

F.V.E.A.A. NEWSLETTER

May 1993

President

Kenneth Woods
1264 Harvest Ct.
Naperville, IL 60565
(708) 420-1118

Vice President

Kenneth Woods
1264 Harvest Ct.
Naperville, IL 60565
(708) 420-1118

Secretary

William H. Shafer
308 South East Dr.
Oak Park, IL 60302
(708) 383-0186

Treasurer

Dale Corel
595 Gates Head North
Elk Grove Village,
Illinois, 60007
(708) 228-5952

Editor

Douglas F. Marsh
336 McKee St.
Batavia, IL 60510
(708) 879-8089

Director

John Emde
6542 Fairmount Ave.
Downers Grove,
Illinois 60516
(708) 968-2692

NEXT MEETING

May 21st @ 7:30pm

College of Dupage

Student Resource Center

Room 1046

Use Lambert Rd. Entrance, Lot 7 at the Southeast corner of 22nd & Lambert

Nonmembers are always welcome!

Director

John Stockberger
2S643 Nelson Lake Rd.
Batavia, IL 60510
(708) 879-0207

MEMBERSHIP INFORMATION

Membership to the Fox Valley Electric Auto Association is open to the public. Anyone interested in electric vehicles or electric transportation are encouraged to join. The cost to join is \$15 per year from November to November. If joining in the middle of the year the cost is \$1.25 for every month remaining til November of that year. The cost for new members joining is 75.

Fox Valley Electric Auto Association

336 McKee Street
Batavia, IL 60510

First Class

**ADDRESS
CORRECTION
REQUESTED**

PRESEZ

The next meeting will include planning for our Symposium and electric car demonstration at the College of DuPage.

The suggested theme "Drive an electric car: Save Money".

The Illinois Solar Energy Association at their May 11, 1993 board of directors meeting agreed to co-sponsor this event as they have the past two events at Triton college and Argonne National Laboratory.

I plan to attend the final day of the fourth annual Tour de Sol race and electric cars in Burlington, VT. on Saturday, May 29. This is the race sponsored by the Northeast Sustainable Energy Association.

Ken Woods

MINUTES OF APRIL 16, 1993 FVEAA MEETING

The meeting in the Student Resource Center of the College of DuPage was called to order by President Marsh at 7:40PM. There were 20 members and one guest present.

The membership approved Treasure Corel's report which shows \$ 1257.80 in the checking and \$ 2055.26 in the savings accounts.

The February minutes were approved. The March meeting minutes were approved with a further correction by Member Clark.

President Marsh announced the death last week of Member John Ahern. Member Paul Harris was voted to be the successor Registered Agent for the FVEAA, a position Mr Ahern held.

Member Dan Sartain from Bay City Michigan sent a letter reporting the successful completion of his Yugo conversion project.

President Marsh listed the following future EV events:

- a. Earth Day Anniversary observance in Aurora, April 21.
- b. Annual American Tour de Sol in Boston, May 23-29.
- c. The Amherst Alternative Energy Fair, June 21.
- d. Dallas-Twin Cities 1993 Sunrace begins June 26.
President Marsh will attend.

President Marsh noted the following EV supplier information:

- a. Electro-Automotive Rabbit conversion kit for about \$ 6k.
- b. Green Motor Works in N Hollywood offers a Kiewet, the only crash-tested EV, for \$ 12K.
- c. EVs offered for sale in the latest Earth Options catalog include a Counselor for \$ 75k and a utility van.

Member Emde furnished handouts covering technical data and an analysis of the BAT 450-mile, single-charge distance run. There was a brief discussion of the FVEAA Newsletter back issues.

Member Frank Delmonico has located a supplier willing to sell Exide EV-107 batteries to FVEAA members for \$ 44.95 each, delivered to a site. A trade-in battery is required & will be picked up at the same time as delivery. Anyone interested should call him at (708) 544-6312 for details.

Member Kranovitch is investigating the new Briggs & Stratton Vanguard engine for hybrid applications. This reportedly will be much quieter than previous engines.

Member Clark inquired about the status of obtaining a complimentary copy of the EV book, SOLO. He noted it is generally available now in many public libraries.

Due to the pressure of his responsibility for Marsh Industries after Richard Marsh's accident, President Doug Marsh announced his immediate resignation as President. Vice President Woods will assume the Office in accordance with the ByLaws. Doug will continue as Newsletter Editor with the assistance of Member Emde as publisher. New President Woods presented a status report of the FVEAA entry in the American Infrastructure & the EV Competition. The entry was mailed August 8th. Judging will be completed and award announcements made at a May 11 dinner meeting in Washington.

