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Going Green Aloft

Green was the order of the day at June's Paris Air Show, where the traditional oneupmanship got a new twist with camelina jet fuels (a little at a time), hybrid concepts, and even some all-electric airplanes.

Roundup on Page 9

Bio-boosted Boeing 747-8F lands in Paris



Smaller, Thus Bigger

Westport, Long a Leader with Partner Cummins in Heavy NGVs, Stakes Out Position in Small Engines, Most Recently Via GM Pact Westport Innovations (Toronto:WPT), the acknowledged leader with joint venture partner Cummins in large engines for heavy duty natural gas vehicles, is hedging its bets, staking out a position in smaller engines, most recently via a technology development pact with General Motors.

Westport acquired OMVL last year and in the past weeks moved to buy Italy's Emer SpA (F&F, June 13), posing a direct to the OEM suppliers Landi Renzo, Fuel Systems Solutions, Inc. with its Impco Automotive unit, and Clean Energy Fuels-BAF Technologies.

A New Michigan Facility Too

GM and Westport "will bring their extensive expertise to develop natural gas engine controls, emissions and performance strategies."

"This technology offers the promises of a cleaner, lower cost fuel and reduced carbon footprint, while advancing the use of domestic energy," Westport light duty division president Ian Scott said in a release. The GM agreement "demonstrates Westport's success as an advanced technology partner to global automotive manufacturers," Scott said, terming the OMVL and Emer buys "an integral part of our strategy to provide partners, such as GM, with the most advanced integrated solutions." Westport has a new Tech Center in Farmington Hills, Mich., currently staffed by approximately 15

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Late Breaking – Quantum PHEVs for FP&L...

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Many More Ryder CNG Rentals

Nearly half a dozen operators are leasing natural gas trucks from Ryder. At least one of them, Golden Eagle, is outside the initial Southern California/Sanbag grant area.

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Biodiesel May Make Up for Cellulosic

The U.S. EPA has dramatically lowered its expectations for cellulosic ethanol in 2012, creating opportunity for biodiesel under the RFS2 requirement. **Page 5**

E-Power for Pikes Peak

Four- and two-wheelers prove the fastest EVs at the 89th annual Pikes Peak International Hill Climb.

An inductive motor by AC Propulsion powered Yokohama's winning entry and a permanent-magnet motor by UQM drove Skip Yates's record-setting battery motorcycle.

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Natural Gas Vehicles

Westport and GM *(continued)*

people, with expansion plans. John Lapetz, Ford and Clean Vehicle Vehicle Education Foundation veteran, is Westport's light duty division managing director for North America vehicles.

Lapetz notes that the industry is consolidating. Clean Energy, Landi Renzo and FSSI have made major acquisitions in recent years.

"Westport's looking to position itself to be one of the surviving players," he told *F&F* last week.

"Hybridization, lower-displacement with turbo charging, direct injection and other fuel-saving technologies now being applied to gasoline and diesel engines, can also be applied to natural gas fueled engines for even greater improvements in efficiency and fuel cost savings," Lapetz says in the GM announcement.

Integration of new technologies for conventional engines into NGVs is a key challenge facing NGV designers, GM gaseous fuels engineering manager Dick Kauling said at this past April's SAE World Congress in Detroit (*F&F*, April 25).

Westport is tweaking its branding too, keeping the Juniper badge for its existing light duty engines for forklifts and other industrial applications (available in both natural gas and propane versions), and empha-



Westport's Juniper 2.4L

sizing the Westport identity for its newer light duty road vehicle segment.

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This Ain't No Ponzi

Shale Gas Boosters Fire Back at New York Times After Articles Say Claims for Methane Overblown The *New York Times* raised the ire of shale gas advocates as investigative pieces citing named and many unnamed sources, questioned the potential of shale gas as a large-scale contributor to a cleaner and more secure American energy mix.

An **article** by Ian Urbina cited e-mails and other documents indicating that in addition to environmental impacts, shale gas wells are not producing as has been hoped. Urbina reported that well informed, senior people have likened shale gas to a Ponzi scheme.

In a **subsequent article**, Urbina wrote, "One official says the shale industry may be 'set up for failure.' 'It is quite likely that many of these companies will go bankrupt,' a senior adviser to the Energy Information Administration administrator predicts. Several officials echo concerns raised during previous bubbles, in housing and in technology stocks, for example, that ended in a bust." The articles concede that shale gas technology has evolved considerably since some of the doubts were expressed.

They prompted strong **reaction**.

"This particular *NYT* reporter has apparently sought out a few of the doubters to fashion together a negative view of the U.S. natural gas industry," Aubrey McClendon, founder and CEO of Chesapeake Energy, says on a company **Facebook page**.

