

EEVC NEWSLETTER

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Now affiliated with EAA

EEVC MEMBER FIRST TO USE FIRST PA PUBLIC CHARGING STATION

On Wed, Nov. 9 EEVC member Don Auker was the first person to use the first public charging station in the state of PA (Philadelphia) charging the first Tesla car sold in PA.



Dignitaries celebrating the first charge on the first public charging station in Pennsylvania

The station is located at the South Port Plaza, Liberty Service Station, 1600 South. Christopher Columbus Boulevard, Philadelphia, PA at Tasker Street.



Don displays an adapter that will mate the charging station's specific J 1772 plug to his Tesla's plug (which is not a J 1772 connector)



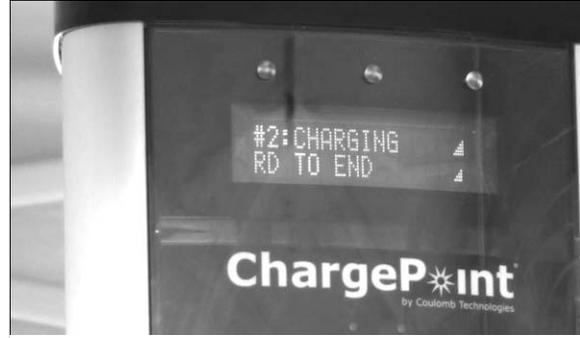
Step two: Connect adapter to Tesla charging plug



Step three: Go to charging station and swipe a special card that will allow you to take the J 1772 charging plug out of its holder



Step four: Plug J 1772 charging station plug into the adapter



Step five: Read charging meter to see if the charge is taking

BEFORE THE EV-1 CAME THE IMPACT

**Accounts taken from the book : *The
Car That Could (Part II)*
Oliver Perry**

At the end of Part I last month GM's Ken Baker was facing a deadline for starting the first production models of the Impact. This month we actually take a few steps backward in the story and review more of the problems that Ken Baker initially faced in turning the proof of concept Impact into a production vehicle.

Review

In June of 1990, Ken Baker, high potential GM engineer from Clarkson College in New York State, with over twenty years experience in GM, was summoned to the office of the newly appointed GM president Lloyd Reuss for a proposition. With the exception of his weight (Baker once topped 300 lbs) and lack of an MS degree, the handsome and middle-aged Baker hoped that he had the credentials to move to a VP level in the company. As Baker entered the top office of GM that day his appearance was greeted in shock by a vice chairman who asked Baker how he had lost 140 pounds. Faced with an early death, Baker explained, he just plain got serious about losing.

After they exchanged greetings Baker became equally shocked when he discovered why he had been summoned to the 14th floor. Baker was asked to head up the GM effort to turn the electric Impact into a production vehicle. (The Impact was the electric show car that Roger Smith had introduced to the world at the 1990 January Los Angeles car

show. See last month's Part I for a review.)

Keep in mind that Baker had once worked on the failed Electrovette. To Baker the experience had been a career stalling embarrassment. The Electrovette, a converted Chevette, ran on zinc nickel batteries powering a DC motor. No solution had been discovered to lower the price of the battery pack. When oil prices dropped in the late 70s the program died a quiet death. If the Impact experienced a similar fate Ken Baker knew that his quest for a VP position would be over. But with the hope that this time GM might follow through on its commitment to produce a car that would make automotive history, Baker took the position.

Michael Shnayerson, writer of *The Car That Could*, describes Baker as a man suitable for the assignment. If he were a car he would have been a convertible roadster, moving fast, open to the elements, with weak shock absorbers barely able to absorb the occasional bumps. He was talented but sensitive and easily hurt.

Baker was told that his job was to launch a test pilot program that could serve as models for future GM projects. Only when the car was ready for production would it be turned over to the Buick, Pontiac, Chevy, or other GM main assembly lines. Until then he had a pack of problems to solve.

At that point in history some executives within GM had begun to realize that the world was changing. To remain in competition GM had to foster programs that would produce new cars independent from the old programs, away from engineers too afraid to try new programs, away from all the politics that had plagued GM cars of the past, and

away from the finance guys. The auto industry was being forced to depart from long assembly line, high volume production vehicles to creating smaller, faster, lower volume, specialty made vehicles. In addition to redesigning an electric car for volume production, Baker's job would be to pioneer in a new approach to the car manufacturing process. According to the author, there was more to Baker's assignment than producing the Impact for the market.