The entry preparation task force recommended that the FVEAA pay expenses associated with the entry, subject to Board of Directors approval, and that after expense payment, any prize money received by the FVEAA shall be split with 80% distributed equally to the 5 principal authors and 20% to the FVEAA for future expenses of the Organization. A motion to adopt this recommendation was made, seconded, and unanimously approved by the membership.

Member Ketchick asked about storing batteries on a concrete floor. According to CAR TALK, a weekly program at 12:00 Saturdays over WBEZ (97.1 FM) in Chicago, this can result in shortened battery life. The colder concrete floor can cause a moisture condensation on the battery exterior surface and subsequent self-discharge & possible sulfation.

President Woods will make a telephone survey attempting to secure a member to serve as Event Chairman for the proposed FVEAA EV Forum. The delay in getting someone to assume this job will probably delay this until August.

The second half of the Electro-Automotive Video on EV conversion, furnished by Member Kraft, was viewed.

The meeting was adjourned at 10:30PM.

Submitted by

Secretary
William Shafer

May 1993 Want Ads

1981 VW DIESEL RABBIT AVAILABLE FOR CONVERSION

Guest Richard Ray, an architect and member of the Illinois Solar Energy Association announced at the April meeting that he had a 1981 diesel VW Rabbit with over 100k miles that developed a bad engine which would require about \$ 3000 to replace. He is willing to sell the car for \$ 150 or donate it to a FVEAA member willing to undertake a conversion project. Anyone interested should call him soon at (708) 447-1899.

This is the second VW diesel Rabbit that developed engine trouble which has been brought to the attention of the FVEAA. Wonder if there is a failure pattern ?

WANTED

A used electric corded or cordless push mower. Preferable working. Contact Doug Marsh (708) 879-8008

FOR SALE

Rack mounting computer power supplies. Outputs 12 & -12VDC and +5VDC. Various amperage rating from 30 to 90 amps. Several different manufacturers. All perfect working condition, some brand new never used. Some with battery back up. Contact Doug Marsh, (708) 879-8008.

Continued.....

FOR SALE

22" Lawn Mower
Excellent Condition
Ward's brand
\$65.00 Rich Ness
(312) 889-7757

FOR SALE

I have several 1976 TRIUMPH TR 7's 2 Running gas vehicles, one interior ok, one not. 2 parts, one was an automatic. 1 interior ok, 1 gutted. Make offer.
Tom Cartwright
1104 Douglas Terrace
Dixon, IL 61021
(815) 288-1300

FOR SALE

Muffin Fans 12 VDC Brushless
7 blade 2-3/8" sq. x 1" thick
15 C.F.M. Use for computers,
power supplies, battery chargers,
controllers, ventilate battery box.
\$4.00 ea. 10 or more \$3.50 ea.
John Emde (708) 968-2692

FOR SALE

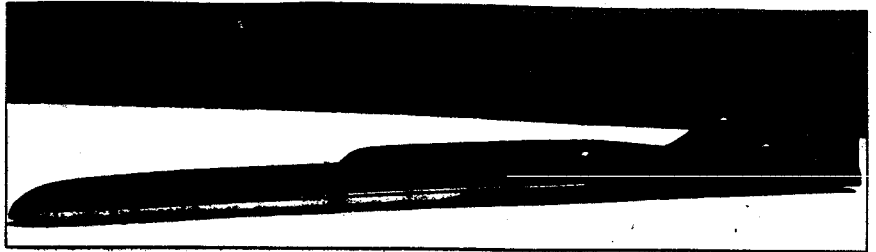
3 foot 19" standard computer racks
with casters. Perfect for mounting
test equipment. \$15.00 each
Doug Marsh (708) 879-8089

FOR SALE

Mechanix Illustrated Electric
Town Car by owner/builder
George Krajnovich
1982 Electric car with plans
and tow bar \$2900.00
2500 Watt hybrid \$450.00
Extra 8 HP Baldor motor
with adapters \$400.00
(708) 834-0370

WHAT EVER HAPPENED TO THIS ?

ELECTRIC RECORD RUN



For perhaps the first time, an electric-powered car will directly challenge conventional race cars. A team of Arizona engineers hopes to break the land-speed record for wheel-driven vehicles, set at 409.277 mph 25 years ago by the Summer Brothers' four-engined Gold-rod.

