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The Hybrid Vehicle and Alternative Fuel Report

March 30, 2016

The Eleventh Anniversary Edition

The fine print: This report is a summary of articles appearing in popular, business, and technical media referring to the impact of fuel costs and fuel efficiency on vehicle technology, development, and markets. At the end of the report is a list of all articles summarized, with hyperlinks to internet sources where available. Some articles may require free registration or paid subscriptions to access. ***The Hybrid Vehicle and Alternative Fuel Report*** (**ISSN: 1946-1011**) is compiled, written, and edited by Thomas L. R. Smith, Ph. D. (hereinafter referred to as "The Editor"), Economic Analysis Branch of the Budget and Financial Analysis Division, Washington State Department of Transportation. Contact ***The Hybrid Vehicle and Alternative Fuel Report's*** editor at smithtm@wsdot.wa.gov or (360) 705-7941. Contributions of news items, original articles, cookies, and positive comments about ***The Report*** are welcome.

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Time marches on: It happens every year at this time: *The Hybrid Report* is another year older and there does not seem to be anything we can do about it. With this issue, we celebrate eleven years of publication. The first issue of *The Report* appeared in electronic inboxes the first day of April in 2005 under the title *The Hybrid, Fuel, and Vehicle Report*. Originally a monthly publication, we added an edition on the 15th of each month and slowly moved the publication date of the other edition to the 30th of the month, so we celebrate March 30th as our birthday. That way, when April 1st rolls around, readers will not mistake the Anniversary Edition for an April Fools' joke. We could just as easily celebrate on the 15th of April, but this way we get our presents, cards, and cake two weeks earlier. We assume there is a hold up at the Post Office because we haven't received any, yet. From a subscriber list of just eight coworkers, *The Hybrid Report* now goes to around 760 people (that we know about) around the world. Out of that number, our friends at the National Security Agency tell us that about 20% of our subscribers actually open our emails and click on the links to *The Report*. A number of our subscribers also forward *The Report* to their friends and coworkers or post *The Report* on their websites and social media pages. Our subscription list includes readers from other state DOTs; other state, local, and federal government agencies; educational institutions around the country; several news organizations; environmental and consulting organizations; and members of the public. We are also listed in the *International Serials Data System Register* (the ISSN in the upper right hand corner) and at least three automakers, *PRNewswire*, and a British news service list us as "accredited media." So, coming to you from our office suite high atop the Washington State Department of Transportation Headquarters Building in Olympia, Washington, it's time for the Eleventh Anniversary Edition of *The Hybrid Vehicle and Alternative Fuel Report*.

HYBRIDS

A truck's trailer could provide power to drive the truck, according to an article in *Green Fleet News* (Berg, March 10, 2016). The trailer hybrid electric system, developed by Hyliion of Pittsburgh, PA, generates electricity from braking and when going downhill, then feeds the power to the truck. The power is stored in a battery pack and can also be used in a sleeper-cab's air-conditioning system. The system will cost a mere $29,500 when it goes on sale in 2017, but a trucker could pay it off in just six months in fuel savings, the manufacturer claims.

At the end of this year or the beginning of next year, Cadillac will begin selling the CT6 Plug-in hybrid, *Motor Authority* (Edelstein, March 21, 2016) authored. The Caddy has a 37 mile electric-only range. The CT6 uses the power train of the Chevy Volt, with modifications. Cadillac will make the car in China and ship it to the U. S., a first for that company. Cadillac has never imported a car to the U. S. before.

Demand for plug-in hybrid cars in the United Kingdom are so high that BMW is cancelling orders that they cannot fill, *Motoring* (Turvil, March 22, 2016) mutters. BMW cancelled at least 65 orders for the 330e because it could not build enough cars. Other manufacturers are also having difficulty meeting orders. Current orders for the Mercedes C350e will not be filled until July or August. While BMW says it has "oversubscribed" the car, Volkswagen says that "demand comfortably exceeds supply" and has increased production. Their delivery time is about 15 weeks.

Toyota finally unveiled the new Prius plug-in hybrid at the New York International Auto Show, the *Detroit Free Press* (Snavely, March 23, 2016) pressed. Toyota calls it Prius Prime.[1] The prime will get 120 miles per gallon equivalent ; 22 miles on electricity alone. It can go up to 84 miles per hour in electric-only mode. It takes over 5 hours to charge the Prime on a 120 volt outlet and 2 and a half hours on a 240 outlet.