Show car to Road Car

As discussed last in last month's article, the Impact show car as it existed had a lead acid battery pack that contained an equivalent of a gallon and a half of gasoline. The AeroVironment team that developed the vehicle claimed the car could go 120 miles on that battery pack. But the proof of concept Impact had few amenities that new owners would demand, a weak chassis and was not crashworthy.

Shnayerson points out that when AeroVironment's whiz kid from Silicon Valley, Alan Cocconi, met the GM Chiefs on the test track to give them their first ride in the Impact, that although all were impressed, they found notable weaknesses. The car had a terrible suspension, a harsh ride, no solid chassis, inadequate motorcycle brakes, and a gear noise that would be impossible to muffle completely with without engine noise to mask it. The Impact as it appeared on the test track that day accelerated silently and impressively in a straight line, but that was about it.

Somehow Baker was expected to correct the steering, braking, handling, and gear noise, plus provide consumer amenities, make the car crashworthy, and preserve (or hopefully extend) the 120 mile range using affordable lead acid batteries. All of this and still provide consumers a sticker price that would sell thousands of cars. If he succeeded, Baker was told that GM would produce the world's FIRST mass marketed electric car.

John Williams a GM engineer who had done a secret study on feasibility, and newly appointed president Lloyd Reuss, jointly made the decision that the concept Impact with improvements could become a profitable production car. Later Baker discovered

that their decision had been based more on instinct than facts. Ken Baker knew that when he accepted the Impact production position that GM expected him to succeed even it was unrealistic.

Transforming the Impact, the Electric Show Stopper, a one-of-a-kind model, into an assembly line product within months was Ken Baker's challenge. Politically speaking Baker wondered if he had been set up to fail.

(To those EV enthusiasts who feel that this task should be easy for a big company like GM to fulfill, keep reading.)

Do We Remember ?

The first Impact built by the AeroVironment R&D team in California, the (secret) Project Santana, had two 50 kW three phase AC electric motors driving the front wheels. Alan Cocconi designed the inverter needed to change the DC battery current into AC. It was the most complex part of the show vehicle. Shnayerson relates that Cocconi first designed the inverter on his computer screen and then soldered every one of the 5000 components to the correct circuit boards by hand. Cocconi had succeeded where years before an engineer at GM by the name of Paul Agarwal had given up in disgust when attempting the same feat for the Electrovette project. In fairness to Agarwal, the electronics in his day were too crude and expensive to be successful.

It had taken months of home labor for Cocconi to built two 50 kW inverters, one for each motor. In order to convert DC current (electrical energy flowing in one direction) to AC (electrical energy vibrating back and forth) one must switch the DC current rapidly on and off. The rate at which one turns the current on and off determines the frequency of the AC. Because the motors were three phase AC, (similar to feeding three separate sources of AC power into the motor at once at slightly different time intervals) each inverter needed three switching stations, each with 48 semiconductor transistors: 288 transistors in all. The switching stations switched the 320 volt system 20,000 times a second. Both were packaged in an attache-like case with the net weight of only 61 pounds. No one had ever designed and built such an intricate, compact, and lightweight inverter

before.

The total cost of the electronics in the concept show car had been \$100,000. And, although these electronic parts were expected to work day after day, year after year, early tests demonstrated that after twenty hours one of Cocconi's power switches, called a MOSFET (metal oxide semi-conductor field effect transistor), would blow, taking out the whole string.

Cocconi was not a GM employee, but worked for AeroVironment. When Baker assumed the role as project manager of the Impact project he hired Jon Bereisa to supervise the electronic development of the Impact. Jon Bereisa was a brilliant engineer who had worked formerly with Baker on the Electrovette program. When looking at Cocconi's inverter Bereisa claimed that IGBTs (insulated gate bipolar transistors) were superior to the MOSFETs that Cocconi's had used.

At that time MOSFETs were about the size of a postage stamp limited in size to the delicate amount of silicon crystal that industry could produce. Each chip could only pass a limited amount of current. So Cocconi had strung enough MOSFETs in a series parallel combination to accommodate the current required. Unfortunately when one transistor burned out a chain reaction took out the rest.