"This reporter's claim of impending scarcity of natural gas supply contradicts the facts and the scientific extrapolation of those facts by the most sophisticated reservoir engineers and geoscientists in the world," McClendon said. "It is also ludicrous to allege that shale gas wells are underperforming as we sit awash in natural gas, with natural gas prices less than half of what they averaged in 2008... CHK and other shale gas producers are routinely beating our production forecasts..."

"This reality of generations' worth of natural gas abundance is also supported by virtually every credible third-party expert."

"The U.S. natural gas supply growth revolution," McClendon said, "is changing the future of our nation for the better in multiple areas."



Aubrey McClendon

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Natural Gas Vehicles

Cow Product, Cow Power

42-Truck Indiana Over-the-Road CNG Fleet Will Haul Milk Using Biomethane from Cows

A long-awaited, DoE ARRA-backed project using Indiana dairy-derived biomethane to fuel over-the-road trucks hauling milk – 90 million gallons per year – has come to fruition. Kenworth is providing Cummins Westport-powered trucks and Clean Energy Fuels is building two compressed natural gas fueling stations.

“The manure from about 10,000 cows goes into the digester that supplies the biogas for the CNG project,” says Mark Stoermann, Fair Oaks Dairy project boss.

Fair Oaks’ Renewable Dairy Fuels affiliate has contracted with Clean Energy for the two CNG stations supporting 42 Class 8 Kenworth T440 trucks. The trucks are being supplied by Indiana’s Palmer Leasing and will be operated by Ruan Transportation Management Systems.

Agility Taps Quantum and Lincoln

Slated to begin operating in the second half of 2011, the CNG fleet will transport 53 loads of milk per day, each comprising 6,000 gallons, equaling some 7.5 million gallons per month or 90 million gallons milk per year. The trucks will operate between Fair Oaks, Ind. – about 70 miles south of Chicago – and milk processing plants in Indianapolis, Murphysboro, Tenn., and Winchester, Ky. They will replace diesel trucks, and are projected to use more than 1.5 million DGEs (diesel gallon equivalents) of CNG per year.

The trucks will have 8.9-liter ISL G engines from Cummins Westport and CNG tank arrays from Agility Fuel Systems. Agility is using Type IV cylinders from Quantum and Lincoln Composites. Rail-mounted Quantum tanks (via a \$434,000 contract) on each side hold 40 DGEs each, and two back-of-cab Lincolns hold 50 DGEs for a per-truck total of 130 DGEs.

Biogas from an anaerobic digester will be purified using Flotech Greenlane water-scrubbing technology, says Bernie Sheff, president of UTS Residual Processing, which is engineering the system. “We’re sitting in the middle,” Sheff says, with responsibility for technology integration – seeing to it that the gas from the digester gets cleaned to vehicle and pipeline injection standards.

Gas for the Grid, from the Grid, ‘Doing the Right Thing’

The first Clean Energy CNG station will be located near the dairy adjacent to Interstate 65 in Fair Oaks. A second is planned for late 2011 in southern Indiana near the Kentucky border, also on I-65. There will be gas enough from the cows to supply both, although the second station will be supplied on an offset basis, as it will draw methane from the grid.

In addition to effectively supplying both stations, there will be enough gas for a 1-megawatt GE Jenbacher generator making electricity for cleaning and compressing equipment.

Both of the new Clean Energy CNG stations will be public access. “We are delighted to have this opportunity to work with Fair Oaks as they move to control fuel costs in a volatile energy environment, reduce dependence on foreign oil and curb the global warming impact of their fleet operations,” Clean Energy’s Jim Harger said in a release.

“This is a major undertaking that would not have happened without the support of Governor Mitch Daniels; the State of Indiana; the U.S. Department of Energy; Ruan; New Frontier Holdings, our lead investor; and our renewable energy vendor, UTS,” said Mike McCloskey of Fair Oaks Farms. “The many companies involved are all committed to renewable energy, sustainable processes, and doing the right thing. We are excited to be part of providing a model of innovation that can be reproduced in other parts the country in the future.”

The program encompasses two American Recovery and Reinvestment Act projects, says Fair Oaks’ Stoermann. The U.S. DoE’s State Energy Program is anteing \$2 million for extended-range CNG tanks, he says, while DoE Clean Cities Program and the Indiana Office of Energy Development are contributing \$750,000 for the Fair Oaks CNG station.