In its quest for 450 mph or more, the electric car will have a big advantage over conventional land-speed record cars: significantly smaller frontal area and, thus, significantly lower horsepower needs. "Our frontal area is limited by the shape of the driver, not the shape of the engines," said program leader Chuck Lemme.

100 AUGUST 1991

MOTOR TREND

Power for the vehicle's four solid-state brushless DC motors will be stored in spiral-wound lead acid batteries. The motors, placed one at each wheel, have a "continuous duty" rating of just 20 horsepower. However, by boosting the voltage to 320 and pumping in 10 times the standard current, they'll produce a total of 600 horsepower for the 70-second run. "If you don't break the record in 70 seconds, you're not going to do it," said Lemme.

As with conventional racing teams, the electric record team's biggest hurdle will be funding. "We need a corporate sponsor who wants gobs of publicity," said Lemme.

A Library is being set up at the meetings so all club members can have the opportunity to check out - for a month - collections of the FVEAA past newsletters and other Electric Car Clubs newsletters and books of interest. If you have something interesting to donate, feel free to do so. We are also looking for someone to act as librarian.

3

The Electric Vehicle and the American Community:

A NATIONAL PLANNING AND DESIGN COMPETITION

Entry by:
The Fox Valley Electric Auto Association

Principal Authors:

Steven F. Clark, EV Owner
Richard W. Johnson, P.E.
William H. Shafer, Township Assessor
Timothy A. Stevens, Test Engineer
Kenneth R. Woods, A.I.A.

With the cooperation of the Village of Downers Grove Staff

EV INFRASTRUCTURE DESIGN COMPETITION

FRAMEWORK

I. TARGET COMMUNITY

We have selected the Village of Downers Grove, IL (Village) as the subject of our entry. It is representative of a number of small suburban communities in the Chicago area that were largely developed in the last half of this century, even though it was initially settled in 1832. The 1990 Census counted 46,858 persons living in the 17 square miles of the Village. The 1990 median family income was \$47,000. Exhibit A on the Presentation Board shows its location in the Chicago Metropolitan area.

A commuter railroad route to Chicago transects the center of the Village. Each weekday there are 4264 boardings from 3 stations. The Village has 12 parking lots having 1192 permit parking spaces as well as other parking facilities (Exhibit B).

There are 1800 business in the Village. These include retail stores, offices, service establishments, and some light industrial.

Village government is a council-manager form. A manager and professional staff is responsible for day-to-day operations with policy being determined by the Council. Already underway is a planning process to update the 30-year old comprehensive plan. The Council appears to be interested in the future place that electric vehicles (EVs) may have and what future infrastructure should be planned.

II. OBJECTIVES

We have identified 6 objectives that EVs will help accomplish:

1. Provide short trip driving energy efficiency.
2. Reduce costs of short trip driving.
3. Reduce dependency on gasoline for these trips that are vital for a vibrant economy in the Village.
4. Provide 24-hour energy availability and convenience for personal transportation purposes.
5. Simplify vehicle maintenance for EV owners.
6. Help solve the metropolitan air quality nonattainment area severe classification that includes the Village, placing area highway funds at risk.

III. TIME FRAME

We have chosen a near term time frame of the next 5-10 years for our entry. While this may seem to be a short period for the usual planning scope, we believe that EVs must be introduced and survive in the near term period for any long range visions to be realized.

IV. EV CHARACTERISTICS

In the next 5-10 years EVs will have the characteristics and performance that has been defined by prototype cars already built and tested:

1. 4-passenger car with a likely occupancy of 1-2 persons.
2. 20-120 mile single charge range.
3. 5-mile expressway capability included in # 2.
4. Existing battery system, predominately lead-acid.
5. 0.3-0.7 Kwh energy consumption per mile of driving.
6. An automatic on-board charger that can operate at either 120 or 240 volts that does not require the user to set a timer or otherwise select a charging period.

In addition to the 6 items listed above that are already included in prototype EVs, our experience indicates two additional features are necessary for EVs to be consumer acceptable:

1. A disabling circuit for the control system that will immobilize the car when it is plugged in.
2. An on-board display of energy (Kwh) added, withdrawn, and net amount available. Energy storage ability and losses vary with power levels experienced during driving. Energy withdrawn is a non-linear function. EVs must have the equivalent of a gasoline gauge to be a successful consumer product.

