

# FOX VALLEY ELECTRIC AUTO ASSOCIATION NEWSLETTER FOR FEBRUARY 2001

**NEXT MEETING: Friday, February 16, 2001 in the Triton INDUSTRIAL  
CAREER BUILDING, (East Campus), Room 108**

**DISCUSSION TOPICS: 1. The Triton Project 2. Membership renewals. 3. ComEd  
presentation on electrical supply. 4. New projects. 5. Other 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 February will be \$17.

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

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## February PRESSEZ

The major subject at our February meeting will be ComEd's presentation about the status of electric energy supply in Illinois. When we convert a conventional car to electric drive will the electricity be there when we plug in? A California-style electricity crisis would have a chilling effect on electric cars.

Preceding this presentation we will discuss the Ford Ranger pickup for the Triton Project. At my request Ray Oviyach sent a marvelous letter to Triton informing them we are ready to tackle the challenge of using the automatic transmission on vehicle. I hope to have Triton's decision by meeting time.

This Newsletter issue includes the 2001 Membership Roster that is sent only to paid members. It is not included in the e-mail version. . Half of 2001 members have e-mail addresses. Renewals by 83% of last year's members indicate our Web policy has not diminished the funds needed to support our activities. I expect this year we will pick up new members replacing those who did not renew.

Two members have projects underway. John Emde is doing the work for Paul Harris in converting a 1982 Mazda RX-7 and Ted Lowe has purchased a Chevy S-10 pickup conversion from an Internet seller in Florida for \$ 5000. The seller used the vehicle to commute to work but his circumstances have changed. After refurbishing the pickup Ted intends to use the vehicle for his 30 mile daily commute.

BILL

## MINUTES OF THE JANUARY, 2001 MEETING

The meeting at Triton was called to order by President Shafer at 7:36 PM. Nineteen members and four guests attended.

The December meeting was cancelled – no minutes to approve. Treasurer Corel reported no change in our savings account and \$ 2,772.27 in the checking account. His report was accepted.

A proposed e-mail membership class for former members of the FVEAA who were paid-up for the past 5 years was approved. An e-mail member will receive e-mailed copies of the monthly newsletter at no cost. This will enable us to stay in touch. There is no cost to the FVEAA or e-mail member.

Three complimentary memberships were approved; Doug Mather for his FVEAA Webmaster work, Kevin Zak, President of Net Gain Technologies, and George Hamstra, also from Net Gain.

President Shafer announced; that any member wishing to subscribe to EV NEWS, a good magazine about electric vehicles, can do so for a concession price of \$ 32. Mention that you are an FVEAA member. EV News mailing address is Energy Futures, PO Box 4367, Boulder CO 80306. Editor Lewis Gulick is a paid FVEAA member.

The meeting was recessed for inspection of the 1994 Ford Ranger pickup proposed for the Triton Project. The truck was given to Triton for use in the Automobile Technology Program. It has a VIN, 4 miles on the odometer and an automatic transmission. Use of the vehicle was discussed after the inspection.

The conclusion was it would require modification of the controller start-up procedure which prevents starting with a partially-depressed throttle. The second change would keep the motor idling at 3-400 rpm to keep the transmission hydraulics pressurized. The third is to change the shift points on the transmission to match the series motor torque curve. Members though the probability of success is close to 100%. If Triton decides to use the vehicle it will be necessary to purchase two shop manuals. Their cost is about \$ 300.

Member Zak announced *Bad Amplitude* will be displayed at the *World of Wheels* show car exhibit at McCormick Place in February. He also announced that Net Gain had purchased a 1992 Mazda RX-7 with the engine removed intending to convert it to a racing car. Net Gain has decided not to proceed and will sell the car for \$ 450 + delivery charge. Member Ted Lowe has agreed to buy the car.

Guest Bill Trapp from Palatine asked about conversion of a 1985 Olds Delta 88. The consensus was this was probably not a good candidate.