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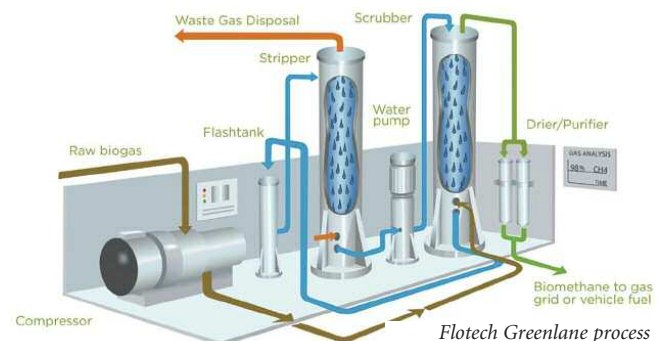
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Natural Gas Vehicles

Ryder Names Fleet Customers

Ryder System, which has pioneered heavy duty natural gas vehicle leasing through the state- and federal-backed San Bernardino Associated Governments project in Southern California, has named nearly half a dozen NGV customers.

They include Tucson, Ariz.-based Golden Eagle, which is leasing 22 compressed natural gas vehicles outside the purview of the \$38.7 million, 202-vehicle Sanbag program.

Ryder took delivery of 70 vehicles in May and is expected to have the balance of the full 202-unit Sanbag order in its fleet by the end of 2011. The order consists of 182 Freightliner and 20 Peterbilt trucks (*F&F*, May 9). Counting Golden Eagle, Ryder says, 87 have been leased.

“There is a pent-up demand for cleaner, more environmentally friendly vehicles at an attractive overall cost, says Ryder west region sales VP Alex Madrinkian.

National Interest

He told *F&F* that fleets as far away as Hawaii are interested in leasing compressed natural gas trucks. “They’re looking for providers,” he says.

The first of the announced lessees was Dean Foods, for five CNG trucks. They were delivered to Dean’s Alta Dena Dairy unit in Southern California in early June, Ryder says. “Dean Foods constantly looks for ways to reduce costs and drive efficiency,” said Pacific Coast group VP Tom Murray, indicating in a Ryder release that the CNG trucks fit the bill.

Mohawk Industries, a large-scale flooring supplier, has leased five liquefied natural gas tractors for Southern California. They are to be delivered this month.

“The timing was right,” said Mohawk transportation director Stan Brooks. And the LNG trucks fit well with aggressive recycling initiatives at Mohawk.

CEVA, the former TNT, promotes sustainable supply chain. It is leasing two LNG trucks, also for Southern California. Procurement VP Jim Krepp said they’ll bring “tangible, sustained benefits” to customers. He told *F&F* he

Sturman Claims Efficiency ‘Breakthrough’

Colorado’s Sturman Industries is claiming significant efficiency gains for large natural gas engines via “a fully flexible electro-hydraulic valve train (‘camless’) design” developed with the support of the California Energy Commission’s PIER program.

Sturman says it has seen peak efficiencies exceeding 40% and fuel consumption reductions as great as 18% using a 15-liter spark-ignition Cummins ISX engine demonstrator. The camless engine is said to combine the benefits of lean-burn and stoichiometric engines.

“Stoichiometric engines have very low emissions by way of a three-way catalyst, but suffer from lower efficiencies in particular at part load,” Sturman business development boss Miguel Raimao says in a release. “Lean-burn engines deliver good fuel economy by running unthrottled, but they require very expensive aftertreatment to meet emission requirements.

“It was clear we had to combine the best attributes of each approach, so we chose to apply our Hydraulic Valve Actuation system to eliminate the throttling losses, with a

CNG-fueled Daimler Freightliner M2 for Dean-Alta Dena



expects the LNG trucks to be cost-neutral, with cheaper fuel offsetting higher fixed and running expenses.

For Golden Eagle, the announced volume leader among the lessees, “This initial order is a first step in converting our entire fleet to natural gas,” said senior operations VP Bill Osteen. CNG, after study “made the most sense,” he said. “Not only is it a cleaner fuel, but we also expect to see real fuel cost savings over time.”

In Tucson, Golden Eagle won’t be able to use the two fueling stations Ryder is planning for the Sanbag project. Public fueling is a possibility for the 22 CNG trucks, all of which are to be delivered by year-end – or the firm may invest in infrastructure, an assistant to Osteen told *F&F*.

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simple three-way catalyst to clean up remaining emissions.”

In addition to HVA, a proprietary “STEC” (Sturman total engine controller) manages the engine’s stock turbo-charging and EGR systems, the company says, allowing compression ratio to be raised from the typical 10:1 to 14:1.

