EEVC NEWSLETTER

Published by the Eastern Electric Vehicle Club

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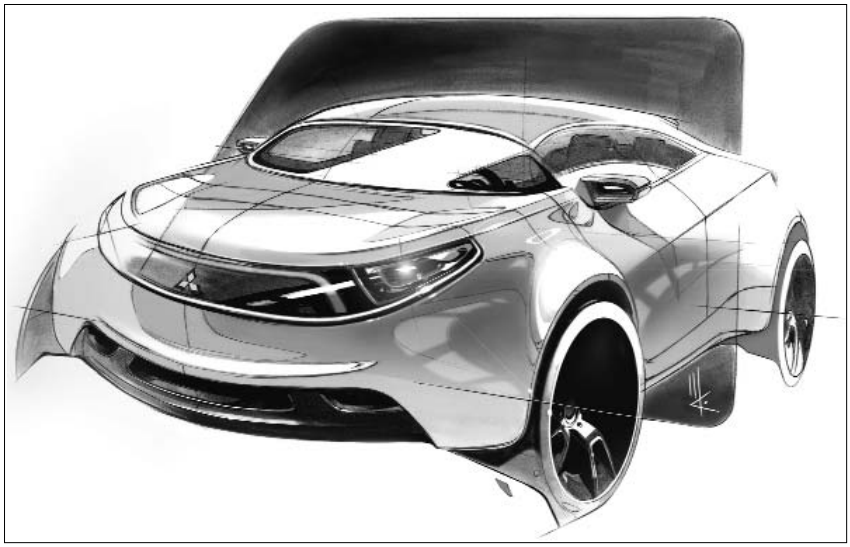
Vol 25 No 12
DECEMBER, 2005

Now affiliated with EAA

NEWS EVS: SOME REAL, SOME NOT

In recent months a number of companies have come out with new EVs. This month we'll talk about two: A concept car from Mitsubishi and an actual vehicle from a Canadian manufacturer with the improbable name Feel Good Cars.



MITSUBISHI Concept-CT MIEV hybrid 4WD sport compact concept car

Mitsubishi concept car

An item in the July 2005 issue of this newsletter mentioned that Mitsubishi Motors was working on a concept EV called the MIEV (Mitsubishi In-wheel motor Electric Vehicle) that would use lithium ion batteries and in-wheel motors. Mitsubishi has now announced that it will show the *MITSUBISHI Concept-CT MIEV* hybrid 4WD sport compact concept at the 2006 North American International Auto Show (the Detroit Motor Show) which will be held from January 8 to 22 at the Cobo Center in Detroit, and will be open to the general public from January 14.

Earlier versions of the car had used a Colt compact car as a rolling test bed for the technology.

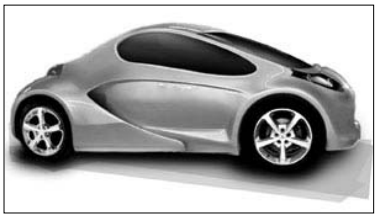
New NEV from Canada

The second new car is the ZENN (Zero Emission No Noise), billed as a luxury neighborhood electric, vehicle from Feel Good Cars Inc., Toronto, ON, 877-817-7034, www.feelgoodcars.com.

