use of CSA-certified ElectroSelftm, the world's only stand-alone, self-recharging energy storage system based on fuel cell technology. VP Energy is also well-positioned to integrate EPS technology within comprehensive energy storage and mission-critical support solutions.

Target Investing in Fuel Cells

Target Stores of Minneapolis, Minnesota, reports that two of their stores – one in San Francisco and one in Pasadena, California – are currently piloting the new onsite power source from Bloom Energy, fuel cells. The pilot is part of a larger effort to incorporate onsite energy-generating technology at Target locations that includes rooftop solar panels.



“A typical Target store has energy needs during the day that can be significantly met by solar energy produced by solar panels on the roof,” explains Dave Hughes, group manager of Target's energy and carbon management team. “If we were to combine daytime solar generation with fuel cell energy powering the store's additional energy needs, we'd approach a facility that runs on 100% self-generated power.”

If these first fuel cell pilots are successful, the team will look to expand the pilot to stores on the East Coast, particularly those prone to power outages.

Tanaka Constructs Dedicated Fuel Cell Plant

Tanaka Holdings Co. Ltd. of Tokyo, Japan, reports that Tanaka Kikinzoku Kogyo K.K. of Tanaka Precious Metals, which boasts the world's leading share in fuel cell catalysts, will construct a dedicated plant for fuel cell catalysts within the premises of the Shonan Plant.

With an investment of approximately ¥1 billion, a dedicated plant with total floor space of 1,000 square meters within the Shonan Plant is newly established. Currently, the merging and relocation of the fuel cell catalyst R&D, product inspection and shipment functions from the Hiratsuka Technical Center as well as the manufacturing functions in the Shonan Plant to the dedicated plant is underway.



The dedicated plant is scheduled to be in full operation in October. In the dedicated plant, the polymer electrolyte membrane fuel cells used in fuel cell vehicles and distributed cogeneration power supplies such as ENE-FARM household fuel cells will be developed and manufactured.

Amplats Eyes Fuel Cell Home Generator

South Africa-based Anglo American Platinum (Amplats) is to invest US\$4million in Canadian company Ballard to support projects to commercialize platinum-based fuel cell products, in particular the development of a prototype home generator with the potential to provide economical electric power to remote rural African households.

Ballard said that Amplats' interest in the growth of fuel cell market adoption “extends beyond the implications for platinum utilization to the potential transformational impact fuel cells could have on the economy in South Africa.”

Aimed at addressing the needs of households in remote rural communities not connected to a power grid, the home generator will be built with Ballard fuel cells and run on readily available methanol fuel, using an integrated fuel reformer.

FUEL CELL PATENTS

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Official Gazette, Vol 1386 (January 2013)

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RESEARCH AND DEVELOPMENT

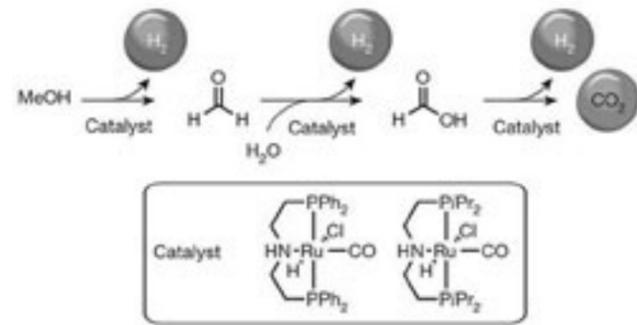
Supercharging Methanol for Fuel Cells

Scientists in Germany and Italy have discovered a way to derive hydrogen gas from methanol at low temperatures and pressures using soluble ruthenium-based pincer catalysts. The finding may open the way to using methanol as a hydrogen carrier for PEM fuel cells in vehicles.

“Ideally we would like a liquid energy carrier, so it is of interest to use methanol as a carrier for hydrogen if we can do the conversion efficiently,” says Matthias Beller of the University of Rostock, Germany, who led the research.

