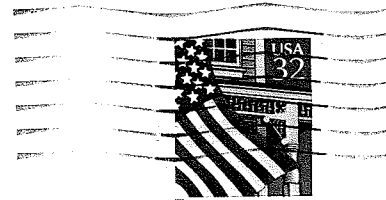
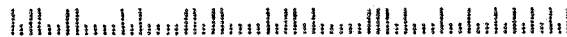


**Fox Valley Electric Auto Association
1522 Clinton Place
River Forest, IL 60305-1208**



John Emde
6542 Fairmount Avenue
Downers Grove IL 60516 -2919

Address Correction Requested



NEXT MEETING: Friday, September 19 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. Updating report on the Future Car Challenge.
2. Authorize 1998 paid-up membership for persons who donate a Participagion Share.**

MEMBERSHIP INFORMATION

Any person interested in electric cars is welcome to join the FVEAA. The cost for a full year's dues is \$20 that 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 September will be \$ 4

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

President - Ken Woods
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Vice President & Editor - Bill Shafer
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SEPTEMBER 1997 PRESSEZ

Results of The Future Car Challenge for 1997 will be reported by Bob Larson from Argonne. It will be interesting to compare the performance of vehicles designed by college students with the recently announced Toyota Hybrid that uses a 1.5 liter engine and nickel metal hydride batteries.

Member Ed Meyer's Nissan was entered in a car show in Bolingbrook and won a trophy. He will report on this event.

Member L. J. Obiala of Weyauwega, Wisconsin has donated his Participation Share to the club. His contribution, and a similar previous action by Member Ben Schmidt, will be recognized.

Ken

AUGUST MEETING MINUTES

Sixteen members attended. The meeting at the College of Dupage was called to order by President Woods at 7:41 PM. He announced that the scheduled speaker for tonight's program will be unable to attend. The subject is rescheduled for September.

The minutes were approved. Treasurer Corel's report that there was \$ 1325.71 in the checking and \$ 2322.42, in the savings account was also approved.

It was announced that George Krajnovich is willing to practically give his MI Towncar to a member willing to replace cannibalized parts used in his new conversion. George expects to complete his new conversion by mid-September. Anyone interested will have to act promptly.

President Woods noted he received an inquiry from someone who was interested in a "turnkey" conversion.

The FVEAA was contacted for information on the 1960's "Henny Kilowatt", manufactured by Eureka-Williams in Bloomington, IL. The car was converted from a Renault DAUPHINE. James Day wants to restore it to original condition. He says he is an "old car buff".

Dana Mock reported that next year a group of persons interested in hybrid vehicles plan a demonstration trip by the cars these cars in 1998. They are seeking charging locations. More info on charging voltages, current draw, and electric plug requirements is needed. Dana will follow up on the INTERNET inquiry.

Dana also reported on an article about an unmanned solar-powered electric airplane that set a new altitude record for this type of aircraft.

Member Ed Meyer reported he has put 1800 miles on his Nissan since acquiring the car.

Member Helenowska exhibited her "Steinmetz Electric Eco-Van" at a recent sidewalk sale on Chicago's northwest side.

Member Andy Redpath led a discussion about the Nissan Owner's Manual which is just about complete. Additional details are required for the temperature, "fuel" gage, and vacuum pump. Dana Mock will provide.

Member Ed Meyer led a discussion about construction of a "Decision Tree" for an electric vehicle conversion, based on the club experience with the Nissan. Dr. Meyer used a rigorous, 4-box approach for construction of this document. The elements ask the questions: "What is it?; How Does It work?; "What does it do?, and What does it cost?". After wrestling with this applying this approach for just a few preliminary items it became evident this would be much too complex a task for the FVEAA successfully complete as a club project.

As an alternative, we will construct a flow chart outlining the decisions and procedures taken during the Nissan Project. Member Shafer volunteered to extract the relevant data from meeting minutes. Project Manager Munroe volunteered to provide a summary of entries from the work log.

The meeting was adjourned at 10:35.

Submitted by Secretary
Dave Aarvold.

RECENT ARTICLES ABOUT ELECTRIC VEHICLES

Ruling Gives a Big Push to Electric Cars in New York State. NY Times 8/6/97. A NY judge upheld the six-year-old law requiring 2% of vehicles sold during the 1998 model year must be powered by electricity. The number increases to 10% by 2003. NY is now the only state with this mandate. California and Massachusetts backed away from similar mandates. Officials estimate 7800 vehicles are involved. Auto companies failing to comply are subject to fines that can be up to several thousand dollars a day. Car makers plan to appeal the decision.