Member Ray DeBoth brought a printed circuit review mirror warmer. He discussed the possibility the technique could be used for battery warming. It device has a desirable feature of being self-regulating, turning off when the designed temperature is reached. Ray will pursue the idea with the manufacturer.

Member George Gladic discussed is GLEET engine conversion in a SUV. The technique is supposed to increase mileage and allow a choice of fuels. Members inspected his car after the meeting concluded.

The meeting was adjourned at 10:30 PM

Submitted by Secretary Dick Ness.

## From other EV newsletters; and articles affecting EVs

There were few articles about EVs this month but a lot of articles about the California energy crisis.

**DEVC, The Denver Group's** January Newsletter, ably edited by Geroge Gless, reviewed 16 articles; 4 about hybrids, 4 fuel cells, 4 policy, 2 solar, 1 microturbine, and 1 article about batteries.

The battery article was a tongue-in cheek account about "battery expanders". When an "additive" is applied to the negative plate of a lead-acid battery it is said to, "affect the morphology of lead and lead sulfide compounds." Plate capacity losses caused by passivation is supposedly reduced and life extended. One battery researcher reportedly, "accidentally dropped his sandwich into a test cell and performance improved." Battery chemistry is more akin to alchemy than technology.

One of the solar articles was about an Australian 50-acre "sun farm" installation that has a 1 megawatt power level. The cells are installed on solar tracker pedestals.

The *Wall Street Journal* had an article about energy guru Amory Lovins, who has long advocated the 200 mpg *Hypercar*. He is now proposing a fuel cell SUV that he projects will deliver 99 mpg.

**EEVC, the Eastern Group**, in their January Newsletter recognized their "Member of the Year" who is building a hybrid with a sterling engine. They also had a photo and article about the *Lomax Lambda*, British kit car based on a Citroen 2CV chassis. It uses a 45 hp engine. (Attention Al Wagner)

**There has been extensive reporting on the California electricity crisis. It is an ENERGY crisis, not a POWER crisis.**

The reports ascribe the 1966 deregulation legislation as the cause. The Legislation required private utilities to sell their generating plants to independent buyers and then buy electricity on the open market. (I find it ironic that the buyer of ComEd's coal fired generating units was Edison International, parent company of the utility serving the area outside of Los Angeles). The Los Angeles municipally owned utility was allowed to opt out of deregulation and is in good shape,. Private utilities are in trouble. Retail rates were fixed but market rates were subject to market forces only. An Independent System Operator (ISO) was created to handle transactions.

Sale prices exceeded the book values for the generating plant sold. The only way the new owners can make a profit on what became more expensive units is to run the units and sell energy. The former rate base, which was a major factor in setting regulated rates, disappeared with deregulation.

Gone too was the management of generating unit *scheduled maintenance*. Periodically it is necessary to take a unit out of service to perform maintenance on components. Scheduled maintenance was done at the time when **system** peak loads are lowest. Now it became an individual decision for each plant with no coordination. Electricity must be generated and consumed in the same instant. There is never an "inventory" of electricity, only an inventory of generating capacity, an on-site fuel inventory, and skilled persons to operate the system

An audit found that 25% of California's generating plant was out of service for maintenance at the same time. On-line capacity was insufficient to meet requirements. This is the most-likely immediate cause for the crisis.

BILL SHAFER

## Bill Shafer's Mazda RX-7 Conversion to Electric Power

This is the second car I have converted to electric power. The first, a Dutch DAF with a continuously variable transmission (CVT), was converted in 1974 following the first oil crisis. The CVT worked well with a series wound aircraft starter-generator. The car was used until 1990 when it was junked because of structural, terminal rust. Rust is one thing that is sure to end the usefulness of any car. Usable electrical components were removed and sold to another FVEAA member who used them in converting an Escort.