The newly developed IGBTs came along at just the right time. Up to then there had been little demand for high current transistors. The IGBT, was according to Shnayer-son, a beautifully compressed piece of solid state circuitry about the size of a pack of cigarettes. It contained four silicon chips instead of one, providing greater area to pass current. It had fewer parts than a clump of equal MOSFETs and proved to be more reliable. A single IGBT could replace 24 MOSFETs. Hughes engineers, assigned to find a way to mass produce Cocconi's inverter, discovered that his inverter had over 7000 parts in all counting nuts and bolts and took over eight man-weeks to construct, at a cost of hundreds of thousands of dollars each. Cocconi disagreed with their assessment, arguing that in time the cost of MOSFETs would come down. He objected to having Hughes aerospace engineers mess with his elegant creation.

Hughes, on the other hand, continued to maintain that the Cocconi inverter needed enormous refinement and might not be reproducible at all. The plan was for Hughes to replicate a number of Cocconi's inverters with the help of AeroVironment engineers and Cocconi. Cocconi, known to be difficult, at first was pleased to be invited to work in a top secret military clearance only lab. But even with his help and cooperation the replication proved to be a nightmare. Cocconi had only taken notes on 2% of his work that he had created in his own home. Hughes engineers had to take pictures of his work and try to reverse engineer the box. The circuit boards were nearly impossible to map, much less reproduce.

In addition to having MOSFETs, Cocconi's inverter had a built-in controller which used an analog system rather than digital. Its drawback was that the signals began to drift and wander, requiring constant frequency adjustments. As far as Hughes was concerned it was time to bring the Cocconi inverter into the digital age.

Eventually a showdown meeting was called for at the Hughes site in California to make clear who would eventually control the production of the Impact inverter. Baker's appointee, Jon Bereisa, presided at the meeting. Bereisa, set the tone by telling everyone that he was going to be the boss and an absolute tyrant. He told them that he had all of the money and everyone had to dance to his tune.

Cocconi was present at the Hughes meeting along with AeroVironment's Alec Brooks. Cocconi heard Bereisa say, "The second thing is that you are not going to get around me technically. You're not going to wiffle up some conjured excuse...and sell me some rotten meat in the case."

Cocconi years before had been selected as a GM scholar and only one of a handful of students around the country to be awarded full two year tuitions for working summers in advanced development GM facilities. Cocconi had actually worked under Bereisa for a spell. Both men were brilliant, proud, strong willed, and a generation apart. At the meeting Cocconi was beginning to see Bereisa as an ethical and corporate sellout, squandering his talents for job security and a big pay check. In Cocconi's mind Bereisa would never be

able to work for the common good. Cocconi's inverter was still a "one of a kind." He didn't want Bereisa having anything to do with it.

If Cocconi had wanted to become a part of the GM corporate world he could have signed on years before. But he had not. And he could have asked to work with Baker's team as a GM employee but he did not. (Neither did any of the AeroVironment engineers who built the first Impact.) Without commitment to GM Cocconi and other engineers from AeroVironment were beginning to take the position that GM now owned their creation. They sensed that after they had turned over their work and all of their secrets to GM they would no longer be needed and would be scrapped.

As Baker's department began planning the transition from concept car to production, Hughes engineers continued to find fault with AeroVironment's creation. They felt the range of the Impact had been inflated and that the whole car was somewhat of a sham. Based upon making dozens of replicates of Cocconi's inverters they concluded it was underpowered. It continued to blow out MOSFETs, especially in warm weather. Hughes engineers thought that Cocconi's "smart pole" clusters of MOSFETs were merely tricky mechanical assemblies with a couple of low-tech circuit boards attached. A bad assembly done six times and a nightmare to build. How could Hughes ever build these things for \$2000 each?

For the Los Angeles car show the AeroVironment team had painted the Impact silver to indicate that it should be built out of aluminum. GM argued that aluminum would be too easily dented and too expensive to use. AeroVironment used air cooling for the electronics for simplicity but GM claimed that liquid cooling was needed. Hughes also decided that they should abandon Cocconi's onboard charger because it constantly tripped the ground fault systems and added unneeded weight. Cocconi in response accused Hughes of trying to corner the market on EV off board chargers, making people purchase their charger at inflated prices.