ELECTRIC VEHICLES

In our last report, we reported that Seattle's Mayor introduced a plan to cut the city's carbon emissions by putting 15,000 electric vehicles on the road (Oxley, *KIRO Radio*, March 10, 2016). His Honor the Mayor may want to read a new report from Indiana University (March 14, 2016) which ranks Seattle as number 16 in large U. S. cities ready for plug-in vehicles. The report looks closely at the initiatives that the top cities have adopted to encourage electric cars, which seems to be more than planting chargers around the city. In addition to tax incentives on the purchase of vehicles, some

[1] Beating Kia to the punch. I'm sure Kia wanted to call their car Optima Prime.

cities offer free parking, streamlined permitting for residential chargers, and HOV lane access. The report, "Plug-in Electric Vehicle Readiness: Rating Cities in the United States" was published in *The Electricity Journal* and is available for $35.95 at the ScienceDirect website.

Electric car drivers in Aberdeen, Scotland, get another year of free charging, the Aberdeen City Council (March 16, 2016) counselled. Aberdeen's charger network of 34 chargers has been in place since 2013.

The brakes on the Nissan Leaf have a little problem, so Nissan is recalling 46,859 sold in North America for the 2013-2015 model years, *Green Fleet Magazine* (March 12, 2016) says. In very cold temperatures, a relay in the brake booster can freeze, requiring more effort to stop the car. The fix will require Nissan dealers to reprogram the brake control unit software.

Car2Go, San Diego's car sharing company, is replacing its all-electric fleet of cars with gas models, *The San Diego Union-Tribune* (Garrick, March 16, 2016) unplugged. There are not enough charging stations in the area to keep Car2Go's 400 vehicles cars adequately charged. Customers worry about not being able to complete their trips and at any one time, 20% of Car2Go's fleet is unavailable because of inadequate charging. While San Diego has a plan to install 3,500 chargers in the area over the next three years, Car2Go says that is too little, too late.

Indian carmaker Mahindra will debut its e2o electric car in London in April, the *Evening Standard* (Nimmo, March 14, 2016) evokes. The car will start at £13,000 ($18,500.07 US). While Mahindra is one of the world's largest carmakers, outside of India it is virtually unknown. This is the company's first foray into the United Kingdom. The car will be sold online and Mahindra will deliver the car to buyers' homes. When service or repairs are required, Mahindra will come to you.

BigBasket, an online grocer in India will deliver groceries on electric vehicles, *The Economic Times* (Ganguly, March 22, 2016) of India reports. BigBasket will use three-wheel electric rickshaws in Vizag and Vijaywada during testing and a four-wheel electric vehicle in Delhi. BigBasket also uses an electric bike for one hour delivery.

London's test of electric buses on a single route has expanded to another route, *Clean Technica* (Casey, March 20, 2016) claims. Since the summer, London made Route 16 all-electric with BYD double-decker buses. The city is adding five electric buses to Route 98 as well. The buses can go 190 miles and 24 hours on a single charge. Each bus can accommodate 81 passengers.

Way back on January 1, a Norwegian Tesla Model S burned while it was charging at Tesla Supercharger station. *Teslarati* (Hanley, March 17, 2016) reports that Tesla now

knows what caused the fire: a short in the car. Tesla could not identify the cause of the short, but they will update their software package to shut of charging if a short is

detected. Tesla points out that their charging stations have been used 2.5 million times and Tesla cars have been charged 35 million times at home and other chargers without incident.

In New Zealand, an individual can have a bigger impact on carbon emissions by buying and driving an electric car, rather than installing solar panels on their home, *Stuff* (Edmunds, March 22, 2016) says. Concept Consulting, a Wellington company, studied the situation and concluded that since most electricity in New Zealand is produced by hydropower, geothermal, or wind, that solar panels just transfers power generation from one clean source to another. Electric cars, however, transfers power generation from fossil fuels to clean energy. The study warns that this situation is unique to the tiny island nation.

Sorry about the short notice, but we just found out about this ourselves. BMW wants to break the Guinness World Record for the Largest Parade of BMW electric cars, *BMWBlog* (Boeriu, March 23, 2015) blogged. If you drive a BMW i3, i8 or X5 xDrive40e, they want you to get yourself and automobile down to Long Beach, California by 8:00 in the a.m. on Saturday, April 2. Participants will get two tickets to the Long Beach Formula E race to be held later on that day. The existing record of 178 vehicles was set way back in 2008 in Rodental, Germany.