I bought the 1980 RX-7 with a dead engine for \$ 300. The 1990 conversion required about six months of evening and weekend work. Cost for conversion and two upgrades were \$ 7300. The table below shows relevant data:

Car Type	1980 Mazda RX-7
<b>ELECTRICAL COMPONENTS</b>	
Motor	8" Advanced DC
Controller	Curtis PMC 1221C-7401
System voltage	96 (Nominal)
Batteries (12)	Trojan 825 (8-Volt) flooded
Battery Charger	Built by FVEAA member Ed Meyer ( 98% Efficient, 10 lbs)
Instruments	Ammeter, Suppressed zero Voltmeter.
<b>MECHANICAL DATA</b>	
Original car curb weight	2350 #
Maximum allowable weight	3400 #
Converted car weight	2859 #
Weight distribution	Front – 1269 #, Rear – 1590 #
Motor coupled to existing 5-speed transmission,	
Original rear springs replaced	
<b>PERFORMANCE</b>	
Top Speed	61 mph
Single-charge range in urban area	31 miles
Acceleration	Keeps up with urban traffic
Energy economy	0.522 kWh/mile

Since conversion the car has been driven 11,603 miles as of January 1, 2001 and consumed 10,137 kWh of electricity. Energy consumption was cut in half after the system voltage was upgraded to 96 volts and the 72-volt charger replaced with one that is 98% efficient. The average trip length in 2000 was 9.6 miles.

Power plant sources for generating electricity in 2000 according to ComEd's December 2000 environmental disclosure were 71% nuclear, 21% coal fired, 1% natural gas and the rest unknown purchased from various sources. Year 2000 emissions for the Mazda were 373 lbs. of carbon dioxide, 1 lb. of nitrogen oxide, 1.1 lbs of sulfur dioxide, and 0.004 lbs of high-level nuclear waste.

Environmental improvement is one reason for conversion of cars to electric drive. Saving money is another.

**MAZDA RX-7 ANNUAL COST FOR YEAR 2000**

<b>Project Cost</b>			\$ 7300
	<b>Annual Cost</b>		
<b>Fixed Costs</b>			
Depreciation period	15 years		
Capital Recovery	(Project Cost)(CRF, 15 years @8%)	(7300)(0.10979)	801
Insurance	Liability only		184
License Fees	State & local		53
Total			\$ 1038
<b>Operating Costs</b>			
Annualized repair and maintenance			123
Battery Amortization	(miles driven)(\$0.11/mile)	(1406)(0.11)	155
Electricity	(kWh)(marginal rate)	(745)(0.0657)	49
Subtotal			327

CRF = Capital Recovery Factor

**Total 2000 Annual Cost**

**\$ 1365**

**FOR COMPARISON, HONDA CIVIC ANNUAL COSTS FOR YEAR 2000**

For other driving we use a 1996 Honda Civic DX. In 2000 we drove it 3423 miles, consumed 102 gallons of gasoline (Average mileage = 33.6 mpg) and spent \$170 for fuel (Average cost/mile = \$ 0.049). Purchase price in 1996 was \$ 15,173. Maintenance cost for 5 years of was \$ 610 (\$ 122/year). I expect the car to last at least 15 years. The following table lists the Honda costs:

<b>Purchase</b>			\$ 15,173
	<b>Annual Costs</b>		
<b>Fixed</b>			
Depreciation period	Fifteen years		
Capital Recovery	(Purchase cost)(CRF, 15 years @8%)	(17,173)(0.10979)	1885
Insurance			319
License Fees			93
Subtotal			2297
<b>Operating</b>			
Annualized repair & maintenance			\$ 122
Fuel			167
Subtotal			289

**Total 2000 Annual Cost**

**\$ 2586**

There is one item missing in this analysis. By substituting the Mazda for the Honda for short-trip driving I am extending the life of the Honda. A rigorous analysis would include this item. The Mazda cost in 2000 was 97 cents per mile, the Honda was 76 cents. The Mazda and Honda per-mile cost would have been equal had I driven the Mazda an additional 600 miles.