Specifications are as follows:
Maximum speed: 25 mph (40 km/h), limited according to FMVSS 500/CMVSS 500 (United-States/Canada).
Range: 40 miles (64.4 km)
Gradability: 30% GVWR
Charging: 8-9 hours (120 VAC), 80% rechargeable in four hours
Batteries: 6 x 12 V heavy-duty, flooded type. (Valve regulated sealed lead-acid AGM technology, zero maintenance & non-spillable and other advanced battery options also available)
Dimensions: 2-Seater:
L - 109.8 in. (278.9 cm) W - 58.8 in. (149.4 cm) H - 55.9 in. 142 cm)
4-Seater and 2-Seater long wheel base:
L - 120.8 in. (120.8 cm) W - 58.8 in. (149.4 cm) H - 55. in. (142 cm)
Configuration: 2-Seater and 2-Seater and 4-Seater long wheelbase
2-Seater flatbed utility in 2006
Propulsion: Front wheel drive, 100% electrically driven, 72 Vdc/5 hp (3.7 kW)
Body type: 3-door hatchback, fully enclosed, automotive aluminum alloy space frame, ABS body panels, aluminum alloy front-end frame
Curb weight: Approximately 1200 lb (544 kg) depending on model
GVWR: 1705 lb (773.4 kg)
Brakes: Dual hydraulic system, four wheel disc, 6.7 in. (172 mm) with electromagnetic regeneration
Wheel base: 2-Seater - 70.8 in (179.8 mm)
2-Seater and 2-Seater and 4-Seater long wheelbase 81.8 in. (207.8 mm)
Track: Front and rear - 49.8 in. (126.5 mm)
Suspension: Front: independent front wheel suspension with two coil spring/shock units.
Rear: trailing arm with two coil spring/shock units
Steering: Automotive rack and pinion with permanently sealed tie-rod ends
Safety: Meets frontal and offset European crash standards
Price range: Retail $9,995 US – $15,000 US

Two new cars from ZAP were on display at the San Francisco Auto Show.

The first is the Xebra (left), a low-speed vehicle classed as a motorcycle and built in China. First deliveries are scheduled for January. Specs are as follows:
Speed: Up to 40 mph (65 km/ph)
Range: Up to 40 miles (65 km)
Charger: On-board 110 Vac
Motor: DC
Seating: Up to four
Battery: Lead Acid
Classification: 3 wheel motor driven cycle
Dimensions: 9.5 feet (290 cm) long x 4.66 feet (142 cm) wide x 5.05 feet (154 cm) high
Colors: Kiwi Green, Aqua Turquoise, Sunset Red and Zebra Flash
Options: Luggage rack, Leather Seats, 220 V Charger
Price: Approx $8995.



The second ZAP car is the Obvio!, to be imported from Brazil. Plans at this point, according to ZAP's Alex Campbell, are to make the vehicle a so-called Trybrid, capable of running on gasoline or alcohol (Brazil has an enormous ethanol program). The design is far from final, says Campbell, and cars may be available in 2007.

ETHANOL VS METHANOL

Dave Goldstein, president of EVA/DC, has been involved in a running discussion with several other members of the DC club on the relative merits of ethanol and methanol as a vehicle fuel. Here's a sample of What Dave has to say, but first a little background:

Chemically, ethanol and methanol are both alcohols. Both burn and both will mix with water in any proportion. Ethanol, (otherwise known as grain alcohol or ethyl alcohol), is

C_2H_5OH, the active ingredient in booze, and is usually derived from the fermentation of sugars are starches and concentrated through distillation. Methanol, (otherwise known as wood alcohol or methyl alcohol) is CH_3OH and highly toxic. Drinking it will cause blindness or death. It's generally synthesized from natural gas or coal.

Dave prefers ethanol as a fuel. "'Cellulosic Ethanol,'" he says, "(in addition to PHEVs) is one of the key transportation policy recommendations of the bipartisan National Energy Policy Commission, which issued its report last Spring. By 'Cellulosic Ethanol,' we are essentially referring to plant wastes, such as corn stalks, as opposed to the corn itself, which is better used, IMHO, as a food product to help feed the world's hungry.

"Other possible sources include wood wastes from forestry harvesting and lumber yards; spoiled produce from grocery stores and food wholesalers; energy plantations, where crops or trees would be grown as a feedstock; and paper wastes — a huge and widely-available byproduct often found in places like Washington, D.C."

