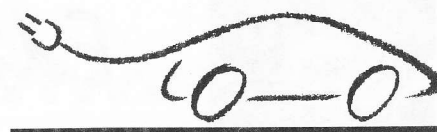


# CURRENT EVENTS



February 1994

Promoting the use of electric vehicles since 1967

Vol. 26 No. 2



## 80 MPG Car, Here Now! Auto journal praises Impact EV

BY CLARE BELL

A RECENT AUTOMOTIVE INDUSTRIES Magazine article argued that the 80 mpg clean passenger car that Clinton wants is already here in the form of the GM Impact EV. The "extremely aerodynamic, feather-light, yet battle-ship stout" Impact is already running on Michigan roads. Automotive Industries adds that "It can out-accelerate many hot-shot sporty cars from a standing start, yet at high speed, it's whisper-quiet. And above all, it's just plain fun to drive."

Impact also meets important federal and crash standards. It has all items required by motor vehicle laws such as windshield defogging, and features for passenger comfort, such as heating (using a high efficiency heat pump) and air-conditioning (using reformulated environmentally safe R134A refrigerant. All materials used in Impact are recyclable.

If one uses a conservative conversion figure of 27 kWhrs per gallon of gasoline, Impact fuels up on only 14 kWhrs, delivering a minimum of 55 high performance miles on LESS than a gallon of gas. If the full 27 kWhrs could be packed onboard, Impact would be more than an 80 mpg car, it would fall in the 100-120 mpg range!

The Michelin-supplied tires are a low rolling resistance design that gives enough of a footprint for good handling, and soft enough for low road noise. Instead of carrying the weight of a spare, the car uses tires are self-sealing in case of a puncture. Sensors on each wheel detect speed differences between one wheel and the other three. If a tire goes down, it causes a change in rolling radius, which alters the wheel's speed enough for the onboard

Continued on page 6

## Impact PrEView

EA MEMBERS IN HOUSTON AND San Francisco will have an opportunity to test-drive a GM Impact EV for two weeks. GM's Impact PrEView program will supply 10 cars to each of these areas for a total of 6 mo. Impact EV prototypes will be distributed by area utilities, who will recruit drivers. GM's plans for Impact will depend on the results of the test-drive. Widespread acceptance could kick the Impact into full production. A negative reception could kill the program.

Utilities who receive Impacts will be looking for individuals who own their own houses, so that residential wiring can be modified to accept the Hughes fast-charger. Potential Impact drivers would commute less than 70 miles/day, and are relatively affluent. The utilities and GM will also be looking for people who stand out as leaders in their communities, have high visibility and thus influence.

For more information about the Impact PrEView, contact your local utility company, or call 1-800-25ELECTRIC.

The Jan 1994 issue of Popular Science says of its own Impact test-drive, "the car has begun to leave an impression, not so much as a surprisingly good electric car, but possibly the best handling and best-

Continued on page 6

### FEATURES

Hot EV Info .....	4
Houston Symposium .....	5
Innovation & Risk .....	6
♥ EVs and Lovers .....	8
Sparks Fly over EV Regs ..	10
NOPEC in Nepal .....	13



## Editor's Note

By CLARE BELL

### Hearts, Flowers and EVs

*Let it not be said that CE ignores the romantic side of life. Many EVers are couples or part of a couple. For the spirit of Valentine's day CE is presenting "Ways to Keep Your EV and Your Lover". There may not be 50 suggestions in this piece, but it is drawn from experience (that your Managing Editor had when she did NOT follow the guidelines here presented — the car got built and the relationship survived, but there were some rocky moments.) An EV can EVEN enhance your love-life if you plan it right! HappEValantine's Day!*

### Impact for EAA

*The Impact PrEView test-drive program will soon begin in San Francisco and Houston. CE urges EAA members and chapters to do anything they can (short of blatant car-napping) to get an Impact for test. Impact 3, despite modifications from the original AeroVironment concept, is a damn good car, perhaps better than GM wanted it to be. GM, however, doesn't seem to have faith in the car. They are looking for excuses not to produce Impact. Let's not give them any.*