Road Sailing. Autoweek 8/11/97, Page 15. This is the first of three EV articles in the issue. This article deals with Alan Cocconi's T-Zero purpose-built sports coupe. The 2400-pound, 2-seat car features a steel tube chassis and glass fiber bodywork. Twenty-eight Optima lead-acid batteries are mounted inside body sills. There is a 110-pound AC induction motor that delivers 165 kw. (220 HP). The electronic control unit adds another 70 pounds. By using field weakening Cocconi has tuned the power curve to peak at 6000 -12,000 rpm. Maximum torque is 180 lb-feet at zero rpm. Acceleration 0-60 mph is 4.9 seconds. Top speed is limited to 90 mph.

An unusual feature is a 350-pound package trailer that holds an engine-alternator combination. The engine is 500-cc Kawasaki water-cooled parallel twin that drives a 20kw generator. The trailer is equipped with a feature developed by Cocconi called "Back-Tracker". This is a self-steering system for automatic highway stability and no-brainer trailer control in reverse. It overcomes the tendency of short-coupled trailers to yaw during straight travel. A yaw sensor mounted on the trailer hitch feeds a signal to a computer that controls the trailer wheels. The trailer feels like a rigid extension of the car.

One for the Faithful on Page 18 of Autoweek covers the familiar GM EV-1. Most of the car details have appeared in previous issues of our Newsletter. Additional info in the article worth noting include: AC motor delivers 137 HP @ 7000-12000 rpm; torque 128 foot-pounds @ 7000 rpm; curb weight 2970 lbs. The car is marketed by Saturn. Info can be obtained over Internet address www.gmev.com.

The Future Comes Silently upon Us, Page 20 of Autoweek is about Honda's EV Plus. The 3594 lb car has a 49kw brushless DC motor that delivers 65.7 horsepower @ 8750 rpm and has 203 lb-feet of torque @ 1700 rpm. There are twenty four 12-volt NiMH batteries. 0-60 acceleration is 17.29 seconds. The car is equipped with many driver conveniences found in gasoline cars. Info can be obtained over Internet address www.honda.com.

Member Rod Bohlmann put information about his converted Escort, "SPARKY" on the Internet. It includes photos of a recent inspection made of the motor. The Internet address is <http://vu-alumni.elfwerk.com/~rjb/sparky/Sparky.html> He is thinking of increasing the 60 volt system to 96. He invites comments. If you want to send e-mail, his address is rodbohlmann@lmco.com

Turbine to Power Cleaner Cars. GMencore (For retired GM Employees) July-August, 1997, Page 2. A cooperative venture between GM and Williams International is developing a gas turbine engine that could boost the efficiency of hybrid-electric vehicles by 5%. The small unit is intended to run intermittently when needed to extend EV range. The ability of the turbine to use just about any kind of fuel is expected to be advantageous.

FROM OTHER EV NEWSLETTERS

EEVC, the Newsletter of the Eastern Electric Vehicle Club, in their August issue featured a fine account of the Pennsylvania Power & Light Electric Car Expo and Trials. The event was held at Pocono International Raceway. This year's offering included an unusual display of electric go-carts, sponsored by Arnold's Go-Kart Center. Two type of cars were driven. The high speed carts which did some serious racing and featured one entry equipped Optima spiral wound batteries that have a high power capability. The Kidracers that had a speed 10 times lower than the high speed variety. Kidracers are for children 2-6 years old.

Other EVs at the event included a car converted by Cinnaminson High School students, the University of Pennsylvania's solar racer that finished 15th in this year's competition, and a converted Rabbit by one of the members. The hit of the show was the 1919 Detroit Electric from the Boyertown Museum.

President Oliver Perry had an editorial that looked back over their EV efforts that date back to 1979. Then EV groups were trying to stir up interest in electric cars. That objective remains the same today. He noted the "do-it-yourself" conversions produced were not good enough for most people. With technological innovations coming so fast and with commercial offerings using these pieces he asks, "With our efforts today are we creating a dinosaur?"