"Overall, I think that I prefer Ethanol — in addition to PHEVs and EVs — because of its renewable characteristics. It is the almost ideal feedstock for the ICE portion of a PHEV. As E85, it would displace 8.5 gallons of petroleum-based "dinosaur fuel" in a 10 gallon PHEV tank, effectively yielding a net "666 miles per gallon" of gasoline content in a 100 mpg PHEV! What a great way to promote U.S. Energy Independence!

"And Ethanol blends would greatly improve the knock index (octane) of the fuel, allowing for higher compression ratios, and hence, sports car performance from a very tiny ICE.

"Methanol, OTOH, is today largely created from natural gas, which is neither renewable nor in abundance, and which has been rising dramatically in price. In addition, NG primarily consists of methane, which is an extremely potent Greenhouse Gas — many times more harmful than CO or CO_2 to the Earth's climate! And once released, it stays in the atmosphere for more than 100 years!

"Methanol has largely fallen out of favor with automotive engineers and transportation energy planners, in part because of its corrosiveness, as well as cost disadvantages which are related to its NG feedstock.

"We would also not want to see this poisonous liquid escaping into underground aquifers through leaking underground tanks and fuel spills, creating a similar situation to the fuel additive MTBE, which is still poisoning many communities.

"On the 'merit' side, rising oil and NG prices enhance the potential for methanol production from coal. And as my friend, associate, EVA member and former EPA official Morris Altschuler is fond of pointing out, 'The U.S. is the Saudi Arabia of Coal!'

"That is significant because the day may come when we will discover that even with the rapid increase in PHEVs, EVs, ethanol and ethanol blends, that there will still be a significant shortage of transportation fuels in the U.S., owing to the realities of Peak Oil and the rapidly growing demand for transportation fuels from China and India.

"So I tend to view methanol as somewhat of a 'wild card' as an alternative fuel, and would not rule it out entirely. Additionally, methanol can be used in fuel cells, although I think that the biggest application over the next 20 years is likely to be Stationary — as opposed to Transportation — Fuel Cells."

Mahi Reddy points out that another possible source of useful biofuel may be the Jatropha plant, which yields bio-diesel. Reddy cites an announcement that the government of India is mandating that 10% of all fuel sold in the country should be bio-diesel. Daimler Chrysler, he goes on, has launched a major initiative to promote this fuel in its Mercedes line of automobiles. See the web site below for more information.

http://www.daimlerchrysler.com/dccom/0,,0-5-7165-1-446319-1-0-0-446301-0-0-243-7165-0-0-0-0-0-0-0,00.html."

ELECTION RESULTS

The results for the election of officers are in; all incumbents have been re-elected:

- President: Oliver Perry
- Vice President: Mike Deliso
- Secretary: Anne and Tom Moore
- Treasurer: Tullio Falini
- Editor: Peter Cleaveland

PRESIDENT'S MESSAGE
DECEMBER 2005
Oliver Perry

This month I thought I would provide my readers with some information, facts and thoughts taken from a collection of newspaper articles. The topics are environmental and energy related, and involve differing economic and political views. The debate on how to best solve our energy problems continue.

Former President Clinton Speaks Out!

Several days ago I read that former president Clinton publicly blasted the Bush administration for its environmental and energy related policies. The brief report that I read on line indicated that Clinton didn't claim that the world was running out of fossil fuels, and therefore we ought to conserve, as much as he stressed the negative impact of fossil fuels on global warming. Clinton also emphasized the economic advantages for the U.S. of developing alternative technologies. I think that Clinton's thoughts on the merits of developing alternative fuel technology are worth considering.

Republicans Pass an Energy Bill

The Wall Street Journal in an editorial, (sometime this past fall, I clipped out the article but failed to date it.) made the following statements:

"Shame! Shame!," cried Democrats, as GOP leaders kept a floor vote open for 48 minutes to pass an energy bill this month. They had the right line but the wrong target. The real shame is that even two hurricanes and $3.00 a gallon gasoline can't get some politicians to understand that the US. needs to increase its energy production.

If you want to know why you're heating and gasoline bills will be so high this winter, look no further than those who oppose this measure.