Transit systems tend to look at electric buses as a way to reduce greenhouse gas, but a study conducted by the Divecha Centre for Climate Change at the Indian Institute of Science in Bengaluru (a. k. a. Bangalore) says that there is an economic advantage to electric buses as well (Adheesh, Vasisht, &Ramasesha, March 10, 2016). The profit earned for operating an electric bus in Bengaluru was 3,793,445 INR ($56,546.51, U. S.) compared to 2,074,733 INR ($30,926.74, U. S.). The electric bus is cheaper to fuel and maintain. That sounds really good, until you compare the cost of the electric vs. diesel bus. The electric bus costs 30,000,000 rupees ($447,191.19) while the diesel costs 8,500,000 rupees ($126,704).

While the company is keeping a lid on it, the government of the United Kingdom has given Dyson £174 million ($247 million, U. S.) for the vacuum cleaner company famous for bagless vacuum cleaners to build a new electric car, *The Guardian* (Vaughan & Carrington, March 23, 2016) gloats. The news comes from the Government's National Infrastructure delivery Plan. Dyson previously refused to comment on rumours they were building such a car. Sir James Dyson, in addition to his vacuum cleaner, has invented a fast cargo ship used by the British military, a wheel barrow that uses a ball instead of a wheel, and bladeless fans. Many of his inventions rely on powerful, but small electric motors he designed, which may find their way into a Dyson car.

In Dublin, Ireland, don't forget to pay for the parking space while charging your car, *The Journal* (March 27, 2016) of Dublin journaled. It appears that in downtown

Dublin, some electric car owners forget to pay the parking fee when they charge, which can result in getting booted. In Dublin, you can also get the boot for staying longer than three hours.

ALTERNATIVE FUELS

Your mail may be coming to you fueled by natural gas. *Heavy Duty Trucking* (March 14, 2016) reports that Matheson Postal, a contract carrier for the U. S. Postal Service, increased its green fleet by 25 compressed natural gas (CNG) and 12 liquid natural gas (LNG) trucks. The LNG trucks were sent to Oakland and the CNG trucks will operate between Salt Lake City and Boise from their Boise hub. The company already operates 22 trucks from Seattle.

Your parcels may be coming to you by CNG as well. *Transport Topic* (Reiskin, March 15, 2016) tells us that UPS is putting $100 million into its CNG fleet. UPS will build 12 fueling stations and buy 380 Kenworth tractors. UPS has 6,840 alternative fuel vehicles from hybrid and electric to CNG and propane.

One drawback to hydrogen as a source of clean energy for fuel cell vehicles, is that most hydrogen is created using petroleum or coal. Toyota is making hydrogen from wind-power in Yokohama, *CNBC* (AP, March 14, 2016) cables. Some critics say that you could use the wind power to generate electricity for electric vehicles instead, but Toyota points out that hydrogen is easier to store. Toyota is using the hydrogen to fuel trucks and fork lifts at one factory and warehouses around Yokohama.

Hyundai is in the fuel cell business, too. The Korean car company delivered a Tucson Fuel Cell Vehicle to an Ontario, Canada, customer, *Next-Gen Transportation* (March 14, 2016) transmitted. This is the first Hyundai fuel cell vehicle in Ontario, but there are six in British Columbia.

Air New Zealand is going for biofuel and electricity, *Car & SUV* (Barry, March 16, 2016) says. The air carrier is switching to these fuel sources in its ground and service vehicle fleet. Air New Zealand will add 28 Renault electric vans, 36 electric BMW i3s, and 12 Mitsubishi Outlander plug-in hybrids. The undisclosed number of biofuel vehicles will be for situations where electricity is not an option.

The newly elected Canadian government put out its budget and it includes $62.5 million ($47.2, U.S.) over the next two years for alternative fuel infrastructure including natural gas, hydrogen, and electric vehicle refueling, *Electrek* (Lambert, March 23, 2016) elucidates. The budget also includes tax breaks for businesses to install electric chargers. The Canadian government also plans to replace official limos with electric cars.

Who knew? There was a Hydrogen Week in England and we missed it. As part of the shenanigans and hijinks, the London Hydrogen Network Expansion (LHNE)[2] project broke two distance records in one journey with a Hyundai ix35 fuel cell car, *Blue & Green Tomorrow* (March 21, 2016) bragged. The first record was the longest distance in the United Kingdom on a single tank of hydrogen. The Hyundai got 400 miles. The second record was the longest continuous journey. The car went 6,096 miles over six days. That would sound impressive, but there are only four hydrogen stations in the country and two are in London. So, the record was achieved by driving fifty times around the M25 Motorway (officially known as the London Orbital Motorway) which encircles greater London.

COMING TO A LOCATION NEAR YOU: The latest news on new charging stations which may or may not be somewhere close to you.

