

**Fox Valley Electric Auto Association
1522 Clinton Place
River Forest, IL 60305-1208**

Address Correction Requested

NEXT MEETING: Friday, May 15 at 7:30 PM in Room K-161 at The College of Dupage SW Corner of 22nd Street & Lambert Road in Glen Ellen.

DISCUSSION TOPICS - 1. Report on Earth Day Events. 2. Status of Ranger purchase. 3. Member's reports on the progress of their conversions and upgrades 4. Discuss a possible summer event.

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 the member to receive our monthly Newsletter that contains useful information about electric car components, construction, policies and events. Dues for new members joining in April will be \$ 12.

To obtain information about the FVEAA, you may contact either President Woods or Vice President Shafer:

President - Ken Woods
1264 Harvest Court
Naperville, IL 60564-8956
(630) 420-1118
E-mail Casa Zeus2@aol.com

Vice President & Editor - Bill Shafer
1522 Clinton Place
River Forest, IL 60305-1208
(708) 771-5202
E-mail electric_bill@compuserve.com

May, 1998 PRESSEZ

The FVEAA participated in three Earth Day events. We will have a short report.

Member Fred Kitch will give us a report on the progress of his Ford electric Ranger purchase.

A number of conversions or upgrades are either in progress or have been recently completed. Members are invited to share their experiences.

Discussion of a possible summer event. The last was held at COD in August, 1993. Previous events were held at Triton College, Argonne, Fermi Lab, and Fox Valley Shopping center.

Ken

APRIL 17, 1998 MEETING MINUTES

The April 17th meeting at the College of Du Page was called to order by President Woods at 7:47 p.m. Ten members and two guests attended. New Member Joanne Anderson of Downers Grove was welcomed. She has a custom-built electric bicycle.

The minutes of the previous meeting were approved as published.

Treasurer Corel reported \$ 3027.51 in the checking account and no change in the savings account. His report was approved. A question was raised about maintaining separate checking and savings accounts in view of the low rate of return on the latter.

A video of the Clean Fuel Fleet Program (CFFP) at Argonne Lab was recorded and edited by Member John Emde was shown. This was followed by a discussion by members attending.

The 6-county Chicago Metropolitan Area has been designated by the EPA to be in non-attainment because the number of ozone level events exceeds the allowed number. The Clean Air Act Amendments of 1990 requires the State of Illinois (35 ILL Adm. Code 241) to carry out a CFFP. The rules require fleet owners/operators of ten or more vehicles to purchase a specified percentage of new vehicles that meet the Federal low emission certification standard.

Eligible clean fuels are:

Ethanol	Methanol	Natural Gas
Propane	Electricity	Hydrogen

Gasoline or Diesel vehicles certified as a Low Emission (LEV), Ultra Low Emission (ULEV) or Zero Emission (ZEV).

Beginning in 1999, 30% of new vehicle purchases must meet CFFP requirements. This rises to 50% in 2000 and 70% after 2001. There are 4600 fleets consisting of 375,000 vehicles that will be affected.

When asked about penalties for non-compliance, Darwin Burkhart, an Environmental Protection Specialist with the State EPA stated the general provisions of the State EPA enforcement may apply. Penalties will be decided on a case-by-case basis and depend on the nature of the violation.

Additional information about CFFP is on the Internet at www.erc.uic.edu/cleancities

Member Frank Delmonico described conversion several years ago of his motor home to propane fuel. Fuel cost was only thirty five cents/gallon because no road fuel taxes were collected.

Member Jerry Mitchell reported on his plans for participation in the Earth Day event in Glenview tomorrow. Member Ed Meyer described his plans for the Bolingbrook observance on April 25th.

The meeting was adjourned at 10:35PM.