*EVs are coming. While the Big Three try to undercut the CA ZEV mandate, European and Japanese manufacturers are preparing to meet it. Small US EV companies may be able to expand enough to supply part of the huge volume of cars required in 1998, but imports will provide the rest.*

*Overseas manufacturers are not ignoring technical developments made by US R and D companies. Batteries from companies such as PolyPlus and Electrosource could power subcompact EV imports. AeroVironment could sell its concepts and engineering expertise to a Japanese or European automaker. Impact-like cars will be running on CA roads by 1998, with or without US nameplates.*

*EAA or affiliate members in the test areas meet the PrEView drive qualifications. Also, make it a chapter project to get and evaluate an Impact. Compare it against good chapter cars. (I'd like to run it against my Porsche 914 down Route 280.) Give the utilities and GM honest feedback and enthusiasm. Don't let Impact 3 go back on the shelf as another forgotten concept car.*

*WESCON '93 proved that EAA has clout. Let's use it to "Make an Impact".*

—CB

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If you would like to submit an article for Current Events — the preferred form is on a floppy disk, formatted for DOS (Ascii Format) along with a printed copy of the article. Also include camera-ready photos or graphics or include TIF formatted files with your copy. The deadline for articles is the 1st of the month. Articles submitted after the 1st of each month will be retained for future issues of Current Events. Contact Clare Bell, Managing Editor for further information.

#### Advertisements

If you would like to submit an ad, refer to Advertising Rate Sheet. For additional information, contact Susan Hollis, Advertising Manager at (408) 374-8605.

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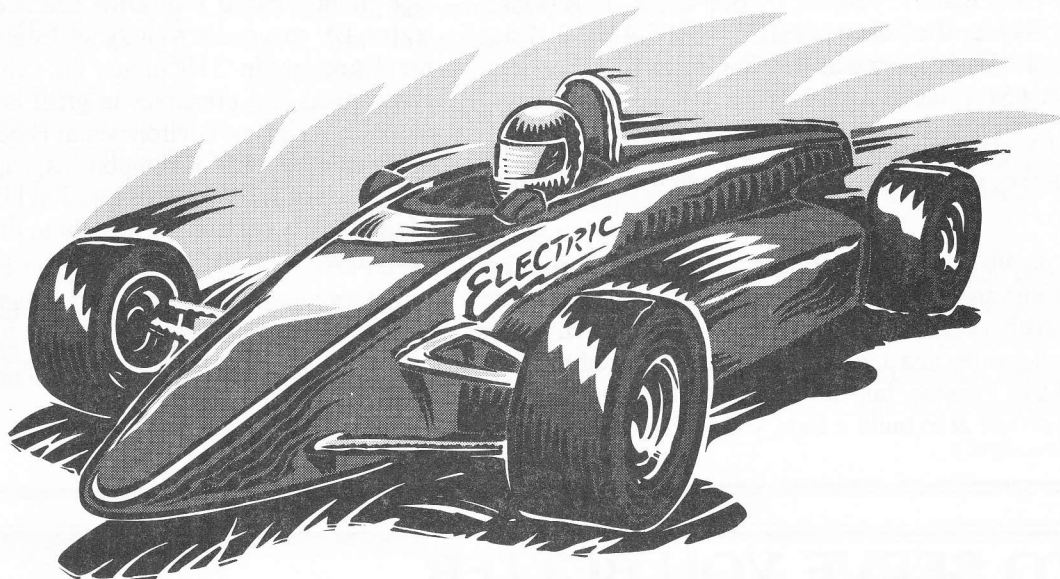
For information on new membership or change of address, please send your requests to:

EAA Membership  
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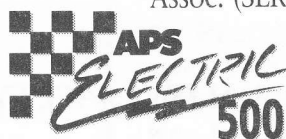
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# Hot EV books!