V. EV USES IN THE TARGET COMMUNITY

We believe that EVs will substitute for conventional car use for those consumer short trips within the range capability we have postulated. There has been considerable EV development effort to find some way to extend the single-charge range of an EV and make their performance approach that of a conventional internal combustion engine (I.C.E.) car. An examination of the various battery systems indicates this may not be a realistic goal as one gallon of gasoline weighing 7.2 pounds has the electric energy equivalent of 30 Kwh.

Our planning for EV use in the near term envisions a consumer acceptance of the EV range limitation and a willingness to operate an EV within its capability. Census data and a Zip Code survey conducted for the Village in connection with establishment of a commuter bus service indicates that an EV can be used for over 70% of all driving. This agrees with other national data.

We expect the following uses for EVs in the target community:

1. Driving to and from rail station parking lots.
2. Work and school commuting within the Village and nearby locations.
3. Consumer short trips for any purpose.
4. Attending community events.
5. Local governmental applications.

PHYSICAL PLAN

This entry is based on the maximum use of existing infrastructure. For EVs to be successful their ownership and operating costs must be lower than those of an I.C.E. car. Runzheimer International 1991 data indicates it costs \$0.39 per mile for a new I.C.E. car in the Chicago area, much of this for finance charges and depreciation. Future infrastructure investments for EVs must also be minimized.

I. STANDARD CHARGING CIRCUITS

Minimizing infrastructure future costs requires that EVs be able to utilize the 120 and 240 volt electric supply circuits now available. Every type of battery system: lead-acid, nickel-iron, sodium-sulfur, or others must be able to use either of these sources for recharging.

The first is the ubiquitous standard 15-20 amp, 115-120 volt circuit that has a peak power capability of about 2 Kw. This circuit is suitable for home recharging and elsewhere if the vehicle will be parked for a minimum of about 4 hours. As a courtesy to guests arriving in an EV, we suggest a homeowner may wish to have a recharging facility available in front of his house in the form of an adaptation of an old-fashioned cast iron hitching post (Exhibit C). Placing these on public property will require an enabling ordinance.

The second charging circuit is a 30 amp, 220-240 volt circuit that has a peak power capability of about 7 Kw. Homes with electric clothes dryers already have this circuit. It is also suitable for opportunity charging when the car's expected parking time is less than 1 hour.

II. CONNECTION OF EVs TO SUPPLY INFRASTRUCTURE

Plugs now used for electric lawnmowers and small tools will require modification for EV use. Components must be protected against corrosion by road salt in addition to being weatherproof. Plugging facilities should be located in the front and rear of the EV to accommodate a charging connection from either end. Twist-lock style connectors are not suitable for consumer manipulation. The EPRI work on this matter should be incorporated into a national consensus standard before significant commercial production is initiated.

We believe that home charging will be the principal means used by EVs. This energy source is available 24 hours a day, maximizes existing infrastructure use, and will eliminate the need to take the car to the equivalent of a gasoline station for energy. It also frees the owner from gasoline supply interruptions and, because electrical rates are regulated, provides protection against unexpected price changes.

III. CONSUMER SAFETY IN MAKING THE CHARGER CONNECTION

The greatest safety will be provided by requiring the supply circuit to be deenergized while the charging connection is being made. The supply facility must contain sensing and energization equipment to accomplish this function as well as ground fault interruption.

Our entry includes the preliminary design for a facility that will accomplish this requirement for opportunity charging locations where there will be a billing for energy. It includes ability to use three payment options; cash, national credit card, or prepayment card (Exhibit D).

IV. PAYING FOR ENERGY USE

The new infrastructure to support EVs does not require an elaborate, costly metering and billing capability. From the utility viewpoint, if the electricity to charge an EV goes through an existing customer's meter, new EV metering facilities are unnecessary. The opportunity to sell additional energy from existing generation at marginal cost to present customers for a purpose not now served is all that should matter to the utility. The resale of electricity will require a review of utility policy and franchise ordinances.

5

The energy required for opportunity charging will be small. A 20 mile trip recharge will require about 10 Kwh. At current local rates, this will amount to about \$1.

V. RAPID CHARGING FACILITIES

We believe that rapid charging is neither necessary nor desirable. The investment required for electric supply facilities for this purpose cannot be justified either technically or economically. The charge acceptance rate of battery systems is limited. Also the electrical equivalent of the power level delivered by a standard gasoline pump's 3-4 gallons of fuel per minute represents about 8,500 Kw. The power from this single pump is equal to the power of a small substation.