Submitted by:
William H. Shafer
Secretary by default

RECENT ARTICLES ABOUT ELECTRIC VEHICLES

Ford takes next step to fuel-cell car. Chicago Tribune 4/12/98. Ford and Mercedes have signed contracts with Ballard Power Systems of Canada to build commercially fuel cell powered vehicles by 2005. Mercedes will hold a 20% stake and Ford will have 15% of the alliance that has \$ 704 million has been invested. Fuel cells will be supplied by Ballard. Ford has also formed a new company that will develop a new drive train. The new firm is 21% owned by Ballard, 17% by Mercedes and the rest owned by Ford that amounts to \$ 420 million in cash, technology, and assets. Ford also has a 1/3 interest in Mazda who will also participate in the program.

GM juggles truck production to meet fuel-economy rules. Chicago Tribune 5/5/98. GM is changing its 1998 production schedule to phase out some low-mileage trucks that jeopardize compliance with CAFE requirements. GM's 1996 truck average was just 0.2 below the standard of 21.1 mpg. One move is to reduce production of V-8 engines and increase the number of 4-cylinder engines installed in S-10 pickups. Chrysler and Ford plan no change because they offer trucks powered by ethanol, compressed natural gas, propane, or batteries that provide mileage credits.

Ford out to color our world environmentally. Chicago Tribune 4/5/98. Auto buyers today are more interested in lean and mean cars than in clean and green vehicles. Ford is out to change this attitude with alternative fueled vehicles. Ford now offers 11 alternative-fueled vehicles. The new Ranger electric pickup truck has 39 batteries that provide a 50-mile single-charge range. The battery weight makes driving the pickup feel like you have a good part of the Sears Tower strapped to the vehicle. The new Contour can run on either gasoline or compressed natural gas (CNG). A Taurus can be purchased that runs on either gasoline or a mixture of 85% ethanol and 15% gasoline (M85 fuel). The 98 Crown Victoria is available using CNG. Alternative fueled vehicles have a price premium of \$ 200 to \$ 4000.

Golf carts may putter down city streets. Chicago Sun-Times 4/12/98. A retirement community proposed by Del Webb in western suburban Huntely may allow golf carts to use the streets under a new law recently introduced in the Illinois Legislature. This is the pattern in Del Webb's Sun City development in Arizona, California, South Carolina, and Texas. Sun City AZ has 30 thousand residents and 15 thousand carts, mostly electric. Many new residents there who own two cars sell one and buy an electric golf cart for internal transportation in the specially-designed community.

Clean Machines. Chicago Sun-Times 2/22/98. Green machine now identifies a vehicle that makes little or no pollution and is very efficient in using energy. Four typical offerings are the Ford Ranger (\$ 33,000), the Toyota Prius hybrid (\$42,000), the Honda JV-X conceptcar, and GM's diesel-electric hybrid under development.

RECENT ARTICLES ABOUT ELECTRIC VEHICLES - Concluded

Automakers seeking alternative ways to power cars. Columbus (OH) Dispatch. 2/27/98.

Car manufacturers are struggling to define what will power cars 20 years from now. There are two major concerns: 1) Petroleum availability and 2) Atmosphere warming. The first item is addressed in the following article. The latter is the result of burning oil or coal that emits carbon monoxide or dioxide. This can be reduced only by improving vehicle the fuel economy of cars. Car manufacturers are pursuing several choices.

Preventing the Next Oil Crunch. Scientific American, March 1998, pp78-95. In four articles, in this issue of the magazine, the various aspects of oil production are reported. Reading these is a **must** for anyone interested in the subject.

The first article, *The End of Cheap Oil* analyzes the probable store of petroleum. In 1973 gasoline prices tripled and in 1979 they doubled due to production restriction by a consortium of oil producing nations. These conditions are not likely to be repeated due to development of oil fields outside the control of the Mideast oil-producing states.

The authors develop an estimate of 850 billion barrels (Gbo) of petroleum available. They note that reserves reported by oil producers, countries with oil deposits, and others are overly-optimistic. Current annual production of 26 Gbo will rise to an estimated 40 Gbo by 2020.

In 1956, geologist M. King Hubbert found that oil production in any field peaks when half of the amount is extracted. On a global basis the halfway point will be reached in 2000. After the peak, production is on the declining side of a bell shaped curve. The switch from increasing to declining annual production is expected to cause a worldwide increase in oil price.