The team developed a range of soluble catalysts in which a central ruthenium is clamped by a nitrogen and two phosphorus, themselves attached to organic groups. In the presence of water and sodium hydroxide, the catalyst accelerates the conversion of methanol to formaldehyde, releasing hydrogen. The formaldehyde is then itself further

transformed to formic acid, again with hydrogen being produced, and this in turn is split into hydrogen and carbon dioxide. Unusually, therefore, the single catalyst reacts with three different substrates as the reaction proceeds, and for each molecule of methanol consumed, three of hydrogen are liberated. Crucially, the reaction runs at temperatures below 100°C and at ambient pressure, making it feasible to incorporate into a practical fuel cell system, says Beller.



Valerie Dupont of the University of Leeds, U.K., who researches hydrogen production by advanced steam reforming processes, says, "They have achieved a difficult thing to do, but until there is a significant reduction in the cost of producing methanol in the first place then this may remain a niche application."

Unlocking Fuel Cell Conductivity

Work on a high-conductivity material is demonstrating the role of oxygen ions in enhancing their capabilities. Yttria stabilized zirconia, also known as YSZ, is a material of great interest because of its relatively high oxygen-ion based conductivity. In particular, it finds applications in electrochemical devices, such as solid oxide fuel cells and oxygen sensors. In a study published in *The European Physical Journal B*, Kia Ngai, from the University of Pisa in Italy, and colleagues from the Complutense University in Madrid, Spain, devised a model of the oxygen-ion dynamics that contribute to the conductivity of YSZ.

Fuel cells currently operate above 700°C, which strongly limits their use. Experiments show that ionic conductivity in YSZ requires an activation energy that is much higher than that supplied by computer simulations describing independent ion hopping. Relying on the CM model, the authors first established a quantitative description of the ion dynamics in YSZ. Then they compared the predictions of the CM with experimental results and simulations, particularly those of nanometric-scale thin films, published in the last 10 years.

Thus, in their model, they established the connection between the level of the energy barrier for independent ion-hopping simulations and the level of activation energy measured experimentally for long-range movement of oxygen ions. In addition, they attributed an increase of the conductivity in nanometers-thick YSZ films to a decrease in the ion-ion correlations. This model could also be used to study the conductivity relaxation of so-called molten, glassy and crystalline ionic conductors and ambient temperature ionic liquids.

ELECTRIC VEHICLES

Fuel Cell to be Featured at Fleet Show

Fleet operators will be able to experience hydrogen fuel cell driving at this year's U.K. Fleet News Company Car in Action, the industry's biggest event where vehicle manufacturers demonstrate their latest products to more than 1,000 key company car decision-makers.

The brainchild of Professor John Jostins, also managing director of Microcab, the H2EV will provide fleet operators with what is likely to be their first opportunity to drive a hydrogen fuel-celled vehicle.

Microcab will provide a vehicle to drive and a static display at the event, which this year celebrates its 21st birthday, at Millbrook Proving Ground from June 11-12.



Experts from Coventry University, a Microcab shareholder and where Professor Jostins is based, and the University of Birmingham, whose scientists have also worked closely on the project particularly during its driving trials, will be on hand to answer questions.

Alliance to Speed Fuel-Cell Development

Ford Motor Co. is joining with Daimler and Renault-Nissan to speed development of cars that run on hydrogen,

with hopes of bringing a vehicle to market in as little as four years. Under the alliance, each company will invest equally in the technology. They plan to develop a common fuel cell system that the companies will use to power their own vehicles. The companies also plan to take advantage of their combined size to reduce costs.

The companies said engineering work on the individual fuel cells and the overall hydrogen system will be done jointly by the companies at several locations around the world. Work will be done at the site of a previous fuel-cell joint venture between Ford and Daimler in Vancouver, Canada, as well as at a Daimler facility in Nabern, Germany, and a Nissan operation in Oppama, Japan.

They also are studying joint development of other parts for fuel cell vehicles in an effort to bring down costs. The automakers each have several years of experience developing fuel cell vehicles. Their test vehicles have traveled more than 6.2 million miles.