It was only a matter of time before Alan Cocconi walked into AeroVironment's office and said he was quitting. About a year after

helping to make the first Impact concept car, in January 1991, Cocconi said he needed to clear his mind. He had made enough money to last for a while. With a few possessions he got on his racing bike and rode out into the California desert.

The story continues..... next month.

PRESIDENT'S MESSAGE Oliver Perry



The Wall Street Journal, Nov 29th 2010

Energy: The Journal Report

How to Change the Global Energy Conversation

The article begins by stating that it is time for a rethink on climate change. It does not matter whether you believe carbon dioxide from emissions is creating drastic changes in our weather and climate or not. The world is NOT going to hammer out a workable deal on attempts to reduce global warming. The same issues have been kicked around for years with no workable agreeable resolution. We are stumbling over the same roadblocks year after year. At the heart of the issue is MANDATED emission cuts. These cuts result in paying a whole lot more for green energy. Although some greens deny it, green energy still costs more than fossil fuels. The problem, say writers Ted Nordhaus and Michael Shellenberger, co-founders of Breakthrough Institute, a public policy think tank in Oakland California, is that forcing countries to agree to emissions caps will never work. Instead they maintain that the focus should be on technology innovations.

"Until clean energy becomes much less costly there are relatively cheap fixes we can make to curb emissions, such as closing the most inefficient coal plants. And, in poorer countries we can focus on fixing highway, railway housing, sewage, and electrical systems.

"Our highest goal should be to make clean

energy radically cheaper and truly competitive with fossil fuels through innovation.”

“Emissions cuts have overshadowed technology innovation for so long in part because of a widespread myth that today’s clean energy sources are either ready or almost ready to replace fossil fuel. They are not. It will take much more innovation to make them cost-competitive.”

(My personal view is that as electric vehicle enthusiasts we must continue to temper our desire for wider spread use of the electric car with the reality that they still cost more to manufacture, own, and drive than conventional vehicles. Experts in manufacturing, sales, and finance see no quick and easy route to achieving mass acceptance of the electric car as long as plentiful and cheap oil and gas exist. If we have some technical breakthrough in developing cheap and plentiful electric energy onboard storage that may change things.)

Old vs. New Approach to Change

The old route to change was setting a high tax on carbon to make alternative energy more competitive. The new approach should be to invest in making new clean energy technology cheaper.

The old approach was to impose strict controls on carbon dioxide emissions. The new approach should be to focus on MODEST emission reductions such as replacing old inefficient diesel generators.

The old approach was to force wealthy countries responsible for most of the emissions to send money to help poorer ones adapt to the effects of climate change. The new approach encourages helps countries to deal with the effects of drought or flooding no matter what the cause.

The old approach was to use the United Nations to work out comprehensive agreements. The new approach is to focus on an agreement among the world’s 20 largest countries. The United Nations is a powerless institution bogged down in political warfare. The world’s biggest economies have more of a realistic clout to make a difference and a better chance of reaching some kind of workable agreement than the U.N.

“All Aboard For Energy”

WSJ Nov 29th page R 9

A new energy company called Kinetic Trac-tion Systems, a spinoff from an energy storage company Pentadyne Power Corp has a \$4 million contract to install flywheels on the Long Island Railroad. When a train pulls into a station the braking energy goes into the flywheel system absorbing as much as 3 megawatts. It then releases its energy 20 or 30 seconds later to help the train to reaccelerate.

(The article had no comment regarding cost effectiveness of the system.)

The End of Deep-Water Drilling? Not in Brazil.

WSJ Nov 29th page R3

(If you believe we are going to run out of oil tomorrow or that the cost of getting it will become prohibitive, think again.)

Although deep-water drilling may have temporarily come to a halt in the Gulf of Mexico in other parts of the world the same industry that was shut down in the Gulf is moving full speed ahead at a frenetic pace in places like the Gulf of Guinea, the Mediter-ranean, and the Turkish Black Sea, and even faster off the coast of Brazil. Petroleo Brasileiro, known as Petrobras, last month began production in one of the largest oil fields discovered in the Western Hemisphere in thirty years. And a recently discovered field nearby could contain the equivalent of 15 billion barrels of oil, say Brazilian regula-tors, equal to almost two-thirds of the total proven deposits of crude in the U.S.