The second article, *Mining for Oil* covers the extraction of oil from tar sands. Petroleum from this source requires both mining and conversion process. At present, the petroleum from the Canadian Athabaska source is more costly than liquid oil derived from oil wells.

The third article, *Oil Production in the 21st Century* describes extraction of oil from deposits located in ever-deeper ocean locations and drilling techniques that increase the amount of oil recovered from fields by 20%. Some of these techniques increase production costs by 10-15%.

The final article, *Liquid Fuels from Natural Gas* describes the techniques that convert gas to an oil product. In the first - known as steam reforming - methane is heated, combined with steam, and passed over a catalyst that breaks the bonds to produce a mixture of hydrogen and carbon monoxide. The mixture is called SYNGAS. Coal and atmospheric oxygen is the source of methane used in the second method, known as the Fischer-Tropsch process. Petroleum produced by these two means is generally 10% higher in cost than usual sources.

FROM OTHER EV NEWSLETTERS

EEVC, the Eastern Club, in their April Newsletter contains an update on the Cinnamonsen High School project to build an electric car to enter in this year's Tour de Sol. The converted 86 Ford Escort. In a test drive the car went 17 miles until it had a definite loss of power. They plan to replace the batteries with a set of Trojan T-145 batteries that will deliver 75 amps for 145 minutes. The suspension had to be modified to handle the extra 600 pounds. The school is being helped by several commercial firms. The issue also has a neat photo of an electrified 1984 Fiero owned by Rod Hower. It has a 120volt NiCad battery pack, a 500-amps IGBT controller and a 30 hp GE motor. Rod is a member of the AOL discussion group, EV Partners, under the screen name RODHOWER.

Global EV News April Executive Issue reported than more than 50 teams participated in the March 6-8 event in Phoenix. The Indy-Style, battery powered race was won by Bowling Green University in Bowling Green Ohio. There were 22 cars entered in the high school competition won by Kearny High School, finishing first by just 2.7 seconds.

This year's Future Car competition will be June 4-10. The objective is to demonstrate a 4-passenger family sedan that will get an equivalent of 60 mpg.

The 1998 Tour de Sol will be run May 9-15, starting in New York City and ending in Washington DC. Among the vehicles at the event will be the PRIUS.

The issue also has an extensive article about Toyota's *Prius*. Production has been increased to 1200 per month in response to public acceptance of the \$ 17,000 vehicle. About 60% of Japanese purchasers are the general public; company buyers account for 40%. Personal buyers in their 30's make up 35%, 25% are 30-40, and 40% are in their 50's. About half the buyers are moving from a larger car.

The SEVA (Sacramento) April newsletter contains an account of a FIERO fire that was caused by a wiring fault in the charger. The car had been on charge for two days when a popping sound was heard coming from the garage. When the door was opened a billowing cloud of smoke erupted. The car was totaled and about \$ 20,000 of smoke damage to the house resulted. Pictures of the damage have been posted on the NET at: www.quicknet.com/~rvt.htm

We welcome the addition of *Electrifying Times* to our lineup. This is a quarterly publication available for \$ 15 from Electrifying Times, 63600 Deschutes Road in Bend, OR 97701. The winter issue lead story is how the Big 3 are shying away from all-battery EV's due to the public perception of their limited range. Hybrids seem to be gaining ascendancy over expensive NiMH and other exotic batteries.

There is also an article describing a lithium-polymer (LP) battery development sponsored by the US Advanced Battery Consortium at Argonne Lab, and Hydro-Quebec. The contract is for an estimated \$ 30 million. The LP battery goal is an energy density of 260 Wh/kg, about five times that of present batteries.

The lead article of the Winter, 1998 issue of **Future Drive**, the Argonne Lab publication about DOE-sponsored competitions, describes the testing program for ethanol-fuel cars at the General Motors Milford proving ground. These cars are Chevy Lumina's modified to run on E85 fuel (85% ethanol and 15% gasoline).