The August Issue of EV News from Larry Dussalt's group is the Executive Report. It gave results of the Cleveland Race, reported that EVs will receive more tax breaks and more federal funding, had an article on the Chevy S-10 program, and included an article written by Bob Wing on a trip he made in his 1959 MGA Roadster refitted with a ZAPI controller.

A Mike Bianchi interview with James Worden, head of Solelectria, is worth reading and is reproduced in this FVEAA Newsletter.

EV Circuit, the Ottawa folks in their July/August issue featured Part 1 of "EV Batteries -TLC" that was worth noting. If you want to read it, see Librarian Ed Meyer. The issue also reports from INTERNET sources that Orange County (CA) may have bought their last diesel bus due to ever-more stringent emission standards.

EVUpdate from the Sacramento group in their August issue indicates that, according to Nikkei English News, Toyota will be selling EV recharging equipment to rival Nissan. The charger uses inductive technology and is used on Toyota's RAV4-L EV. Nissan plans to use it in later versions of their Prairie Joy EV.

An August News Release from NESEA (Northeast Sustainable Energy Association) reports on comparisons of energy efficiency between electric conversions and their gasoline equivalent platforms. In the Tour de Sol, a gas powered Toyota RAV 4 and a Geo Metro were driven immediately behind electric versions of the same vehicle. Gasoline usage was metered as was electricity used for recharging. Miles Per Gallon electric (MPGe) was calculated assuming each Kwh of electricity is equivalent to 0.0658 gallon of gasoline (A 20% energy loss for refining and transport was assumed for petroleum.) The RAV-4 got 14 MPGe while the RAV4-EV posted 30 MPGe. A Geo Metro got 32 MPGe while its Solelectria conversion achieved 59MPGe. A 96 Chevy Beretta hybrid built by Swathmore College got 42MPGe. (Editor's note - don't forget battery amortization. when calculating costs.)

RECENT ARTICLES ABOUT ELECTRIC VEHICLES - Concluded

Ohio State University's electric race car charges ahead in wins. Columbus Daily Dispatch. OSU won the Independence Day weekend race at Cleveland with a fastest lap time of 139 mph. The win involved a battery change every seven or eight miles (15-20 minutes). This put a real strain on the pit crew to switch 31 batteries weighing a total of 1440 pounds in less than 25 sec.

Charged Up! What's Behind GM's Electric Vehicle Strategy. Automotive Manufacturing & Production, July 97, Page 60. In this article, Robert Purcell, executive director of GM's Advanced Vehicle Technologies, comments on the intellectual leadership in GM's decision to go from the IMPACT to the EV1. It started in 1992 with CEO Jack Smith's mission to get GM back on the track as an industry leader. In 1994 Purcell made a final presentation to the GM Board that included electric cars. GM's investment in the project at that time was \$ 300 million and the prospects were the IMPACT would become a display at EPCOT Center. The Board decided to proceed with the EV1 and be the first to market a fundamental technological breakthrough for the automobile. Purcell now is the head of a team of 400 people building the EV1 at the Lansing manufacturing plant where the EV1 is produced.

A second part of this article concerns building of the Chevy S-10 pickup electric truck. The conversion of this product takes place about 2 miles from the Shreveport, LA plant that builds the basic truck. Gliders are received, five at a time, from the source and converted at a series of 11 workcells in the conversion plant. The workforce consists of 22 persons, 13 actually performing conversion work. After conversion, the cars are returned to the main assembly facility where wheel alignment and dynamic tests are performed.

HERE IS FORD'S COMPARISON OF THE S-10 AND COMPETING FORD RANGER

SPECS	<u>Ranger</u>	<u>S10</u>
Model Year	1998	1997
Model	Reg. Cab, 4x2	Reg. Cab, 4x2
Job #1	December 1997	May 1997
Base Price	\$32,795	\$33,779
Lease	TBD	4 Year w/single payment of \$30,825.91
Replacement battery	Yes	No
Air Conditioning	\$1,770	Std (Heatpump A/C)
Battery Heater	\$425	Std
Spare Tire/Jack	\$170	Std
Air Bag	Driver, Pass Std	Driver Only
Range	58 mi. (FUDS)	40 mi. (city) / 45 mi. (hwy)
Top Speed (Governed)	75 MPH	70 MPH
Curb Weight	4700 lb.	4300 lb.
Payload	700 lb.	850 lb.
Motor	90 HP	114 HP (EV1 powertrain)
Drive Configuration	RWD	FWD
Charger	On Board (Conductive)	Off Board (Inductive)
Charging Time (0 - Full)	6 Hours	4 Hours
Required Equipment	\$1800 Power Control Station (Indoor or outside)	\$2000 Charger (Indoor) / \$3200 (Outside)
Wheelbase	112 in.	108 in.