BY KEN KOCH & CLARE BELL

**Convert It:** A Step By Step Manual for Converting an Internal Combustion Vehicle to Electric Power, by Mike Brown with Shari Prange. 3rd edition Future Books. Copyright 1993 by Electro Automotive, ISBN 1-879857-94-4 Price \$24.95 plus \$3.50 shipping and handling. Electro Automotive, P.O. Box 1113-CI, Felton, CA 95018

**Build Your Own Electric Vehicle**, by Bob Brant, TAB Books. Copyright 1994 by Bob Brant, ISBN 0-8306-4232-3. Price \$27.00 plus \$3.50 shipping and handling from KTA Services, 944 West 21st St. Upland, CA 91786.

These two EV classics would at first glance appear to be competitors, but they differ so much in approach they compliment each other.

**Convert It** distills author Mike Brown's 28 years as a professional mechanic and 14 years of EV conversion experience into an exceptionally practical EV conversion shop manual. Shari Prange's well-written text and photos focus on VW Rabbit, light pickup and 914 Porsche, but can be applied to any car. (Clare Bell used **Convert It** to build a Baja VW.) Prange also gives a

list of essential components so even an EV builder who doesn't use a kit can still build a safe car. The revised 3rd edition includes more photos illustrating points made in the text, and updates covering some newer EV components. There are 6-volt and 12-volt to scale battery (approx) layout dummies to be copied, cut out and used to determine battery interconnect layouts.

Bob Brant's, **Build Your Own Electric Vehicle** is a hardcover text on EV conversion technology by an accomplished EV technical author. In 310 pages he explains EV technology, components and principles in great detail. The book also includes EV history, environmental benefits, organizations, and up-to-date sources for components, supplies and publications. Ken Koch of KTA services and Jim Harris of Zero Emissions Motorcar Co. contributed heavily to this book. It is a must for every EVer's library.

If possible, get both. The cost of the books is probably one of the lesser expenses of an EV project and the information may pay for itself in terms of time and money saved.

—CB and KK

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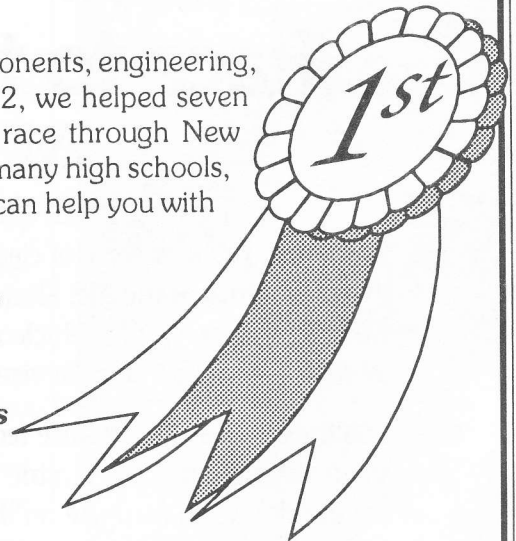
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# Responsible EV Invention

By CLARE BELL

As EV builders seek more power and performance from their cars, they are running up against the limitations of commercial components. One solution is to go back to home-built or specially contracted units. The other is to modify commercial components to stretch their capabilities. This has an up side and a down side. The advantage may be gaining features such as regen braking and performance. The down side is that these components are being used in ways they were not originally designed for.

Recently a controversy developed over an article published in a magazine describing how to modify a PMC 1221B controller for regen braking. Steve Post,

of PMC, asked the editor not to publish this article, but it appeared anyway. The same article was submitted to Current EVents for reprint (at the request of the managing editor, since CE planned to do a Tech Focus issue on regen braking).

CE feels that innovation should be encouraged, but balanced by a sense of responsibility. Thus this issue is running an guest op-ed piece by Shari Prange. "Innovation and Risk" lucidly presents the challenges and concerns as seen from the point of view of an EV components supplier. CE invites comments and opinions from other points of view as well. We will be running the regen issue, but later in the year than originally planned.