The University of Tennessee entry in the 1998 PNGV competition will use a planetary gear train in their hybrid car. The compressed natural gas fuel for the hybrid engine will be retained.

Electrathon competition was the subject of an article. This involves high school groups that build an electric car driven by a 1-3hp electric motor and a maximum 64 pound lead-acid battery. The winning car is the one traveling the greatest distance on an oval track in a one-hour time. The present competition record is 38.39 miles held by Orion (MI) High School.

VEVA, the Vancouver group in their April issue has an article about the race car built over a 3-year period by Grades 11 and 12 French Immersion students. Eight women making up the team have been together since the primary grades. They started by stripping a Formula Ford 1600 chassis and making the conversion to electric.

ARGONNE LAB NOW HAS AN ADVANCED POWERTRAIN TEST FACILITY

The Advanced Powertrain Test Facility will evaluate the efficiency and effectiveness of hybrid electric vehicle (HEV) component and systems designs. Considered a strong contender to replace conventional and all-electric vehicles, HEVs are propelled by two energy sources usually an electric motor and an internal combustion engine powered by gasoline or an alternative fuel.

The test facility features a 190-horsepower motoring DC engine dynamometer and an Argonne-designed computer control system that simulates driving under a wide range of conditions. Exhaust emissions equipment is now being added to the facility, enabling testing and development of both the efficiency enhancing and exhaust emissions reduction potentials of HEVs. By the end of the year, a chassis dynamometer will be installed to test and evaluate current production HEVs.

The test facility is the newest addition to Argonne's Transportation Technology Research and Development Center. It was dedicated one year after the opening of the Argonne Diesel Engine Test facility in cooperation with the Electro-Motive Division of General Motors in 1996.

With more than 200 different programs in basic and applied research, Argonne is one of the nations largest federally funded scientific laboratories. Argonne is operated by the University of Chicago for the U.S. Department of Energy.

For more information, contact Evelyn Brown (630/252-5510 or eabrown@anl.gov) at Argonne.

BASIC FACTORS IN BUILDING AND UPGRADING AN ELECTRIC CAR

In last month's Newsletter three options for upgrading my 1980 Mazda RX-7 (converted in 1991) were presented. Readers were invited to submit their recommendation. A summary of the advice received was promised in the May Newsletter.

To refresh your memory, the three alternatives offered were:

- Option 1. Replace twelve 6-volt Trojan T-105 batteries and retain the 72 volt system.
- Option 2. Replace the batteries with twelve 8-volt Trojan T-875 batteries and increase the system voltage to 96 volts. This requires replacing the controller, dc-dc converter, and battery charger.
- Option 3. Replace the batteries with either a single 96-volt string of Optima "Red Top" 12-volt sealed batteries with a sacrifice of range and less weight, or two parallel strings of these batteries that would retain range and weight.

All responses recommended Option 1. The reason stated was I have a vehicle that meets my driving needs. Why spend the extra money? This would be a rational engineering choice.

I chose Option 2. Taking advantage of the newly-available 8-volt battery that was offered at a price premium of only \$ 10 per battery over the 6-volt unit price was too attractive to pass up. It will increase the top speed of the car by a calculated 24%, which is not a factor because of the way the car is driven. The 33% increase in system voltage will reduce the current required at a given speed and lower the rate of battery discharge.

I plan a series of tests to investigate the effect of each change. For the past two weeks I have driven the car with nine 8-volt units. This reduced the car's weight by 186 pounds. There was no discernable change in acceleration but I have recorded a reduction in the kWh/mile consumption from 0.750 to 0.530. This is likely due to the better charge-acceptance characteristics of the new batteries, although weight reduction may be a factor.

The second step will be to replace the controller. No performance change is anticipated. After this three more batteries will be installed but not connected see how the added weight affects operation. The final configuration will be the 96 volt system with a new battery charger and dc-dc converter.

There are two lessons that will be useful to someone just starting a conversion:

1. Do it right the first time. Upgrading can be expensive.
2. Choose the highest-voltage system that can be accommodated by the vehicle. Total weight must be equally distributed and not exceed the vehicle's maximum GVW.