AC Transit Gets CA's Highest Environmental Award

For its innovative fuel cell and solar energy projects, AC Transit has been given the Governor's Environmental and Economic Leadership Award (GEELA), the highest



environmental honor in the state of California. Governor Jerry Brown honored AC Transit as one of 17 organizations that have adopted clean-air business principles and policies that conserve energy, reduce costs and help to improve the environmental health of their surrounding neighborhoods.

AC Transit was honored for building the most comprehensive hydrogen fuel cell demonstration program in the country. Its zero-emission fuel cell buses emit only water vapor from their tailpipes, operate quietly and smoothly, achieve nearly double the fuel economy of conventional buses, and to date have saved more than 68,000 gallons of diesel fuel. AC Transit has also built the most advanced hydrogen fueling stations in the world, featuring the use of solar energy to produce a share of the hydrogen it uses to propel its buses.

In addition, the agency is installing a 400kW SOFC system manufactured in California.

Fuel Cell Golf Cart Unveiled in South Africa

Researchers in South Africa have fitted a hydrogen fuel cell system to a battery-electric golf cart, doubling the range of the vehicle in a first-of-its-kind project in the country.



A team at the University of Western Cape's dedicated hydrogen systems center have been testing the efficiency of the fuel cell cart to see if it performs better than the campus's current fleet of diesel and battery-electric vehicles. Professor Bruno G Pollet and team at Western Cape's Hydrogen South Africa (HySA) Systems Competence Centre said the addition of the fuel cell to the cart saw its range double as well as it reaching a top speed of 30mph.

They will assess the efficiency, performance, and cost competitiveness of the modified cart in a project backed by South Africa's Department of Science and Technology.

Zero Emissions Hydrogen Car Unveiled

A University of Alberta group has a single-seat hydrogen cell car that will compete against teams in the Shell Eco-marathon challenge in Houston, Texas, in April. Mechanical engineering student Matt Sponiar established the team in 2010 to build a sustainable automobile. The group made a debut at the Shell Eco-marathon last year, competing against 150 universities and high schools, taking second place in the Urban Concept Vehicle category. This year, Sponiar said his team wants to maintain that top three tier status.

"At the Shell Eco-marathon we are hoping for a top three finish," he told *redOrbit*. "We have worked hard to improve the powertrain of the vehicle from last year's



Mechanical engineering (Co-op) student and Eco-Car team founder Matt Sponiar (front left) and the Eco-Car team unveiled their vehicle.

car and hopefully this will provide us with the improved performance we are looking for. The body has also been changed to be much more aerodynamic. While we are moving at fairly low speeds, this won't be major, but still an improvement."

Toyota Industries Builds Fuel-Cell Forklift

Toyota Industries Co. is offering a next-generation forklift equipped with a fuel-cell system jointly developed with Toyota Motor Corp. The new vehicle is powered by electricity produced through a chemical reaction between hydrogen and oxygen in the air. Its only exhaust is water. No carbon dioxide is emitted during operation. And after being filled with hydrogen, a process that takes only three minutes or so, the forklift can run for eight hours straight.

Two units have been in trial operation at a Toyota Gosei Co. plant in Japan since December. The plan is to confirm the energy savings by March 2014.

The forklifts are expected to be commercially available from 2015.



PRODUCT NEWS

Off-Grid Base Station Market Gains Traction

According to a new report from Pike Research, *Off-Grid Power for Mobile Base Stations*, annual deployments of off-grid power supplies, using renewable or alternative energy sources, for remote mobile base stations will grow from fewer than 13,000 worldwide in 2012 to more than 84,000 in 2020. In all, more than 390,000 off-grid base stations for mobile telecommunications which use renewable, battery, and fuel cell technologies will be deployed from 2012 through 2020, the study concludes.

Included in the report are a detailed analysis of the technology readiness and an overview of the most likely technology combinations, including renewable generation with fuel cells and batteries, standalone fuel cells, and renewable generation with backup batteries. Market forecasts are provided for revenue, number of deployments, and capacity in megawatts, under base and optimistic scenarios, through 2020.

To download a free executive summary, visit www.pikeresearch.com/research/off-grid-power-for-mobile-base-stations.