— CB

# Houston Hosts EVs

By MARC KOHLER

The third annual South Central Electric Vehicle Consortium (SCEVC) symposium was held at the Hobby Airport Hilton in Houston, Texas on November 2, 1993. SCEVC was formed in 1989 to facilitate the commercialization of EVs in the south central region.

The consortium collects performance data from EVs operating in the region in order to confirm increased operating efficiencies, reduced maintenance and better reliability of EVs versus gas. The symposium was organized by Imran Kakwan of Texas A&M University.

Jack Greenwade, Group Vice President of Operations for Houston Lighting & Power (HL & P), welcomed the attending EV enthusiasts. Jack Compton, also of HL&P, and SCEVC Chairman, opened the symposium.

*Continued on page 14*

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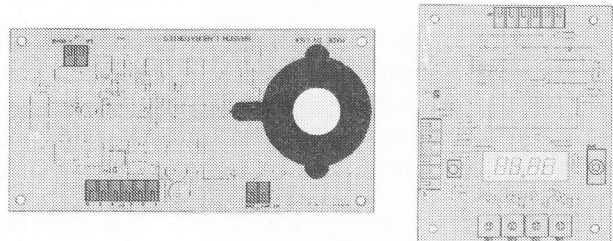


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# Balancing Innovation & Risk

BY SHARI PRANGE

**I**nnovation is at the heart of the electric vehicle. The car itself (despite its long history) is considered an innovation in a petroleum-based world. It attracts innovative people. Within the industry, we are in a state of rapid technological advancement, and many advances have come from lone inventors.

The dilemma we face is this: how do we ensure safety for the EV-driving public without stifling creative talent and the free exchange of ideas? The answer lies in responsible, professional guidelines for innovation.

It is one thing for an individual to design a component or system for his (or her) own personal use, fully anticipating the risks of unanticipated failures. It is something else when that person begins "sharing" his innovation, whether by publishing information or supplying components. At that point, certain responsibilities are incurred.

Before releasing his innovation into the world, inventor has a duty to try to anticipate anything that could possibly go wrong or be done wrong. (Believe me, people are more creative in their mistakes than you can imagine!)

As a professional supplier, I have responsibilities of warranty and liability that a private citizen does not. I am continually supplying parts and information to people thousands of miles away, to whom I have never spoken. It is a sobering thought.

The person receiving the innovation may not understand it as well as the inventor. He may not have the same degree of knowledge or skills in installation. He may not follow directions accurately. He may substitute inappropriate or inferior components, or take other shortcuts. The list of "maybes" is a long one.

It is the responsibility of the inventor to try and anticipate every possible false step, and provide multiple layers of safety to guarantee that any failure occurs in a safe mode. Generally this means that the failure results in the car refusing to start, or ceasing to operate. Failure modes that include fire, explosion, acceleration, loss of control, or similar situations are not acceptable.

An inventor must be wise enough to know how much he doesn't know. If his expertise is in electronics, he should consult heavily with someone who has professional automotive expertise. An electric car is electric and it's a car. To take either aspect lightly is to invite disaster.

The inventor also has a responsibility to the industry. Any EV catastrophe is potentially harmful to us all, not just the immediate victims. Not only will it scare away potential EV users, it might also scare regulatory agencies into mandating how we build our cars. Such mandates born of fear may or may not make sense in the real world.

Catastrophes—or even potential catastrophes—could also scare away the major component manufacturers that we need. In any disaster, lawsuits sprout like mushrooms, and they always target the deepest pockets. They are often won, even if the "deep pocket" was only very indirectly involved. The hobbyist market is only a miniscule drop in the ocean of the profit picture for our manufacturers of motors, controllers, etc. One lawsuit could wipe out every penny of profit they have ever made from hobbyists, or will ever make. If too many people start using components in ways that the manufacturer feels are unsafe, the manufacturer could decide that it simply isn't worth the risk to supply hobbyists at all.

Innovation is certainly a noble goal, and deserves to be honored. It also carries with it an awesome responsibility for safety. To be worthy of the honor, one must accept the responsibility.