The real problem is government barriers to supply. This is why the last time the U.S. built a new oil refinery, Elvis was still impersonating himself.

That no Democrat voted in favor of this bill even amid these soaring prices suggests that President Bush and his fellow Republicans have been too defensive. They're letting themselves get pasted for supporting "industry" as if someone else is going to refine gasoline or drill for natural gas. They need to start telling voters that a major cause of high energy prices are limits on oil and gas exploration and production.

Do we want to pay the price to get off fossil fuel?

The Post Star, Sunday, October 2nd: "Alternative Energy Starting to Get Cheaper"

The good news is that nature has provided plenty of free energy to help you heat your home. The bad news is that it can cost a bundle to outfit a house with the systems to capture solar energy or geothermal energy.

According to the Environmental Protection Agency, geothermal heat pumps are considered the most efficient environmentally friendly and cost effective home-heating systems available. Here's the catch: The systems can cost about $7500, according to the Department of Energy.

The Wall Street Journal, Sunday, October 2, 2005, B6:

"Ethanol paper lights hot debate:" It began benignly enough as an assignment for the 15 freshmen in Tad Patzek's University of California-Berkeley college seminar class. But it soon mushroomed into something much larger. Patzek's scientific paper published in June touched raw nerves throughout the nation's energy and farm industries. Gas prices were climbing higher; Congress was in the midst of drafting an energy policy; and the article criticized one possible solution — making ethanol fuel from corn.

Patzek and David Pimentel, a Cornell scientist who had been a lone public voice against corn ethanol for more than 30 years, argued that corn ethanol did more harm than good. Growing corn, fertilizing the fields, transporting it to the factories and then to where it was needed took more energy than the resulting ethanol would ultimately generate, they said.

Detractors, including corn growers, federal government researchers, and other academics, took offense at Patzek's stance. They saw ethanol as an environment-friendly way of reducing the nation's dependence on foreign fossil fuels.

Opponents pointed to Patzek's oil industry days, saying he had ulterior motives.

In his personal life, Patzek thinks somewhat obsessively about how to be a good citizen to the environment. During the summer he rides his bike a few times a week to the University from his home in the Oakland hills. He drives his Nissan Altima only about $8000 miles a year. Walks on the beach were never just that; his wife and three children are always armed with bags to pick up trash. Insulating his house is an ongoing project, and he plans to try solar panels on the roof.

Patzek focused on energy for seven years at Shell Development Co. His contribution to society was to provide the fossil fuels it needed. By the time he left Shell his philosophical views had changed. "I realized that society will never have enough energy" Patzek said, "We are incurably addicts."

Patzek is now planning a center at the University of California-Berkeley, to take a careful look at all energy sources, including fossil fuels, biofuels like ethanol, solar, and nuclear. He wants scientists to devise a common framework for evaluating the advantages and disadvantages of each.

Patzek argues vehemently that corn alcohol cannot be a part of the energy solution. "However you look at this it is a rather inefficient way of concentrating solar energy into fuel," he said. It takes more energy to make ethanol than what is produced."

"There is no magic bullet to replace fossil fuels."

Meanwhile in China:

The Wall Street Journal, Tuesday. October 25, 2005 p A18:

Chinese Official Calls for Action on Air Pollution: Beijing-China's already-serious levels of pollution could quadruple over the next 15 years if its rapid increase in electricity consumption and automobile use continue unchecked, a senior Chinese environmental regulator warned.

Given the expected size of the economy and population in 2020, and extrapolating from current trends, "the pollution load will increase by four to five times," said Zhang Lijun, vice minister of the State Environmental Protection Administration, known as SEPA.

China is already the world's second-largest consumer of energy, behind the US. As its economy powers ahead with annual growth rates topping 9%, every year it puts about four million new vehicles on the road and adds nearly 30 gigawatts of power-generating capacity.