An Interview With James Worden

By Mike Bianchi

Each year at the Tour de Sol I try to get some uninterrupted time with James Worden, founder and CEO of Solectria Corporation. This year that happened on Thursday afternoon of the race, in North Conway, NH.

James was very happy with his 249.7-mile (odometer reading) record in #76 Solectria Force NiMH. Is this the same style production Force with Ovonic's latest batteries?



"This is the same basic production battery, but just the newest one. In fact the [battery pack] that ran in the green car last year was very old. It had run in Phoenix. It ran in the Sunrise the year before. But it was the same production M-20 [modules]." (That's "M Minus Twenty", not "M-hyphen-Twenty".)

The Force NiMH is sold in two versions. The version with M-60 modules gets 105 miles per charge in the EPA tests and sells for about \$90,000. "About ten" of those have been sold. The longer range car uses the M-20s, like #76, and is about \$120,000. Solectria has sold "about six" of that model. Except for the batteries, it's the same as the lead-acid Force that sells for about \$34,000. Nearly 300 lead-acid Forces are on the road.

So it is easy to see that the nickel metal hydride batteries are still very expensive. James had hoped that by now the production levels would be up and the price would have come down. He is certain that if the price were lower, he would be able to sell many more Force NiMH's.

What about the Panasonic nickel metal hydride batteries we

see in the Toyota RAV4-EV?

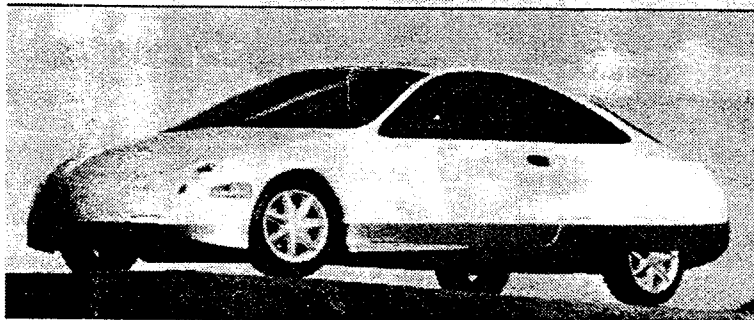
"Panasonic is not selling them right now." The NiMH batteries we see in the Japanese cars are not available on the open market yet.

The problem of NiMH batteries overheating at the top of charge is something that all the cars that use them must address. What does Solectria do?

"We don't stack batteries, ever. We have a very simple layout, very clean, with very good cooling. And we have monitors that, if anything is wrong, the car tells you. If you don't do something about it, then it gives you an alarm. And if you ignore the alarm for too long, it just shuts off. It stops charging, or stops driving, or whatever."

I repeated the idea, which I like, of having a monitor built into each battery module, but James thought it made things too complicated.

"A battery has to be simple enough that it doesn't have to have a mother for every cell. I believe very much in simple things. Right now our car has stayed pretty simple, and there is a chance it can be cheap if we make a bunch of them, maybe it can be cheap. A battery that gives you double or triple the range [of a lead-acid car] is very exciting, [but not if it] costs \$40,000 [more]. It is definitely our favorite mix of the advanced batteries." The self-discharge problems of a couple of years ago have been fixed, and "the newest batteries are excellent and really are right."



Solectria Corp. photo

What is happening with the Sunrise? It isn't here this year.

"The Sunrise is now under very heavy development towards production tooling. It should be unveiled at the 14th International Electric Vehicle Symposium in Orlando Florida [this fall]. That car

is being launched as a real car. We think it is the ultimate in a large size, comfortable, do-all-you-need-to-do electric vehicle."

Where will it be built?

"That's still under development." The point of the roll-out in production tooling is to sell the concept to automakers and partners. "The low-production tooling we're building will let us make hundreds of cars, like we are making with the Force right now. Hopefully we will be making thousands of the Force, and this car will come up that curve as the Force goes down." The rumor of a manufacturing facility for the Sunrise, "is an old rumor. Wherever the right incentives are, wherever the right partners are, that is where the plant will be." The two announcements they hope to make in the fall is that the Sunrise is production-ready and that they have a partner.