## Impact PrEView

*Continued from page 1*

performing small car that GM has ever turned out." ("We Drive the World's Best Electric Car" by Dan McCosh)

New York-based *Popular Science* Magazine will receive an Impact for intensive two-week testing. In a boxed sidebar, the magazine requested questions or comments on the car from its readership to use during the Impact evaluation.

*Pop Sci* is in New York City. Address Impact questions to: Impact Test Drive, *Popular Science*, Two Park Ave. New York, N.Y. 10016. Also see *Motor Trend*, Jan 1994 for more Impact and EV coverage.

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## 80 Mpg car

*Continued from page 1*

computer to detect and alert the driver to pressure losses as low as 5 psi.

In short, this EV is ready to meet the presidential call for a clean, environmentally kind, highly efficient passenger vehicle.

Automotive Industries agrees. With an enthusiasm that is startling for a trade publication that has previously reflected the anti-EV stance of the auto industry, Automotive Industries says "A drive in the Impact 3 puts to rest any doubts about the performance of electric vehicles." In an uphill race between this car and a new Honda del Sol, the Honda's defeat "bordered on humiliating". On the road, the instant full-torque characteristics of the electric drive "give a responsiveness that cannot be achieved in an IC car."

Impact 3, though modified from the original AeroVironment concept, is an excellent electric car. GM has good reasons to put it into full production and price it affordably. Whether or not they will remains to be seen.

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*For more details on Impact technology, see Dec. 1993 Automotive Industries, "Supercar Technology Now!" by Brooke, Kobe and Sawyer, pp. 25. — CB*

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# Board Highlights

The EAA Board met on Dec. 18th, 1993 at Tandem Computer in Cupertino, CA. June Munro (Membership Records) Peter Barnes (TA) and Bill Palmer (previous Board Chair) attended and were welcomed.

## Issues

Some organizational or program changes proposed by members of the new Board conflict with the present text of the By-Laws. Drafts of possible changes to the By-Laws are being prepared for consideration at the March Board meeting in Phoenix, AZ. Policy statements and adherence to Roberts Rules are among those items. The Board is also studying awards, including what types, how to evaluate candidates, identifying categories, and guidelines.

June Munro has sent chapters lists of their members who didn't renew in '93. Peter Barnes has been interviewing EAA drop-outs in the Bay Area why they didn't renew. He will make the results available to Chapter Relations.

## Actions

Peter Hackes of the Electric Grand Prix Association is asking for EAA support, both in terms of funding and speakers, for the April 1994 L.A. Eco Expo, Road Rally and Grand Prix race. EAA cannot offer funding, but can help with speakers and participants. Bruce Brooks moved that the April 1993 Board of Directors meeting be held in L.A. concurrent to the Electric Grand Prix events, providing that a meeting site is available. The motion was seconded by Stan Skokan and passed by a unanimous vote.

Treasurer Mike Slominski reported that the old EAA account is basically closed, with \$6400 transferred to the new account. A small residual has been left in the old account to cover any last-minute checks. EAA has gone from being 15% in debt to breaking even, thanks to the efforts of Bill Palmer over the year 1992. "He got the car out of the ditch and now we're driving it."

EAA will run a classified ad in issues of *Popular Mechanics* or *Popular Science* when they have major articles on the GM Impact or other EVs. The ad's cost is \$168 and copy has been prepared and reviewed. The ad has not been submitted yet, since New Membership wants to prepare their database and budget to handle a possible large influx of new applications.

Access to the 800 number is being moved from area code 415 to 510, so that the Cornells can take 800 calls without incurring toll charges. The toll-free number has had 105 calls in the last 2 months.

The newsletter has gone monthly as of the January 1994 issue. Problems included space constraints due to tighter 16-page format and substantial requests for advertising. Contributors of "bumped" or drastically shortened articles were notified by phone prior to publication.

Text was missing from the listing of Program Committees in the minutes and CE Board Highlights. Under Newsletter Management Committee, the following is being added: "(Bell has no vote on policy)".