United States: Fayetteville, North Carolina,[3] has new charging stations at four places around the city, *The Fayetteville Observer* (Pitts, March 25, 2016) observed. The city's Public Works Commission installed the chargers using a $37,000 grant from the North Carolina Clean Energy Technology Center. The stations, at Honeycutt, Lake Rim, and Clark Parks and at the Marketfair Shopping Center are part of the ChargePoint network.

Around the World: A network of smart solar electric chargers is coming to Utrecht in the Netherlands, the French carmaker Renault (March 11, 2016) announced in a press release. Renault will provide 150 electric ZOE cars for the project that will see 1,000 chargers installed around Utrecht. The ZOEs would be used in a car sharing program. Two Dutch companies, ElaadNL and LomboXnet are also involved in the project. We will be in the region at the end of June and beginning of July, so perhaps we can check on the progress in person.[4]

British Columbia is working on having more chargers in apartment complexes and businesses, *CBC* (Black, March 24, 2016) confirms. The Provincial government has $700,000 in rebate money to cover up to 75% of installing charging stations.

OTHER TECHNOLOGY

We've drawn a blank, folks.

[2] That rolls trippingly off the tongue.
[3] The Editor's birthplace.
[4] Do you think we can convince our bosses that this is a business trip? Didn't think so, either.

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ARTICLES REFERENCED

Aberdeen City Council. 2016, March 16. Electric vehicle no charge cost to continue in Aberdeen. Retrieved: http://www.aberdeencity.gov.uk/CouncilNews/ci_cns/pr_electricvehicles_160316.asp

Adeesh, S. R.; Vasisht, M. S.; Ramasesh, S. K. 2016, March 10. Air-pollution and economics: diesel bus versus electric bus. *Current Science, Vol 110, No. 5*. Retrieved: http://www.currentscience.ac.in/cs/Volumes/110/05/0858.pdf

Associated Press. 2016, March 14. Toyota partners in making wind-power hydrogen for fuel cells. *CNBC.* Retrieved: http://www.cnbc.com/2016/03/14/the-associated-press-toyota-partners-in-making-wind-power-hydrogen-for-fuel-cells.html

Barry, R. 2016, March 16. Air New Zealand moves to biodiesel and electric vehicles. *Car & SUV.* Retrieved: http://www.carandsuv.co.nz/news/air-zealand-moves-biodiesel-electric-vehicles

Berg, T. 2016, March 10. Hybrid Electric-Drive Trailer Tandem Being Developed. *Green Fleet Magazine*. Retrieved: http://www.greenfleetmagazine.com/news/story/2016/03/hybrid-electric-drive-trailer-tandem-being-developed.aspx?utm_campaign=Green-Fleet-Enews-NEW-20160317&utm_source=Email&utm_medium=Enewsletter

Black, M. 2016, March 24. Electric vehicle charging station rebates rolled out in B. C. *CBC News*. Retrieved: http://www.cbc.ca/news/canada/british-columbia/electric-vehicle-charging-station-rebates-rolled-out-in-b-c-1.3505457

Blue & Green Tomorrow. 2016, March 21. London Hydrogen Network Expansion Project Sets Two New FCEV Records. Retrieved: http://blueandgreentomorrow.com/2016/03/21/london-hydrogen-network-expansion-project-sets-two-new-fcev-records/

Boeriu, H. 2016, March 23. BMW electric and plug-in hybrid cars attempt to break Guinness World Record. *BMWBlog*. Retrieved: http://www.bmwblog.com/2016/03/23/bmw-electric-plug-hybrid-cars-attempt-break-guinness-world-record/

Casey, T. 2016, March 20. EV Revolution Hits Tourist-Friendly London Double-Decker Buses. *Clean Technica*. Retrieved: https://cleantechnica.com/2016/03/20/ev-revolution-hits-touristy-london-double-decker-buses/

Edelstein, S. 2016, March 21. 2017 Cadillac CT6 Plug-in Hybrid coming with 449 hp, 37-mile electric range. *Motor Authority*. Retrieved: http://www.motorauthority.com/news/1102968_2017-cadillac-ct6-plug-in-hybrid-coming-with-449-hp-37-mile-electric-range

Edmunds, S. 2016, March 22. Electric cars, not solar panels, more likely to cut NZ carbon footprint – report. *Stuff*. Retrieved: http://www.stuff.co.nz/business/money/78141342/electric-cars-more-likely-to-cut-carbon-footprint-than-solar-power-report

Ganguly, P. 2016, March 22. BigBasket not to deliver goods on electric vehicles. *The Economic Times*. Retrieved: http://economictimes.indiatimes.com/small-biz/startups/bigbasket-now-to-deliver-goods-on-electric-vehicles/articleshow/51504841.cms