The Sunrise has changed quite a bit from last year, "but the basic character is still there. We have had to do a lot of cost reduction, and we have to do a lot more, and that has changed some things and how it looks. But in a lot of ways it looks better. There are bumper fascias front and back." All the systems are more refined and the car rides smoother.

The first ten will probably be sold, before the unveiling in Orlando, to a few friends and supporters of Solectria who will appreciate "a two thousand pound, full-sized electric car with comfort and practicality."

And what about the Solectria Delivery Van that was supposed to have been in the American Tour de Sol this year, but didn't make it?

"We are very excited about that. It's an excellent vehicle to do as an electric. It will be available very soon.

The goal is to make a very cost-effective, very real utility vehicle for delivery fleets around the country and around the world." They are also courting a manufacturing partner or two for this vehicle.

Anything else Solectria is big on right now?

(See Worden on Page 4)

(Worden from Page 3)

"The big thing now is to get all the stuff we have developed into the hands of automakers, probably the smaller ones because they seem to be more interested, and build partnerships. We have a significant partner called Gold Peak Industries in Southeast Asia (Singapore, Hong Kong, Malaysia). You'll probably see some Gold Peak symbols on some of our stuff. This has been a long-term relationship. They bought some cars from us when they got into the battery business."

What about the competition from the hybrid-electric vehicles? At



Tom Hopper's hybrid EV at the 1997 American Tour de Sol

last year's NESEA Tour, Tom Hopper's hybrid Hopper EV demonstrated very practical long-range capability, and this year he has real competition from #18 Kineticar which did over 370 miles on propane. Solectria has always done pure-electrics. Any comments?

"I'm not so much a pure-electric guy, but I'm totally against piston hybrids. I think they are a big waste of time. The public awareness and education are tremendous, and I totally support that. It is definitely more efficient, and should be cleaner, but it is very difficult to do, very complicated, and has more maintenance and problems to worry about than any car you have ever seen.

"I believe that when fuel cells are developed and in a little box that are as simple as a controller, or a nickel metal battery, or a lead battery, let's do [hybrids] then. But small engines are hard to make [clean and efficient]. The complexity of all that stuff, to me, isn't worth doing when in ten years we will have

fuel cells and all that will have been a waste of time.

"You still need a good electric car to do any of these things, and to really make a good fuel cell car you're going to need a great electric car. So we put all our time and effort into good car design and drive systems."

So you see fuel cells as the future of the hybrid?

"I see fuel cells as the future for electric, because then you can either plug your car in, or fuel up when you need to go on a trip."

(This article is copyright Michael H. Bianchi who reported on the Northeast Sustainable Energy Association's American Tour de Sol through five states in New England last May 17-24. Permission to copy is granted provided the entire article is presented without modification and this notice remains attached. Bianchi can be contacted at tel 201-822-2024, fax 201-822-2085, e-mail bianchi@bellcore.com)