“This technology is a solution for California’s interest to utilize biomethane,” said Sturman government affairs director Joe Vollmer. “This engine can respond to the varying qualities of renewable natural gas produced at a landfill, and then efficiently generate electricity on the spot.” A simple software change can allow the same engine to meet the demands of vehicle and stationary applications, Sturman says. Vollmer told *F&F* that Sturman is eyeing a sparkless design that would maintain the fundamental efficiency of the diesel-cycle/ compression-ignition engine while running solely on natural gas.

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Biofuels

Volume Rebates from Propel

Hard-charging Propel Fuels is launching a Volume Rebate Program for renewable ethanol and biodiesel it says is the first in the nation, with VRP-enrolled fleets earning tiered rebates for monthly purchases of 500 gallons or more.

“Our rebate program provides fleets with all the benefits of using renewable fuels, without sacrificing perks they may have only seen from petroleum-based fuel retailers in the past,” Propel CEO Matt Horton said in a release.

“Many other fuel rebate programs have such high monthly volume requirements that small to mid-sized fleets can’t take advantage of the savings,” Horton said.

“We designed this program to benefit a wide range of fleet sizes, reward our current consumers, and incentivize new fleets to help free us from foreign oil by choosing renewable fuels.”

VRP is available to users of Propel’s CleanDrive Fleet Card. Propel has partnered with fleet management and transaction processing specialist **Wright Express** to implement the program.



Propel opened at a 76 station in Norwalk, Calif. this past Thursday

VRP offers a rebate of 5¢ per gallon for monthly purchases of 1,000 gallons or more and 3¢ per gallon for monthly purchases of 500 to 999 gallons. The rebate will be automatically calculated by Wright Express and applied to customers’ billing statements at the end of each monthly billing cycle, Propel says. Enrolled fleets are not committed to purchasing a minimum amount of fuel from Propel, and purchases of both biodiesel and E85-ethanol flex-fuel will be applied to monthly volumes.



Also available is the proprietary CleanDrive integrated carbon emission reduction tracking platform, likewise termed a national first, that tracks and displays the carbon emission reductions from the use of renewable fuels purchased at Propel stations.

“CleanDrive graphically displays the positive impacts of renewable fuel use,” Propel says, including reductions in carbon dioxide emissions, barrels of oil displaced, and reductions in foreign oil consumed. “The system tracks fuel usage across Propel’s network of fueling stations,” Propel says, “enabling businesses and government fleets to easily quantify the positive impacts of their decision to use low-carbon fuels, and in some cases meet mandated or voluntary fleet emission reduction goals.”

Propel, which was founded in Seattle and is now headquartered in Redwood City, Calif., offers E85-ethanol and B5 (with some B20) biodiesel – alt fuels for which substantial numbers of alt fuel vehicles exist today. The firm says it’s watching the gaseous fuels propane and natural gas, but that markets are currently too small.

Using a combination of grants and private investment, Propel is building a network of fueling stations, usually hosted by namebrand gasoline retailers including Chevron, Valero and 76, with a target of 75 station in California alone in the coming year.

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Picking Up the Slack

Biodiesel producers stand ready to meet the U.S. EPA’s RFS2 (renewable fuel standard) requirements this year after the agency dramatically lowered its expectations for cellulosic ethanol, says the National Biodiesel Board.

Despite new products and processes aimed at facilitating production of ethanol from non-food sources, “the production isn’t there,” says one close observer.

Conversely, “The diversity of our feedstocks gives us flexibility and strength,” says Ben Evans, NBB’s new, Washington-based federal communications director.

In 2009, EPA proposed cellulosic ethanol production of 500 million gallons for 2012.

Last month, the federal agency **proposed** no more than 12.9 million gallons of cellulosic for 2012 and perhaps as little as 3.45 million gallons.

But EPA still wants to see 2 billion gallons of “advanced biofuels” next year. “There is a big opportunity

for biodiesel to make up the difference,” says one **analysis**.

“We’ve had several months of record or near-record production,” Evans told *F&F*. “We are confident we can meet the production goals that are laid out in the RFS program.”

U.S. biodiesel output for the first nine months of 2011 total 298 million gallons, he says, as compared with 315 million gallons for the whole of 2010. There were 82 million gallons produced in May alone, indicating that the pace is quickening.

“The market is definitely responding and the fuel is moving,” Evans says.

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Florida Power & Light is a high-volume biodiesel user, for both straight diesels and hybrids

Biodiesel

Isuzu Blesses B20

The National Biodiesel Board helped spread the word late last month about Isuzu's approval of B20 for its new diesel trucks, including N-Series and new Isuzu Reach models. "This is especially significant as Isuzu Commercial Truck is the first Asian manufacturer to approve B20 for U.S. market spec engines," NBB said.

