FOX VALLEY ELECTRIC AUTO ASSOCIATION NEWSLETTER FOR MARCH, 2002

NEXT MEETING: Friday, March 15 at 7:30 PM in the Triton INDUSTRIAL CAREERS BUILDING, (East Campus), Room 108

DISCUSSION TOPICS: 1. Seminar on June 1st. 2. Attending car rallies. 3. Open Topics.

MEMBERSHIP INFORMATION

Any person interested in electric cars is welcome to join the FVEAA. The cost for a full year's dues is $ 20 which will entitle members to receive our monthly Newsletter that contains useful information about electric car conversions, construction, news, policies, and events. Membership is not required to attend our meetings. Dues for NEW members joining in April will be $ 14.

To obtain info about the FVEAA you may contact either Past-President Ken Woods or President Shafer

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PRESEZ

The Directors and Webmaster have been doing a lot of work on the alternatives for the proposed FVEAA Seminar on June 1st at Triton. It involves trial use of advertising and our website to get 400 persons to attend and fill the auditorium. This is a real challenge. We will discuss and finally decide if we wish to proceed.

If the decision is a go, we will place a classified ad in a Chicago newspaper inviting interested parties to visit our website for program information and to register. We may also place a strategic ad in a local newspaper.

It has been suggested that there is another way to make our activities better known would be to attend car rallies. These are held at many places during the summer and are attended by thousands. There is no charge. Net Gain is willing to have *Bad Amplitude* at some rallies and it would be a unique attraction. We will discuss this idea.

It has been a long time since we have time available for open topics where we can talk about whatever topics are brought up. This should be useful to our new members.

This issue of the newsletter contains the text of the battery discussion presented at the last meetings for the benefit of members not at the February meeting.

The VCR player was not in our meeting room last month. We will try again to show the video of Doug Mather's appearance on Channel 7s program, "Someone You Should Know".

BILL

MINUTES OF THE FEBRUARY 15th MEETING

The meeting at Triton was called to order by President Shafer at 7:35 PM. Fifteen members and four guests attended. The minutes of the January meeting were approved. Treasurer Corel's report that we have $ 2,709.81 in the Checking account and $3,049.11 in the savings account was accepted. He also said the bank card signatures have been updated.

Member Doug Mather reported on his interview for Channel 7. The taping required two hours which was edited to 7 minutes for broadcast. Several guests reported seeing the program. Doug emphasized that his main point was that his converted Fiero is a useful commuting vehicle and uses solar energy from his backyard solar array.

Member Kevin Zak reported that although the Dragster, *Bad Amplitude*, was at the World of Wheels exhibition there were no cancellations that would have allowed the *Green Machine* to be there. The vehicle was ready, thanks to detailing work by Members Karl Klein and John Emde and the strategic positioning of the truck at Emde's shop by Ray Oviyach. He also prepared a bed-sized poster display from the pictures and tape made of the conversion process that should be useful in the future. Kevin was disappointed that there was no media coverage of the show. John Emde made stanchions from battery cases filled with concrete and using PVC tubing for future displays.

Future exhibit opportunities were discussed. President Shafer presented his idea for a 2-hour June 1st seminar at Triton College. It would include the topics of EV use, the conversion process, EV components, and energy sources. The FVEAA would rent the 400-seat auditorium at Triton. Program costs would total about $ 1,500. He proposed a $ 5 fee at the door to cover the cost of rental, advertising, and a ZAPPY electric scooter as a door prize. The challenge is how to fill those seats. Member's converted cars would be exhibited in the parking lot, or in the Triton Shop in case of rain.

The proposal was discussed. The members agreed that President Shafer should work with the FVEAA Board and continue work on the proposal. A final decision will be made at the March meeting.

President Shafer reported on the membership renewal status. At then end of the fiscal year the FVEAA had 62 paid members. Current membership is 48 as of Feb.15th. We have several new members who joined this year. There are enough memberships to sustain our operations.

Webmaster Doug Mather reported on improvement to our website. It includes an interactive method for establishing additional links. Doug reviews each submission and determines that a proposed new linkage is consistent with the purposes of the FVEAA. He also stated that members working on conversions should submit pictures and data about their project for posting on the website.

President Shafer presented a tutorial on EV batteries.

Guests were asked to introduce themselves and discuss their interest in electric cars.

Kevin Zak announced Net Gain has Honda *Insight* that will be converted into a racing car this spring.

The meeting was adjourned at 10:15 PM

Submitted by Todd Dore.
Substituting for Secretary Tim Moore.

From other EV Newsletters and articles affecting EV's

The February DEVC Newsletter from the Denver group noted that Net Gain had their Dragster at the Milwaukee World of Wheels (WOW) where it was a leading attraction. Ed. Note – they also exhibited the vehicle at the Chicago WOW where it won prizes. There was also an article on the nickel hydrogen battery being developed by ElectraStar in Pittsfield MA for hybrid use. Hydrogen is stored in a nickel hydride. It claims a power density of 1.5-2.0 kW per kilogram and a specific energy of 150 kWh/kg, about triple the rating for a lead-acid battery.

They report that **Emotion Mobility** will supply electric drive systems for conversion of the European SMART car in Atlanta. They expect to deliver 1100 cars this year followed by 2500 annually. The SMART is a 2-seat car to be used mainly for driving from home to a commuter train station.