Mr. Beale said China could easily surpass the U.S. as the world's largest emitter of greenhouse gases, by 2025. (I feel relieved, don't you? 2025 is still quite a few years away.)

What is General Motors' Response?

The Wall Street Journal, October 31, 2005:

"General Motors Joins Rush to Make Hybrids in China" by Jathon Sapsford

General Motors Corp. became the latest auto maker to commit publicly to the production of gasoline-electric hybrid vehicles for the Chinese market, announcing plans to make hybrids in China by 2008. Working with its Chinese partner, SAIC Motor Corp., GM said it has set a goal of making a number of models with hybrid propulsion systems available for consumers.

By combining a conventional gasoline engine with electric motors, hybrids reduce harmful emissions and lower gas consumption. Both are compelling attributes amid mounting concerns over the environmental effect of greenhouse gases and worries about dependency on volatile oil-producing regions like the Middle East. Still, hybrids are expensive, and car makers furiously are trying to find ways to make the technology more affordable.

Many Chinese also are willing to spend for cutting edge technologies and high quality finish. Luxury brands have become a crucial part of any car company's China lineup. So Toyota, Volkswagen AG and now GM all intend to sell hybrid vehicles in China, in most cases in time for the 2008 Olympics. Also Shanghai will host the 2010 World's Fair Expo, by which time GM hopes to have built a fleet of hybrid buses through a program announced earlier.

Industry officials say Chinese authorities, mindful of a threat to the environment as increasing numbers of the country's 1.3 billion people buy cars, are seeking to promote the development of green technologies.

GM, the world's largest producer by volume, sold 308,722 vehicles in China in the

first half of 2005, an increase of 19% from a year earlier. Analysts expect that pace to continue in the second half. China was once a very lucrative car market for GM, having grabbed some of the dominance from Volkswagen.

Merry Christmas and Happy New Year

If you are depressed over the dominance of fossil fuel and our slow adaptation to alternative fuels, how can you expect to have a Merry Christmas and Happy New Year? Well, go out some night in the near future, look up at the stars (in many parts of the U.S. you can still see them), and sing, "Twinkle twinkle little star, How I wonder where you are? Up above the clouds so high, like a diamond in the sky!"

Some die for lack of a cause. Be thankful you have a cause to keep living for. Benedict Arnold gave up on the American cause, thinking that America's reliance on the French would lead to a French takeover of the world. He gave up too soon. So on behalf of Dave Goldstein, president of the EVA/DC, that band of fighters in our nation's capitol, we say, keep vigilant! We appreciate all that Dave and his brothers do in the fight for fossil energy free transportation. It is better to die for a worthwhile cause than to die waiting for Santa to come down the chimney.

Merry Christmas to all and to all a good night!

NEWS UPDATE

Hydrogen from the sun and landfill gas

Solar Hydrogen Energy Corporation (SHEC, Saskatoon, SK,), in conjunction with the University of Toronto Department of Chemical Engineering and Applied Chemistry has announced plans to deploy a solar hydrogen production station using methane extracted from landfills in the city of Regina, Saskatchewan.

The system feeds carbon dioxide (CO_2) and methane (CH_4) into a reactor heated by a solar mirror array where the gases react to form hydrogen gas (H_2) and carbon monoxide (CO). A water cooled iris dilates to control the amount of radiant energy directed to this reaction phase. The intermediate products feed into a water gas shift reactor (WGSR), controlled at near atmospheric pressure. The resulting gas stream contains H_2 and CO_2 and is saturated with water.

Energy input comes from a set of 30 solar arrays measuring 13 x 13 meters (40 x 40 feet) that heat the reactants to 850°C (1562°F); the installation is claimed to capable of generating 40,000 kg of hydrogen per year for a total station capacity of 1.2 million kg of hydrogen per year.