Fuel Cell Vehicles & Hydrogen Infrastructure Report

Research and Markets reports the addition of the *The Fuel Cell Vehicles and Hydrogen Infrastructure Report* report to their offering.

Several research FCVs have been developed during the last 20 years with a number of demonstration fleets deployed on the world's roads. These R&D programs and trials have assisted OEMs in achieving substantial reductions in costs and improvements in performance, reliability and durability, to the point where several OEMs have made a commitment to launch commercial FCV production in 2015.

This report examines the market drivers and barriers affecting the emerging FCV market and reviews recent market forecasts. It also presents the various enabling technologies that are contributing to FCV development and provides an overview of the wide range of FCV concepts and prototypes that have been developed and trialed.

Visit www.researchandmarkets.com.

Ecolite-H2 Fuel Cell-Powered Lighting Tower

Youngman Group and TCP have jointly launched a new lighting tower powered by a fuel cell, using hydrogen as the fuel and with no noise or damaging emissions. The Ecolite-H2 is powered by a BOC Hymera fuel cell, which

has been commercially available for more than a year and a half. The fuel cell develops up to 150W of energy. The hydrogen fuel containers can be delivered anywhere in the U.K. within 24 to 48 hours.

The unit was unveiled on the first day of the Executive Hire Show, where the unit was fitted with three small hydrogen canisters inside the canopy, for demonstration purposes. For longer operation, larger, externally sited canisters will be required.

For more information, download the Ecolite-H2 flyer at www.youngmangroup.com/wp-content/uploads/Ecolite-H2_Flyer_Jan-13_LoRes.pdf.

Commercial Fuel Cell Charger Runs on Water

The myFC PowerTrek is one of the world's first portable fuel cell chargers for commercial use. Made by Swedish fuel cell pioneers myFC, it runs on ordinary water. Users simply insert the PowerTrek puck and add ordinary water to provide instant power on the go.



Billions of people worldwide lack connection to the electricity grid from time to time. This applies for daily mobile phone users all over the world, as well as people in emerging markets and outdoor enthusiasts. With the launch of the first ever water based fuel cell charger for commercial use, there is now a clean energy solution when in need of a portable source of power. myFC PowerTrek is both a portable battery pack and fuel cell, intended for people who spend time away from the electricity grid. myFC PowerTrek provides instant power anywhere to electronic equipment such mobile phones cell phones, GPS-devices and cameras.

For more information, visit www.myfuelcell.se.

DOE Hydrogen and Fuel Cells Program Report

The U.S. Department of Energy (DOE) Hydrogen

and Fuel Cells Program reports on activities and progress in its recently published *2012 Annual Progress Report*. This document contains individual reports from projects funded by the program, summarizing the innovative work of scientists, engineers, and other experts from industry, academia, and national laboratories.

The DOE Hydrogen and Fuel Cells Program addresses the challenges facing the commercialization of hydrogen and fuel cell technologies through efforts in basic and applied research, technology development and demonstration, and other supporting activities. The program integrates hydrogen and fuel cell-related activities across the offices of Energy Efficiency and Renewable Energy, Fossil Energy, Nuclear Energy, and Science.

To read this free report, visit www.hydrogen.energy.gov/annual_progress12.html.

UPCOMING EVENTS

Meetings and Symposia

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 – IFBF: 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.

Advanced Fuel Cell Technology

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JES will continue to accept full length manuscripts at a new website: ecs-journals.msubmit.net. Current lag time of 36 days to first review.

ECS Electrochemistry Letters (EEL)

EEL will accept short manuscripts requiring rapid publication at ecs-journals.msubmit.net. Lag time of 16 days to first review, based on current ECS standards for rapid publication journals.

(EEL and *ECS Solid State Letters* will replace the current rapid publication title, *Electrochemical and Solid-State Letters*.)

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SSL will accept short manuscripts requiring rapid publication at ecs-journals.msubmit.net. Lag time of 16 days to first review, based on current ECS standard for rapid publication journals.

(SSL and *ECS Electrochemistry Letters* will replace the current rapid-publication title, *Electrochemical and Solid-State Letters*.)

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New materials for solid oxide fuel cells



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