“Petrobras and companies such as Chevron Corp, Statoil ASA (Norway) and Tullow Oil of the UK are racing to drill thousands of feet below sea level because that is where the last remaining undiscovered resources of oil are located. Companies can derive huge profits from tapping these fields and countries can gain long-sought energy security.”

Although Petrobras suffered the loss of a large deep-water platform drilling rig in 2001 the company moved on to tap large sources of crude captured under salt domes deep beneath the surface. They now field more deepwater rigs than any other oil company and have raised \$67 billion (the largest equity offering in history) to further pursue deep water drilling.

A large, developing country with massive energy needs, Brazil for a long time was a major importer of oil. Brazil's crude production totaled 2.5 million barrels a day last year, enough to meet all of its needs.

Stepping on the Gas

WSJ Nov 29th page R3

Natural gas vehicles are taking off in some surprising places. The following countries have the most natural gas vehicles.

1. Pakistan 2,300,00
2. Argentina 1,897,186
3. Iran 1,665,602
4. Brazil 1,632,101
5. India 935,000

"Experts say that one of the reasons natural gas vehicles haven't caught on in the U.S. is because the U.S. lacks a widespread network of refueling stations. (And, gasoline is still relatively inexpensive, providing little incentive to switch.)"

Compressed natural gas vehicles are considered cleaner than gasoline vehicle equivalents but lack equivalent driving range.

Electric Cars Make Sense Now, Their Future is Bright

WSJ Letters to the Editor, Oct of 2010 (I lost the page number and date)

Mark Reuss, President of General Motors Co. in a letter to the editor makes the following statement. "Holman Jenkins's skepticism of electric cars (*VolteFace Business World*, Oct 20) ignores the fact that electric cars are in their early stages of development. As battery technology matures and the infrastructure is built, price, performance, and acceptance of electric vehicles will inevitably improve."

"Mr. Jenkins also ignores the fact that petroleum is not infinite and gas prices are likely to rise over time. Electric Vehicles are not the only answer, but they will be a big part of any solution, and it takes an investment by many players, including auto makers, utilities and government, to help this industry grow."

"More than 120,000 potential Volt customers have already signaled interest in the car and orders have flowed since the summer." "This gives us confidence that the Volt will succeed on its merits."

NEWS UPDATE

Volt Named Motor Trend Car of the Year

Motor Trend's recognition of the significance of the Volt can be interpreted as a signal that the EV community was right all along, and that, finally, EVs have gone from being the cars of the future ("The Future is Electric") to the cars of today.

"We expected a science experiment, but this is a moon shot," *Motor Trend* editors wrote for the January 2011 issue. "The Volt delivers on the promise of the vehicle concept as originally outlined by GM, combining the smooth, silent, efficient, low-emissions capability of an electric motor with the range and flexibility of an internal combustion engine. It is a fully functional, no-compromise compact automobile that offers consumers real benefits in terms of lower running costs."

And its drive system gets its own award

Ward's AutoWorld magazine has selected the Volt's propulsion system as one of the winners of the automotive industry's "10 Best Engines." Selection criteria included noise, vibration and harshness (NVH), fuel efficiency, new technology and comparative data for similar systems. Editor-in-Chief Drew Winter called it "Brave. Inspired. Brilliant." Not bad.

More good words for the Leaf

Ward's Auto World also had some good things to say about the Nissan Leaf. In a December 1 piece Christie Schweinsberg wrote that "The Leaf delivers on Carlos Ghosn's promise to build an EV suitable for the majority of everyday drivers," and added that with instantaneous torque, it's "a blast to drive." On the other hand she considers the car's 100 mile range a huge drawback, but doesn't seem to think it's fatal.

Also of note: Nissan says the Leaf gets 99 mpg equivalent.

Ford announces first Focus markets

Ford has announced the first markets into which it will sell the Focus Electric when it comes out in 2011: Atlanta, Austin, Houston, Boston, Chicago, Denver, Detroit, Los Angeles, San Francisco, San Diego, New York,

Orlando, Phoenix, Tucson, Portland, Raleigh Durham, Richmond, Seattle, and Washington, D.C. Sorry, Philly isn't mentioned. Selection criteria included existing hybrid purchase trends, utility company collaboration and local government commitment to electrification.