Cold cripples biofuel cars

A story by staff writer Manny Gonzales in the *Denver Post* for December 9 reported that subzero temperatures the previous morning had halted or slowed dozens of public school buses that run on bio-diesel fuel. The bio-diesel fuel — 80 percent petroleum and 20 percent virgin-stock soybean — gelled and clogged fuel filters. Running a diesel engine on 100 prevent vegetable oil generally requires that a small tank be installed to hold pure diesel fuel, which is used until the engine warms up, and prior to shutdown, because the vegetable oil tend to thicken when cold. Apparently even an 80/20 mix will do the same thing, if it gets cold enough.

Tax on hybrid cars proposed

An Associated Press story by Jim Abrams dated November 25 reported that a report commissioned by the U.S. Chamber of Commerce said the federal Highway Trust Fund is running out of money and needs new revenue sources. A number of proposals have been put forward to remedy the situation, including indexing the gasoline tax to the rate of inflation, but perhaps the dumbest was that owners of hybrids and other alternative fuel vehicles pay a vehicle fee, "the argument being that drivers should bear their fair share to fill the potholes and fix the bridges, regardless of how much or what kind of fuel they use."

In reality, the Commonwealth of Pennsylvania has on the books a regulation requiring drivers of electric cars to pay a special tax in lieu of gasoline taxes, but it is unenforced and uncollected.

The opposition lives

The Web site of the Greening Earth Society (a mouthpiece for the Western Fuel Asso-

ciation, a coalition of coal producers and its allies) seems to have disappeared, and Wikipedia lists it as a defunct organization. What seems to have taken its place is the Center for the Study of Carbon Dioxide & Global Change, whose Web site, CO_2 Science, works hard to debunk research linking atmospheric CO_2 levels and global warming.

Two other links from the WFA Web site, marked CO_2 and Climate and World Climate Report, come up as missing (not surprising, since its link points to the Greening Earth Society) , but a Google search turned up the World Climate Report at http://www.worldclimatereport.com. Put out by New Hope Environmental Services, which bills itself as an advocacy science consulting firm, the site claims to be "The Web's Longest-Running Climate Change Blog." In its own words, "This popular web log points out the weaknesses and outright fallacies in the science that is being touted as 'proof' of disastrous warming. It's the perfect antidote against those who argue for proposed changes to the Rio Climate Treaty, such as the Kyoto Protocol, which are aimed at limiting carbon emissions from the United States." An article in ExxonSecrets.org says that it is sponsored by the Greening Earth Society, but perhaps that has changed. We were unable to find any mention of WFA or the Greening Earth Society on the World Climate Report Web site, but it seems that Carbon, Inc. is still in business.

Fuel cells run on carbon

On November 14 the nonprofit research and development organization SRI International participated in a panel of distinguished researchers as part of the Direct Carbon Conversion Workshop at the 2005 Fuel Cell Seminar in Palm Springs. Workshop topics included market opportunities, technical challenges and leading R&D efforts. At the workshop, Drs. Balachov and Dubois introduce SRI's direct carbon fuel cell (DCFC) technology. DCFCs convert the chemical energy in coal directly into electricity without the need for gasification. SRI claims that the new technology produces electricity at a competitive cost from a variety of fuels including coal, coke, tar, biomass and organic waste, and is twice as fuel-efficient as a coal-fired power plant.

U.S. to lead in wind power?

A story by Alex Halperin in *Business Week* dated November 21 reports that a renewed tax credit may help the U.S. to become a key wind power market in the next few years, with General Electric "firmly entrenched as the domestic leader."

Since buying Enron Wind in 2002, the division's revenues have jumped from $500 million to an expected $2 billion-plus for 2005, "gains that have taken U.S. market share from the Danish world leader, Vestas Wind Systems, and other outfits."

The story quotes the Danish group BTM Consult that worldwide wind-energy capacity has grown an average of 15.8% annually for the past five years.

Taking a chance on (no) coal

A story by Steve Erwin in the London, ON *Free Press* reports that the province's plan to close its coal-fired generating plants will require that "every new generation project must be completed on time in the next two years to avoid power shortages all alternatives must be in time, on budget."