Customers "have been asking for approval to use B20 in our products in the U.S. for many years," Isuzu commercial truck retail marketing manager Brian Tabel says in an NBB release. "We are really happy to now turn that request into a reality." The "assurances" afforded by ASTM spec D7467 contributed to Isuzu's decision, NBB said.

Isuzu earlier this year made its gasoline-fueled Gas NPR available with a gaseous-prep package to facilitate conversion to propane or natural gas (*F&F*, March 28).

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IFT Additive for Brazil and Beyond

International Fuel Technology reports a purchase order from Petrobras to supply its PerfoLiFT BD-4 additive for three biodiesel manufacturing plants in Brazil, "which collectively produce over 150 million liters of biodiesel per year" – some 40 million gallons.

PerfoLiFT BD-4 provides "superior oxidation stability and deposit formation control in biodiesel fuel blends," the St. Louis-based firm says.

Such additives are important as biodiesel comes to be made from diverse feedstocks, IFT notes, claiming that its "PerfoLiFT BD-Series has the potential to additize all biodiesel productions around the globe."

The firm has formulations to improve the cold-weather performance of biodiesel too, and offers its DiesoLiFT additives for enhancing the fuel efficiency of diesel engines.

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CE Pathways Biodiesel for Dorly

Dothan, Ala.-based Clean Energy Pathways reports an agreement to supply 40,000 barrels (1,680,000 gallons) of high purity, ASTM-grade biodiesel to Calverton, Md.-based Dorly Petroleum, pending final price negotiation.

CE Pathways says it will supply B99.9-grade biodiesel to be "combined with petroleum fuels by Dorly to yield the required final blends."

"Dorly is one of several fuel distributors we have diligently cultivated as potential long-term customers for large monthly supplies of ASTM-grade biodiesel," CE Pathways president and CEO Greg Clemons said in a release.

"The signed letter of intent is a positive indicator as we advance through the final price negotiation phase."

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Fleets Tweets

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Hybrid & Electric Vehicles

Quantum PHEVs for Florida

Quantum Fuel Systems (NASDAQ:QTWW) has reported an \$8.65 million purchase contract from Florida Power & Light, received on April 19, for its new Ford F150-based plug-in hybrid electric vehicle.

"The first two customers have purchased more than \$14 million worth of vehicles," Quantum president and CEO Alan Niedzwiecki told *F&F* Friday – the earlier being Dow Chemical, parent of lithium battery supplier Dow Kokam (*F&F*, May 30).

Dow is to take 100 of the F-150 PHEVs by the end of 2012. FP&L could with options take more than 200, Niedzwiecki says. A firm order for ten has been placed, says FP&L's George Survant.

The Quantum PHEV uses Dow Kokam's NMC (for nickel manganese cobalt) lithium ion battery technology in a 20-kilowatt-hour custom pack said to deliver an optimal combination of power and energy. "Ideal for fleet vehicle driving characteristics, the F-150 PHEV has a 35 mile electric-only range, shifting to hybrid electric mode thereafter for a total range of over 400 miles," Quantum says.

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FedEx Express Adding eCells and eStars

FedEx Express said last week that it's adding more than 4,000 new, fuel efficient vehicles to its fleet, among them two dozen battery electrics. The firm is bringing new EVs to New York City, Chicago and Memphis, and "diversifying the existing Los Angeles fleet."

FedEx will add 15 Navistar eStar EVs, two Freightliner Custom Chassis Corporation eCell EVs, two FCCC electric vehicle retrofits, "and five Ford Transit Connect Electric vans to complement the current 19 all-electric vehicles deployed in Los Angeles, London and Paris."

24 EVs, 45 Hybrids, 4,000 BlueTec Diesels

FedEx is also adding 45 of FCCC's new Eaton-drive hybrid electric pickup and delivery vehicles in Los Angeles.

"On high-mileage routes, FedEx is upgrading vehicles with 4,000 fuel efficient, lower emitting BlueTec clean diesel Sprinter Vans. Each Sprinter is at least 100% more fuel efficient than the most commonly found alternative it replaces," FedEx Express global vehicles asset management chief Keshav Sondhi said in a release. "Since launching our first Sprinter in 2000, we have put close to 1.4 billion miles on these more fuel efficient vehicles, saving over 66 million gallons of fuel compared to their predecessors."

"The key is to use the right truck for the mission on the right route," Sondhi said.