Garrick, D. 2016, March 16. Car2Go switching electric cars to gas. *The San Diego Tribune*. Retrieved: http://www.sandiegouniontribune.com/news/2016/mar/16/car-share-car2go-fleet-gas-electric/

Green Fleet Magazine. 2016, March 12. Nissan Recalls LEAF Cars for Brakes. Retrieved: http://www.greenfleetmagazine.com/news/story/2016/03/nissan-recalls-leaf-cars-for-brakes.aspx?utm_campaign=Green-Fleet-Enews-NEW-20160317&utm_source=Email&utm_medium=Enewsletter

Hanley, S. 2016, March 17. Tesla Identifies Cause for Model S Fire in Norway. *Teslarati*. Retrieved: http://www.teslarati.com/tesla-short-circuit-cause-for-model-s-norway-fire

Heavy Duty Trucking. 2016, March 14. USPS Contract Carrier Adds Natural Gas Powered Trucks. Retrieved: http://www.truckinginfo.com/news/story/2016/03/usps-contract-carrier-adds-natural-gas-powered-trucks.aspx?utm_campaign=Headline-News-20160315&utm_source=Email&utm_medium=Enewsletter&btm_ea=c21pdGh0bUB3c2RvdC53YS5nb3Y=

Indiana University Bloomington. 2016, March 14. Indiana University researchers rank U.S. cities' readiness for plug-in vehicles. *Newsroom*. Retrieved: http://news.indiana.edu/releases/iu/2016/03/plug-in-vehicle-city-readiness-study.shtml

The Journal. 2016, March 27. Charging your electric car in Dublin? Make sure you don't get clamped. Retrieved: http://www.thejournal.ie/electric-car-charge-2679232-Mar2016/

Lambert, F. 2016, March 23. Canada will replace government limousines with electric vehicles and invest in EV infrastructure. *Electrek*. Retrieved: http://electrek.co/2016/03/23/canada-will-replace-government-limousines-with-electric-vehicles-and-invest-in-ev-infrastructure/

Next-Gen Transportation. 2016, March 14. Hyundai Delivers First Fuel Cell Vehicle in Ontario. Retrieved: http://ngtnews.com/hyundai-delivers-first-fuel-cell-vehicle-in-ontario/

Nimmo, J. 2016, March 14. Formula E's Mahindra to launch electric cars for commuters in London. *Evening Standard. Retrieved*: http://www.standard.co.uk/business/formula-es-mahindra-to-launch-electric-cars-for-commuters-in-london-a3202316.html

Pitts, M. B. 2016, March 25. Behind the Wheel: Electric vehicles have four more places to charge up in Fayetteville. *The Fayetteville Observer*: Retrieved: http://www.fayobserver.com/news/local/behind-the-wheel-electric-vehicles-have-four-more-places-to/article_a25640df-36cd-5a77-a816-d56372297da8.html

Oxley, R. D. 2016, March 10. Seattle begins major effort to slide into electric vehicles. *KIRO Radio*. Retrieved: http://mynorthwest.com/11/2930693/Seattle-begins-major-effort-to-slide-into-electric-vehicles

Reiskin, J. S. 2016, March 15. UPS to Invest $100 Million More in CNG Vehicles, Fueling Stations. *Transport Topics*. Retrieved: http://www.ttnews.com/articles/basetemplate.aspx?storyid=41243&utm_source=equipment&utm_medium=newsletter&utm_campaign=newsletter

Renault. 2016, March 11. Fleet of 150 Renault ZOE for smart solar charging project. Retrieved: http://media.renault.com/global/en-gb/renaultgroup/Media/PressRelease.aspx?mediaid=76330&nodeid=&utm_campaign=accreditednewsalert_76332&utm_medium=email&utm_source=media.renault.com&pagetomediaid=

Snavely, B. 2016, March 23. Toyota unveils Prius Prime, refreshes Highlander. *Detroit Free Press*. Retrieved: http://www.freep.com/story/money/cars/2016/03/23/toyota-unveils-prius-prime-refreshes-highlander/82031940/

Turvil, S. 2016, March 22. Orders Cancelled As Plug-In Hybrid Vehicle Demand Exceeds Supply. *Motoring*. Retrieved: http://www.motoring.co.uk/car-news/orders-cancelled-as-plug-in-hybrid-vehicle-demand-exceeds-supply_67565

Vaughan, A. & Carrington, D. 2016, March 23. Dyson developing an electric car, according to government documents. *The Guardian*. Retrieved: http://www.theguardian.com/environment/2016/mar/23/dyson-developing-electric-car-government-documents

That'll do.