The March '94 meeting is scheduled for the Mar. 18-21 time-frame in Phoenix, AZ, contingent with the running of the APS Electric 500 race. Phoenix Chapter will host Board members in private homes.

The April meeting is scheduled for April 7-11 in L.A. to coincide with the running of the Electric Grand Prix. Local chapters may host Board members but details have not yet been worked out.

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# Ways to Keep your EV & your Lover

BY CLARE BELL



Are you doing it out of concern for the environment, energy independence or other socially responsible motivations? Are you doing it to be a pioneer? Or because you just like to build and tinker? Even just having fun is reason enough.

At the same time, think about what in your partner's life is as important as the EV is in yours. What can you do to support his or her interests, concerns, hobbies or whatever? Is she or he a hiker? Craftperson? Party animal? Then hike your heels off, brave the splinters or the crazy-glue and party 'til the bovines come home. Better still, plan to do it in the EV, so it benefits both of you.

Include your partner in the planning stages. Maybe he or she has some ideas or concerns. Is the car going to be obviously different or is it going to blend in with the traffic? You may like dealing with all the attention that EV drivers get, but your partner may not. Or it may be the reverse. Solving this sort of thing might be as easy as using peel-off decals on the windows or magnetic stickers on the doors.

If you go to a local EAA chapter meeting or show where people are giving test rides or drives, invite your partner along. You might discover that it was only unfamiliarity that was making the other person reluctant. Test rides/drives in good EVs have won over skeptical members of the press and public. You may end up with two EVs in the driveway, hers and his!

If you have kids, their enthusiasm can often help. Many children are environmentally aware and concerned. They are often excited and proud when one of their parents choose to drive an EV.

If you are going to build an EV or convert with a kit, here are some hints to avoid turning off your partner:

If you plan to devote nights and weekends, schedule breaks and cut-offs. Working compulsively late into the night is unproductive and frustrating for the EV builder and his or her partner. Making your partner wait while the clock ticks past midnight and you are still struggling and swearing at the wiring does nothing for your love-life. Plan a time to knock off and quit then, even if the temptation to do "just one more thing" is strong. Don't make your partner drag you bodily out of the garage.

Don't let the project devour each and every weekend, either. Make time to do other things with your partner. It will help your relationship and help the project because you will come back to it refreshed.

When the car is ready for the road, teach your partner how to drive it, if they are willing. If he or she is nervous about electricity, show them the safety devices such as fuses or circuit breakers. You can even demonstrate what happens if something does go wrong. If your co-driver knows how to react and what to do, then they will feel much more comfortable. Imagination can make things seem much worse than the reality.

If he or she is afraid of doing something that might accidentally damage the vehicle, show them that EVs are not that fragile. And above all, there is a mishap while your partner is driving the car, don't heap on the blame.

— CB

**S**o you've decided to build or buy an EV. The money is all figured out, you've chosen the car and you are ready to go. The only hang-up is a personal one — what will your wife, lover, significant other, partner or POSSLQ (Person of Opposite Sex Sharing Living Quarters)—think of all this?

It is not a trivial consideration, since spousal or partner resistance to an EV project can sink the entire enterprise. Or if priorities get scrambled, an EV project can strain a marriage or relationship.

## How can you have your EV and your partner too?

Part of being in a relationship is understanding and accepting what is important to another person. If having an EV in your life is important to you, explain why, without getting on a soapbox. Even if your partner doesn't entirely agree, they can empathize and understand.



# Letters to the Editor

To Current EVents editor:

It is time for an in-depth feature article on Amory Lovins' Ultralight vehicle concepts.

Dr. James Lerner  
Sacramento, CA

Dear Dr. Lerner:

We at CE agree. I hope that George Gless' article on the Super-efficient automobile in the Jan '94 issue was what you were looking for. Please let us know your reactions. — CB

Dear EAA,

I have an interest in becoming part of a battery test exchange network, as discussed in the May/June issue. Please contact me in this regard. Thank you.