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Electric Vehicles

Better Place Charges Forges Ahead

Better Place has opened its first battery switch station in Denmark, where it plans to have 20 within the next nine months. “We have overcome the last barrier to the electric car’s commercial breakthrough: range,” Better Place Denmark CEO Johnny Hansen said in a release. “Based on the interest we have received so far, I expect this to be the top selling car in Denmark in just a few years.”

Better Place advocates pure EVs with batteries that can be quickly swapped out: depleted batteries are replaced with charged ones in minutes rather than the hours required to charge (*F&F Strategies*, September 6, 2010).

“Switchable battery technology completely offsets the range limitation of traditional EVs,” Better Place says.

A key partner is Renault, which offers its Fluence Z.E. battery sedan with QuickDrop switchable battery.

Taxi Trials in San Francisco

An agreement with Renault targeting commercial launch next year in Australia was announced last month.

In Israel, home of Better Place founder Shai Agassi, a battery switch technology demonstration center, opened in January, drew more than 60,000 visitors through March.

Fluence Z.E. sedans are being deployed there too.

Four-year-old Better Place hopes by this time next year to have two switch stations in the San Francisco Bay Area – in the Fisherman’s Wharf area of San Francisco and in downtown San Jose – to be followed by San Francisco and San Jose airport locations in late 2013.

The firm plans to deploy six battery EVs modified for battery switching as phase one in the San Francisco area, with about 60 vehicles deployed, mostly as taxis, by late 2013. “We’re looking at U.S. vendors for the vehicles,” says California business development director Vandana Bali.

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Denmark Climate Minister Lykke Friis cuts ribbon as Better Place celebrates the opening of Europe’s first electric vehicle battery switch facility in Gladsaxe, outside Copenhagen. A total of 20 are planned for Denmark over the next nine months. Looking on are Better Place Denmark CEO Johnny Hansen (striped tie) and Renault Nordic CEO Philippe Jombart. A Renault Fluence Z.E., available with a ‘QuickDrop’ switchable battery, may be seen at left.

EVs Climb Fastest

Four- and two-wheel battery electric vehicles proved to be the fastest and second-fastest at the 89th Pikes Peak International Hill Climb on June 26.

AC Propulsion spread the word June 27 that it supplied a proprietary electric drive for the Yokohama Rubber-sponsored (and Yokohama BluEarth-tired) electric race car that took the Climb’s Exhibition Class title – setting a new EV record with a time of 12:20:084, besting last year’s record-breaking time by nearly a minute. AC devised a special cooling system for the vehicle’s 200-kilowatt induction motor, a high-performance version of the firm’s AC-150. The car, built by Summit Motorsports and driven by Japan’s Ikuo Hanawa, had a battery pack using 6,656 of Sanyo Electric’s 18650-size cylindrical lithium ion cells.



UQM Technologies

(AMEX:UQM) provided the drive for the second-fastest vehicle, the Swigz.com Pro Racing team’s electric motorcycle, which notched a time of 12:50.094. The bike had a

UQM PowerPhase 145 system with an upgraded inverter to allow 180 kilowatts and 550 Nm peak output.

Rider Chip Yates told *F&F* that he built the lithium ion battery back using 102 pouch cells yielding 31 amp-hours. He says he had 14.4 amp-hours left at the summit.

AC Propulsion, president Tom Gage, 909-592-5399;

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Sanyo USA, Mike Meckl, 248-489-9019, ext 228

or (communications) Aaron Fowles, 619-661-4151;

afowles@sna.sanyo.com; us.sanyo.com

UQM, Andrew Roberts,

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Swigz Pro Racing, Chip Yates, racing@swigz.com; chipyates.com

New Fujitsu Microcontrollers

Fujitsu Semiconductor America launched a series of 32-bit microcontrollers its says “combine excellent performance with a wide range of peripheral functions to enable optimal, high-speed and highly efficient 3-phase inverter motor control” in electric and hybrid electric vehicles.

“This level of integration and performance enables system designers to reduce overall motor and motor-control unit costs significantly,” FSA says.

“The MB91580 series is an ideal design choice for electric and hybrid vehicles because it is designed specifically to support motor control requirements,” FSA senior marketing manager Akio Nezu said in a release last week.

“These microcontrollers use a dedicated embedded resolver sensor interface to control the three-phase inverter, resulting in optimal motor controllability. This enables the system designer to achieve higher performance while lowering the system cost,” Nezu said.

The new microcontrollers, available now, come in 144-pin quad flat packages. Sample pricing starts at \$25.