College team complete 16k mile EV trip



On November 16 a team from Imperial College London celebrated the end of their 26,000 km (16,000 mi)

journey after driving their all-electric supercar down the length of the Americas. The SRZero started in Alaska in July 3, went down the Pan-American Highway and finished at Ushuaia in Argentina, the world's most southerly city, having passed through 14 countries in 140 days. The car, from UK-based Radical Sports Cars, Ltd, has a top speed of 124 mph, a range of 250 miles or more, and peak power of 400 hp.

How about a few oddities?



The EV field attracts some free thinkers, and sometimes those free thinkers live inside big and supposedly stodgy companies. A case in point is a creation from General Motors

called the EN-V, which was first shown at the 2010 Expo Shanghai. The vehicle looks like a Segway with a pituitary condition: two wheels, side-by-side, and two upright seats also side-by-side. The idea, says Chris Borroni-Bird, General Motors director of Advanced Technology Vehicle Concepts, is to reduce the physical footprint a a vehicle meant to be used in a crowded urban setting.

The car is envisioned as a thoroughly-connected thing, even to the point that "a user could summon an autonomous vehicle to his or her location using a smartphone application and then sit back and relax while they are whisked off to a destination," says GM.



In August of 2009 we ran a news item on a low-speed two-passenger vehicle called the Whip, from Wheego Electric Cars.

Now a November 22 story on *Greentech Media* reports that the Wheego Whip LiFe, which claims a top speed of 65 mph and a range of 100 miles, will be shipping to dealers this month, with full production scheduled for March. The writer, Michael Kanellos, took one for a test drive and reported that it was sparse inside, hesitated on acceleration and had "mushy" brakes, but cost only \$32,995.

Fleet purchases of EVs

Both General Electric and Hertz have announced that they plan to buy large numbers of electric cars. On November 11 GE announced that it will purchase 25,000 electric vehicles by 2015 for its own fleet and through its Capital Fleet Services business. The company will initially purchase 12,000 GM vehicles, beginning with the Chevrolet Volt in 2011, and will add other vehicles as manufacturers expand their electric vehicle portfolios.

On November 22 Hertz announced a joint partnership with CODA Automotive to bring, in 2011, its new four-door, five-passenger all-electric CODA Sedans to Hertz's California locations as part of the Hertz Global EV program.

As announced in September, Hertz Global EV will be the first company to provide a range of all-electric vehicles and charging stations on a rental and car-sharing basis at global scale. The CODA Sedan will join vehicles from Nissan and other manufacturers as part of Hertz Global EV's diverse fleet. With a range of 90 to 120 miles per charge

during all seasons, the CODA Sedan is designed to be plugged straight into a standard household unit, among other charging options, for a seamless experience.

A different kind of hybrid bus

On December 2 the hybrid systems research team at GE Global Research demonstrated a dual battery system on a zero tailpipe emissions hybrid transit bus that pairs a high-energy density sodium battery with a high-power lithium battery. GE researchers believe a dual system with high power and energy storage capacity could achieve the optimal electric driving range and acceleration requirements at a more practical size scale and cost for larger vehicles. The research is being done as part of a \$13 million research project GE is engaged in with the Federal Transit Administration (FTA) and Northeast Advanced Vehicle Consortium, funded under the National Fuel Cell Bus Program.

The idea is that lithium batteries can provide heavy currents for acceleration, but sodium batteries can hold more energy. “In addition to optimizing performance,” says GE, “a dual system can reduce the cost of a battery by up to 20% compared to a single battery system for vehicle applications like transit buses and delivery trucks that require significant power and energy storage capacity.”

Years ago (back when lead-acid batteries with about it for EVs that anybody could afford) EEVC co-founder Guy Davis suggested equipping a car with two sets of batteries in parallel: a set of deep-discharge modules for bulk energy storage and a set of SLI (starting, lighting and ignition) batteries (aka regular car batteries), with the electrolyte gravities adjusted as necessary so the voltages would match. He didn't get around to doing that, but there came a time that he put a set of computer backup batteries into an EV, and because they were smaller than the golf cart modules then in general use he wired several sets in parallel. The first time he hit the accelerator he left a trail of smoke and burnt rubber, showing the benefit of lower per-module current and resistance for improved performance.

EVS ON DISPLAY IN CALIFORNIA **By California Pete**



Several good-size auto shows took place in California this past month, one in L.A. and one in S.F, and both showed a fair number of EVs.