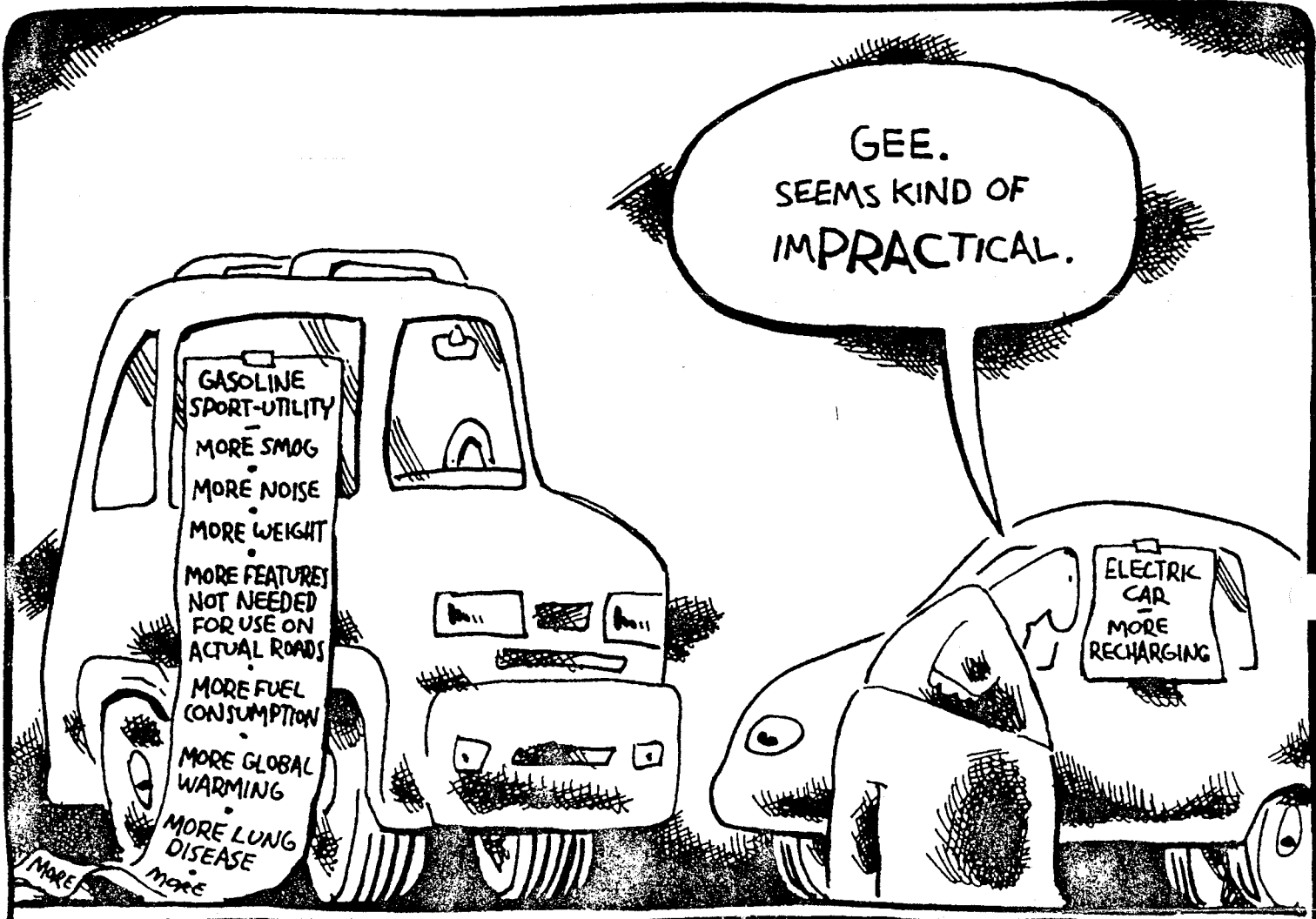
EDITORIAL

No volunteers offered a guest editorial for this issue so I will take advantage of the half-page available in this Newsletter.

Illinois has special plates for electric cars. My past EV plates are nailed to a storage shelf in my garage. The first was for 1974-75 and the latest is for 1996-97. I have owned an electric car for the past 23 years. That adds up to a bit of experience with electric cars. It began with a Dutch DAF with a Variomatic transmission coupled to an aircraft surplus shunt-wound motor operating at 36 volts with a voltage-switching scheme controller made up of relays with blocking diodes. It was converted following the first oil crisis in 1973, the same year the FVEAA was organized by John Stockberger. The car was used for commuting between home and office.

The first Electric Vehicle Symposium was held in Phoenix, Arizona in 1969. Hits of the show were GE's electric tractor and the Enfield "465" car from Great Britain. The 14th Biennial Symposium will be this year in Orlando, Florida. Articles in the Transactions for each meeting contain useful information and data that has been superseded by technical developments.

WE'VE COME A LONG WAY BABY!



GEE.
SEEMS KIND OF
IMPRACTICAL.

GASOLINE
SPORT-UTILITY
MORE SMOG
MORE NOISE
MORE WEIGHT
MORE FEATURES
NOT NEEDED
FOR USE ON
ACTUAL ROADS
MORE FUEL
CONSUMPTION
MORE GLOBAL
WARMING
MORE LUNG
DISEASE
MORE
MORE

ELECTRIC
CAR
MORE
RECHARGING

TOO FUTURISTIC.
AS IN, CAUSING ME TO
THINK ABOUT THE FUTURE.

TALS

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