Fujitsu (U.S. sales), Robert Bandemir, 770-329-6468;

robert.bandemir@us.fujitsu.com or 800-866-8608;

fsa_inquiry@us.fujitsu.com; www.fujitsu.com

Electric Vehicles

Cruise Car Is Cruising

Florida's Cruise Car is promoting its low-speed battery electric vehicles – the “All American” series – built as a quiet and environmentally positive alternative to fuel vehicles with recycled materials content and, on many of some two dozen models, solar panels that can enable as much as ten miles per day, “off-grid.”

The firm has devised proprietary leasing programs to allow tax-exempt non-profits and government agencies to take advantage of solar tax credits and rebates to lower their transportation costs.



A new “E-Monitor” brand metering system allows users “to measure their reduction in carbon footprint and to monitor the actual electric use during travel, battery charge level and solar photovoltaic panel output.”

‘The Time and ROI Is Now’

“No vehicle is more energy-efficient than our All American Series,” Cruise Car president Ken Chester said in a recent release. “With onboard solar panels and over 60% recycled parts they are also the most eco-friendly vehicles in the world. And because our All Americans are made totally in the USA, they also create jobs here.

“When you combine the solar tax grants available for the remainder of 2011 and tax credits available through 2016 with our Cruise Car leasing programs, the time and [return on investment] is now for fleet operators to explore the conversion of their low speed passenger and light utility vehicles to solar electric.”

Cruise Car reports new deals with Tampa Electric and Hertz. Fleet users (as provided by Cruise Car) include

U.S. Air Force	Jefferson Patterson Park and Museum (Maryland)
U.S. Coast Guard	Desoto Juvenile Facility
U.S. Navy	TSA Miami
Anne Arundel Community College	IMG Academies
Tuckers Point Bermuda	U.S. Bureau of Reclamation
Hildene-Lincoln Family Home	Armed Forces Retirement Homes
Polk County	Cap Juluca Hotel/Resort
Amgen Pharmaceutical	Pelican Bay
San Juan National Historic Site	Department of Veteran Affairs
Marriott-Clearwater	Ritz Carlton St. Thomas
Naval Health Clinic	LongBoat Key Club
Turks & Caicos Resorts	Muhlenberg College
Cleveland Zoological Society	

Cruise Car (sales), Adam Sulimirski,
941-929-1630; mobile 941-993-3490;
adams@cruiseincar.com; www.cruiseincar.com



Cruise Car vehicles ready for shipment to the U.S. Navy in San Diego

Events

Plug-In 2011 in Raleigh

July 18-21, Plug-In 2011. Raleigh Convention Center in Raleigh (Research Triangle), N.C.

Plug-In 2011, Mindy Berman, 310-915-5947;
fax 310-737-9260; mindy@mfbccommunications.com;
www.plugin2011.com

Green Drive Expo in Madison

July 23-24, Green Drive Expo at the Dane County Fair at the Alliant Energy Center in Madison, Wisc.

Green Drive Expo, Eric Powers, 608-729-4082;
info@greendriveexpo.com; www.greendriveexpo.com

IQPC EVs in Los Angeles

July 25-27, 2nd Electric Vehicles Summit. Millennium Biltmore Hotel in Los Angeles. Organized by IQPC.

IQPC New York, Samara Chughtai or Ms Manjula Dharia,
toll-free 800-882-8684 or 212-885-7800; info@iqpc.com;
www.electricvehiclesummit.com

FedFleet 2011 in Orlando

July 26-28, FedFleet 2011, the 11th National Motor Vehicle and Aviation Workshops and Exposition. Rosen Shingle Creek in Orlando, Fla. Hosted by the Federal Fleet Policy Council, the U.S. General Services Administration and GSA Fleet, and the Interagency Committee for Aviation Policy.

Organized by A-S-K Associates.

A-S-K, Danielle Garcia, 785-841-8194
or toll-free 800-315-4333, ext 215; fax 785-841-2668;
dgarcia@askusa.com; www.fedfleet.org

WasteCon 2011 in Nashville Next Month

August 23-25, WasteCon 2011 in Nashville, Tenn. Organized by the Solid Waste Association of North America.

SWANA, Jessica Haislip,
240-494-2253; jhaislip@swana.org; www.wastecon.org

Dates Set for Spring 2012

May 15-17, ACT Expo 2012, the Second Alternative Clean Transportation Expo. Long Beach Convention Center in Long Beach, Calif. Organized by Santa Monica-based Gladstein, Neandross and Associates.

GNA, VP Anne Hellwig, 310-573-8558; anne@gladstein.org;
www.actexpo.com (new website coming soon)

June 3-6, EUFMC 2012, the 59th Annual Electric Utility Fleet Managers Conference. Williamsburg Lodge & Conference Center in Williamsburg, Va.