VI. FLEET CHARGING

This entry excludes special facilities for fleet charging. No fleet manager will risk exposure that an EV fleet could become immobilized by a major power interruption to all electrical service. On-site generation would be required to protect against this event. There may be a few EVs in a fleet for special uses, however, that can be charged from the 30-amp circuit mentioned above.

VII. EMERGENCY SERVICE

Roadside emergency service can be provided by existing towing services that can be used to move a disabled EV to a charging or service facility. We recommend that EV manufacturing requirements include a standard towbar attachment for emergency service convenience.

IMPLEMENTATION PLAN

Implementation of the concepts presented in our entry depends on creating a consumer demand for EVs. An important element in this is demonstrating to consumers that having an EV will reduce transportation costs as well as protect against gasoline supply interruptions. We believe few consumers will choose an EV for environmental improvement alone. This can be legislated as in southern California, but these fiats are subject to review and reversal if they do not attract public support. Individual financial incentives we believe will be the most effective implementation tool.

Our experience with EVs over the past 15 years has shown that substituting an EV on short trips for an I.C.E. car use can save money and the useful life of the ICE car will be extended when it is not used for short trips involving cold starts. Additionally, as emission control systems are least effective during engine warmup, electric heaters for catalytic converters have been proposed to solve this problem. That energy can be better utilized by an EV.

Extended vehicle life will reduce the annual financing and depreciation costs for a conventional car that will still be required. One of our principal authors last year retired his 1973 Buick Estate Wagon after 19 years of service because it suffered from terminal rust. His annual cost for 16 years of substituting an EV for the Buick was \$392. Runzheimer 1991 data estimates the annual cost for a new conventional car in the Chicago area was \$5820. Saving a consumer \$2-4,000 per year by substituting an EV is a powerful incentive.

Implementation also requires target community support. Bookshelves are filled with visionary, lavishly illustrated plans prepared by competent consultants. These documents are gathering dust because they lack the essential ingredient of community support for the plans. Arthur Vandenburg, the former Michigan Senator, once observed, "If you want me aboard for a landing, you have to invite me aboard for the takeoff." We have taken his advice!

We have held discussions with the Village staff about our entry and obtained their support for our plan. We have offered to provide EV information and make presentations to the citizen committees for their use in planning for EVs in the Village.

After the planning process is completed, implementation steps can be initiated. The first will probably be installation of opportunity charging facilities in commuter parking lots. These can be designed, installed, and managed by the Village. Our entry provides a blueprint. We also suggest that the electrical facilities now in place for Main Street lighting poles that are used for the Village's annual Heritage Festival can also be adapted to accommodate EV charging outlets year-round.

There are implementation incentives for the installation of charging stations on private property. For competitive reasons, shopping centers should consider recharging facilities for their EV owning customers. There are 5400 Northern Illinois locations employing over 100 persons, mandated to reduce work site commuting by private auto by 25% by 1996 because of air quality non-compliance that place Federal highway funds in jeopardy. If EVs are given proper credit for environmental improvement, we believe the private costs of EV charging facilities in these parking lots will be substantially less than other measures, especially penalties.

EV MARKET DEVELOPMENT

As a final step in our plan, we recommend that the Federal Government redirect some of the funds now committed to EV tax credits and hardware development programs. These resources should be earmarked to priming the EV market by devising a trial leasing program for commercially produced EVs which would create a sizable fleet of vehicles and get them into the consumer's hands.

The leasing program would arrange financing grants for a short-term (six months) trial lease of EVs in communities that develop EV infrastructure plans. These leases would be based on the cost of the least expensive subcompact I.C.E. car (currently about \$6,500) that could be used for short trips. We are confident that US automobile companies can produce EVs in quantity and sell them at a profit for the target price. The leasing program could be administered by auto dealers, their manufacturer-supplier, or auto leasing firms.

The key to get EVs into general use is to create consumer demand for these vehicles. EVs need not wait for the elusive "better battery". We believe that once consumers have the chance to try a reasonably priced vehicle of the type we have defined, they will be reluctant to give them up after the lease expires.

SUMMATION

In summary this is more than just a competition entry, it represents a common sense approach to EV issues in everyday American life. EVs will maintain needed mobility, offer energy alternatives, and provide environmental improvements, all of which are essential to the future quality of life in the Village.