The provincial government is shutting down its four remaining coal-fired power plants over the next few years in an effort to reduce pollution; in the mean time eight renewable generation projects — including 300 megawatts of wind generation, 117 MW of gas-fired and 100 MW from nuclear unit upgrades — are scheduled to come on line. But if any of these is delayed the province could face severe energy shortages.

MN wind farm begins operations

A Reuters story dated November 30 reports that the 100-megawatt Trimont Area Wind Farm in Minnesota has entered commercial operation. The plant, belonging to Great River Energy, a not-for-profit power cooperative, has said the the project will generate enough electricity to supply about 29,000 homes, and brings the company closer to a commitment to obtain 10 percent of its energy from renewable sources by 2015. The plant consists of 67 GE wind turbines on about 8900 acres of farmland. "A coalition of 43 landowners in Jackson and Martin counties launched the wind farm in response to Great River's 2003 request for proposals."

COMING EVENTS

2006 North American International Auto Show
January 8-22, Detroit. Call 248-643-0250.

Hybrid Vehicle Technologies 2006 Symposium
February 1-2, San Diego, CA. Contact Nancy Eiben, SAE International, 724-772-8525, naneiben@sae.org.

Motor & Drive Systems Conference
February 15-16, Miami. Contact Jeremy Martin at jeremym@infowebcom.com.

Clean Heavy Duty Vehicle 2006
Feb 22-24, San Diego, CA. Contact: Susan Romeo or Monica Alcaraz, 626-744-5600, Srromeo@weststart.org or Malcaraz@weststart.org, www.weststart.org.

2006 SAE World Congress
April 3-7, 2006, Detroit, MI. Contact Nancy Lewis or Shawn Andreassi, both of SAE International at 724-772-4068 or pr@sae.org.

5th EVer EAA Chapters Conference
May 13-15, Chicago area, hosted by Fox Valley EAA, http://fveaa.org.

Fuel Cell 2006
June 6-7, Raleigh/Durham, NC. Contact Marsha Hanrahan, marshah@infowebcom.com.

Michelin Challenge Bibendum 2006
June 9-12, Paris. Contact at http://www.challengebibendum.com/challenge/front/affich.jsp?codeRubrique=45&lang=EN, or go to www.www.challengebibendum.com.

Convergence 2006
October 16-18, 20, Detroit, MI. Check www.sae.org.

MEETING SCHEDULE

Meetings are held in Room 35, Plymouth-Whitemarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m.

January 11

February 14

March 8

April 12

May 10

ADVERTISEMENTS

FOR SALE

1992 Dodge Colt with 18,000 miles. (Yes, you read correctly. There is minimal wear and tear on it.)

First-generation fully electric vehicle, converted for my aunt and uncle, Quakers who have been on the cutting-edge of the EV movement. The car is a fully-functional, fully-approved vehicle for use on all roads, with current PA inspection.

20 hp motor, multi-speed transmission (regular gear shift with no clutch)

Range of 20 miles. Goes up to 40 mph quite comfortably. Goes up to 60 easily, but has little power at higher speed, so highway driving is not recommended.

110-220 V Lester charger, off board. Using 110 takes about 5 hours for full charge Was purchased in 4/95 and has been repaired several times. You need to be able to park it fairly closely to an outlet.

Present Deka batteries were bought 9/03. #8C12 battery.wet (weighs 928 lbs) from East Penn Manufacturing Co. 12 V. six in back, two in front

No air conditioner (removed, since added weight)

Ideal buyer would be interested in tinkering, and in the technical aspects of the workings of a fully electric vehicle.

It is quirky, but any decent mechanic will be able to perform maintenance on most of it. Indeed, we have found that most mechanics have fun with it!

We are asking $2,500.

Interested? Tom Hoopes, Wayne, PA, 610-688-1522, eithercoe@comcast.net.