EUFMC, Ann Brown-Hailey, 757-220-1795;
abrownhailey@cs.com; www.eufmc.com



Meetings!!

Click here for instant access to a complete listing of upcoming meetings and conferences courtesy **Fleets & Fuels**

Going Green Aloft

Flying Green à Paris

Biofuel Blends and Electric Power At Just-Concluded Paris Air Show

Green was the order of the day at June's Paris Air Show, where the traditional oneupmanship got a new twist with camelina- and algae-containing jet fuels (a little at a time), hybrid concepts, and even some all-electric airplanes.

The show is held every two years at Le Bourget, where Charles Lindbergh landed in 1927.

Among the green aviation news at Paris 2011,

- Honeywell claimed the first-ever transatlantic biofuel flight, sending a company Gulfstream G450 business jet from Morristown, N.J. to Paris with one of its Roll-Royce turbofans running on a 50-50 blend of Green Jet Fuel brand camelina-based biofuel and conventional Jet-A.

"Based on lifecycle analyses, use of Honeywell Green Jet Fuel on the flight saved approximately 5.5 metric tons of net carbon dioxide emissions compared to the same flight powered by petroleum-based fuel," Honeywell said.

Camelina is well suited to winter-wheat areas, as it can be planted for modest profit rather than letting fields lie fallow in alternative years.

Advocates say it can actually improve wheat yields.

- Honeywell, a major manufacturer of aircraft auxiliary power units, announced plans for a joint venture with Safran, a landing gear specialist, for "an innovative new electric green taxiing system for new and existing aircraft" – wheel motors drawing on APU electricity to move the airplane when its engines are off. Fuel savings could amount to 4%. The equipment could be deployed by 2016. When it is, "aircraft equipped with this new electric green taxiing system will be able to 'pushback and go' more quickly," Honeywell says, "thus reducing gate and tarmac congestion, improving on time departure performance and saving valuable time on the ground."
- Switzerland's 100% solar electric Solar Impulse flew from Brussels solely on photovoltaic electricity. The all-



Solar Impulse at Le Bourget

composite aircraft with its lithium ion batteries "has a wingspan of 208 feet – similar to that of an Airbus A340 – and the aircraft weighs 1,600 kilos – no more than a typical family automobile," Michael Jerram reported in Paris.

- San Diego-based Sapphire Energy promoted "the world's perfect fuel," a product dubbed Green Crude made by algae needing only carbon dioxide and sunlight. Green Crude, the company says, is no less than a "100% renewable hydrocarbon replacement that can be refined into drop-in replacement aviation fuels and diesel."



Honeywell Gulfstream G450 flew to Paris on a camelina-Jet A blend

Sapphire last month disclosed an agreement with industrial gas giant Linde to co-develop a low-cost system to deliver carbon dioxide to commercial-scale, open-pond, "algae-to-fuel" cultivation installations. It earlier publicized a multi-year pact with Monsanto to develop faster-growing strains of algae via genetic engineering.

- Tom Vilsack because the first USDA Secretary to pay an official visit to the Paris Air Show, stopping by the Alternative Aviation Fuels Showcase in the U.S. Pavilion and doing so as ASTM nears final approval of international standards for bio-based aviation fuels.



USDA Secretary
Tom Vilsack

- Austria's Diamond Aircraft flew its hybrid electric HK36 Super Dimona, which is aimed at the stealthy unmanned aerial vehicle market.
- EADS flew its battery electric Cri-Cri, with four motors and one seat, and described concepts including a low-speed – perhaps 300 mph electric turbofan airliner.

Just after the show ended, KLM claimed the first-ever commercial flight on biofuel, powering both engines of a 737-800 carrying 171 passengers from Amsterdam to Paris.

"The flight was a preview of more than 200 commercial flights between Amsterdam and Paris KLM plans to make in September using the same fuel," the company said.

The fuel was made by a Syntroleum-Tyson Foods joint venture named Dynamic Fuels, which processes non-food grade fats, oils and greases. Production began in October 2010 in Geismar, La.

Boeing's Big Bruiser on Biofuel

Boeing's brand new 747-8 Freighter achieved "the first transatlantic flight of a large commercial airplane powered on all engines by a sustainable aviation jet fuel," the company said. A 15% camelina blend powered all four of the aircraft's GE Aviation GENx-2Bs – themselves representing a new generation of efficient commercial engines.

"No changes were made to the airplane, its engines or operating procedures," Boeing said.



Boeing's new 747-8 Freighter flew to Paris on a camelina blend

Nick Vines photo



For much, *much* more on the 2011 Paris Air Show, check out *Aviation Week & Space Technology's* incredible ShowNews.