Greentech Media's Michael Kanellos attended the L.A. show and reported that Fisker displayed its

first production hybrid Karma, with full production scheduled for the first quarter of 2011; a very limited production of the Volvo C3 EV by 2011; an all-electric FIAT in 2012; and both plug-in and an all-electric Hondas in 2012.

The San Francisco show had a respectable number of alt-en vehicles, including the Volt, the Leaf, a plug-in Prius, a cut-in-half demonstration model of the Nissan XTrail FCV, a Toyota Highlander fuel cell hybrid, and hybrids from multiple makers.

Selling some actual U.S. products to China

On Nov. 23 the *San Francisco Chronicle* reported that Santa Rosa-based Zap “has just signed a deal with Shanghai officials to provide charging stations, battery swap facilities and maintenance depots for the city's commercial Yangpu district.

“Zap will also develop a pilot Electric Vehicle Eco-City program involving the use of Zap vehicles in Yangpu's bus, taxi and government fleets. Sales and marketing offices and R&D centers will be located there.”

Erin Brockovich where are you?

The 2000 movie “Erin Brockovich” told the story of a difficult fight to get Pacific Gas & Electric to acknowledge, and do something about, a plume of toxic hexavalent chromium that had polluted groundwater beneath the Mojave Desert town of Hinkley, resulting in a \$333 million settlement and the buyout of a number of landowners. Well, the Cr(6) just keeps spreading, and in November PG&E proposed buying up 100 additional properties.

Tesla still in the red

On November 9 Tesla Motors reported that its third-quarter loss had increased to \$34.9

million on weaker sales and unexpected costs for developing the Model S. The loss in the previous third quarter was \$4.6 million. It's a lousy time to start a car company, but the share price hasn't suffered much: It was \$29.36 the day after the announcement and closed at \$31.34 on Tuesday.

More S.F. Lunacy

Here's your monthly installment of Left Coast Follies:

On November 24 San Francisco's Board of Supervisors overrode the mayor's veto of legislation to bar fast food restaurants "from giving away toys in kid's meals sold in San Francisco unless they have reduced calories, salt, fat and sugar and also include fruit and vegetables," said the *Chronicle*. The new law goes into effect in a year.

Wonder what these people would think of cheesesteaks, which include, according to the old *Philadelphia Inquirer* columnist Clark DeLeon, all four major Philadelphia fast food groups: bread, meat, dairy and grease.

Closing a Haight Ashbury Institution

For 36 years the Haight Ashbury Neighborhood Council has operated a recycling center in Golden Gate Park, where people have traded in cans and bottles for enough cash for a meal, a drink or a fix. But in recent years there has been considerable pressure to close the place because "it is incompatible with the park, creates noise and serves as a magnet for homeless people and crime," says the *Chronicle*. Since many of the cans and bottles recycled come from the recycling bins the neighbors put out for city collection, they may have a point.

Anyway, despite protests by the left wing, the place is scheduled to close in a few months and be replaced by community gardens. And we move ever farther from the Summer of Love.

No cutting here

Finally, a group in San Francisco who call themselves "intactivists" are pushing to have circumcision made illegal — even for religious reasons. Oy gevalt! (or Holy Mohely).

COMING EVENTS

10X Advanced Battery R&D

Jan 10-12, Santa Clara, CA. For information go to www.infocastinc.com/index.php/conference/413

Networked Solar: The Convergence of Smart Grid and PV

Jan 25–26, Jersey City. Info: www.electric-vehicle-charging-infrastructure.com/

EV Charging Infrastructure USA 2011

Feb 28 - Mar 1, San Francisco. www.electric-vehicle-charging-infrastructure.com/

Green Truck Summit

March 7-10, 2011, Indianapolis, IN. Contact Susan Romeo, sromeo@calstart.org, 626-744-5600

EVs in Macungie

April 30, Macungie Memorial Park. Contact jisaacs@buckscountyrenewables.com.

Solar 2011

May 16-21, Raleigh, NC. For info go to www.ases.org/index.php?option=com_content&view=article&id=18&Itemid=147

11th Challenge Bibendum

May 18-22, 2011, Berlin, Germany. Go to www.challengebibendum/en

MEETING SCHEDULE

Meetings are held in Room 49, Plymouth-Whitmarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m.

Jan 12

Feb 9

Mar 9

Apr 13

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