EEVC from the Eastern group had information about an electric motor for the Segway people transporter. It was developed and built by Pacific Scientific in Rockford, IL. It is a brushless dc device using a sensor to that provides precision feedback to the drive electronics without a traditional resolver or encoder. The stator has redundant windings, effectively providing two motors in one shell. Each can operate independently in case of a single failure. Motor size is reduced compared to other designs. During manufacturing a proprietary injection molding process is used to encapsulate the windings in one step. The motor has 40% more torque per unit of volume compared to conventional designs.

A new electric scooter was featured in the February issue. It is made by eGO Vehicles in Providence RI. The scooter has a 20-mph top speed and a 15-mile range or a 15-mph speed and 25 mile range. The scooter resembles a 1950's look of a moped. It weighs 98 pounds and will sell for $ 1400.

It appears the group will become a chapter of the National EAA.

It's catch-up time for Newsletters from **VEVA**, **the Vancouver Group.** Somehow three issues got temporarily lost in the confusion of my computer room.

In the November Newsletter they have an extensive article about the ZEBRA battery. A group in South Africa invented the battery in the 1970s. It uses a sodium anode, a beta aluminum solid electrolyte, together with a liquid sodium-aluminum chloride electrolyte, and cathode composed of partially chlorinated iron and nickel. When discharging, sodium and chlorine form sodium chloride (salt) and pure sodium while the iron effectively forms a parallel second nickel-iron cell that is normally kept charged by the reactions. When the cell voltage is reduced below 2.35 volts (the iron cell potential) the cell discharges. The result of all this is a battery whose pulse power is almost independent of the state-of-charge.

A ZEBRA cell can tolerate an overcharge up to 10% of rated capacity. It has a coulombic efficiency of nearly 100%. The cell operates at 250^0 C. If the case is ruptured in a crash the free sodium is rapidly transformed into a mixture of salt and aluminum metal.

The battery has a number of advantages: 1) Performance is independent of ambient temperature. 2) The battery heat capacity can provide cabin warming, 3) The amount of nickel used is very low compared to a nickel-iron or a NiMH battery. 4) It has a cycle life of over 2500. 5) It will function down to a 100% depth of discharge with little loss of life.

From other EV Newsletters and articles affecting EV's - Concluded

A commercially available ZEBRA battery sold by MSS-DEA in Stabil, Switzerland has a 17.5 kWh energy rating, weighs 195 kg (430 lbs) had has a voltage rating of 278 volts. It is 30" x 21" x 12". It has an expected cycle life of 100,000. Last year they produced 2000 units. Cost is the major disadvantage. The unit described above costs $ $14,634 and the charger another $ 1,099. For comparison, a 276 volt pack of Optima YT batteries would cost $ 2,875 but three sets would be required to have equal cycle life.

The December Newsletter contained mostly items of local interest. The February issue had an article on reviving a dead (sulfated) EV battery. The process requires a low-current, high-voltage source that is connected for DAYS. To revive a 13-battery series connected bank it recommends using a bridge rectifier on a 120-volt ac supply circuit connected in series to a 100-watt incandescent lamp that will provide a charging current of about 1 amp. Eventually the batteries may "wake up" and it is time to connect them to the usual charging source.

The Jan. – Feb issue of EV Circuit from the Ottawa Group had reports about successful EV ventures; Randy Holmquist's Canadian Electric Vehicles has built and sold a number of their conversions. These use a separately excited motor that allows simple regenerative braking and reverse without contactor switching. They also note that the 1992 Energy Policy Act that requires EVs in federal vehicle fleets is being violated. The dereliction was challenged in a lawsuit filed in Federal Court on January 8th.

The March issue of **Car & Driver** had an informative article by Patrick Bedard, *"Gas is good, gas is great, but gasoline isn't forever"*. He cites a comprehensive study that considered 75 different fuels, from gasoline, hydrogen, and biofuels derived from enzyme-produced alcohol. It also examined fifteen powertrain types. The study started with "a hole in the ground" and calculates energy losses and emissions along the fuel trail from extraction, to transportation, refining, storage and ending with consumption. **It excluded cars running on grid-derived electricity.**

The most-immediate way to reduce consumption was the direct-injected diesel. A diesel-hybrid was found to reduce energy requirements by 47% with the hybrid concept contributing 25% of that.

Ethanol made it to the finals. Ethanol derived from corn requires consideration of the fuel used for farming operations, about 1.5 billion gallons annually. The maximum ethanol annual production would be limited to about 3 billion gallons without disrupting the feed and food markets according to the Department of Agriculture.

Gasoline derived from petroleum requires the least energy per Btu delivered to the tank. Electrolytically produced hydrogen requires the most.

Storing a fuel by pressurization or by liquefaction consumes an enormous amount of energy. This is a barrier to both hydrogen and natural gas use.

Natural gas releases a considerable quantity of CO_2. The natural gas supply in North America is too limited to serve a significant portion of transportation fuels. The recent building of gas-fired power plants will consume enormous quantities of gas for electricity production.

His conclusions: Hybridization could bump fuel efficiency by 15%. Changing to diesels adds far more. Both are realistic technologies. **Fuel cells are not.**