Paul Davis,  
Black Motors Ltd  
Sedonia, AZ

Dear Mr. Davis:

We've finally got the first battery test service off the ground with Paul Easley in Lodi, CA. The results will be printed soon. If you'd like to start something similar in AZ, maybe we can help, or you can get in contact with various electric vehicle clubs and companies. Eco-Electric in Tucson might be a good contact, as might the Phoenix Chapter of EAA. — CB

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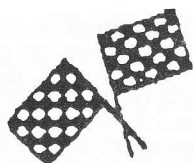
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# Sparks Fly Over EV Regs

By SANTOS GOMEZ (EDITED BY CLARE BELL)

**O**n a recent visit to Southern California, President Clinton pointedly announced his support for California's commitment to introduce pollution-free vehicles by 1998. His announcement could not have come at a better time. The American Automotive Manufacturer's Association — the main lobbying group — is trying to "seek relief in CA [from the ZEV regulations] through all available channels."

In a recent public hearing, the Ozone Transportation Commission (OTC) — representing 12 states from Maine to Virginia — heard the Big Three and environmental regulators disagree on how to clean up auto emissions. The automakers admitted to taking a "take it or leave it" position on their proposal. It calls for building cleaner, more efficient gasoline cars earlier than the federal standards require, but only if the Northeastern states will abandon their plans to adopt CA regulations.

Maine, New York, Massachusetts, Maryland and New Jersey have each separately adopted the CA standards. The remaining member states will not decide whether to follow suit until February 1st 1994.

Unconvinced that the industry proposal will reduce pollution enough for states to meet the federal ozone standard, Northeast state officials feel that CA's ZEV regulations are essential. Unless states do meet ozone emission standards by the end of the decade, they could lose substantial federal funds.

Auto industry officials argue that if the Northeastern states adopt CA's standards, such action increases the industry's regulatory burden without significant air pollution improvement. Automakers will continue EV development if their proposal is accepted by the Northeastern states, however they do not

want to be forced to offer EVs for sale beyond CA's borders.

Despite strong opposition by the Big Three, there has been no opposition from European and Japanese car makers, who are hard at work on EV technology. California officials refuse to back off on the technology now, especially when foreign automakers are verging on a breakthrough.

Other countries are facing the same environmental and energy problems as the U.S. The Department of Energy has estimated \$80 billion in sales for alternative fuel vehicles as a whole by 2010. The domestic automakers will have only themselves to blame if they forfeit a market with awesome potential.

SANTOS GOMEZ IS WITH GOLDSCHN AND GOMEZ, A FIRM OF EV CONSULTANTS IN DAVIS, CA. TEL. (916) 753-8080 OR FAX (916) 753-8057.

## Do More and More Electric Vehicle Regulations Keep Your Head Spinning?

EV incentives, as well as other EV-related laws and regulations, have been called a complicated patchwork by Kateri Callahan, Executive Director of the Electric Transportation Coalition. Issued by the federal government as well as by various states, EV-related policies have become a popular solution to our environmental, energy and economic problems.

Were not complaining and neither should you—these policies are driving the industry and will continue to do so for the remainder of the decade. However, this complicated patchwork is getting more complicated all the time. Those involved in the industry need a resource to sort through this legislative and regulatory mess.

Without an understanding of existing and proposed legislation and regulations, beneficial information regarding incentives cannot be passed on to customers; business tax deductions, emission reduction credits and other benefits cannot be realized; and safety compliance cannot be achieved.

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# News in Brief . . .

*Compiled by Ruth M. Shipley from the Environmental Information Network*

## Studies Confirm EVs Cleaner than Hybrids

EVs produce no direct emissions, but opponents claim they contribute to increased emissions at electric utilities when batteries are recharged.

However, Arizona's Department of Commerce's Energy Office has estimated that operating EVs in Phoenix would cause a net reduction in vehicle-related emissions of 71%. Because the area's powerplants are fueled 66.8% with coal, the finding is significant.

The Northeast States for Coordinated Air Use Management (NESCAUM) examined the impact on emissions of recharging EVs. NESCAUM found that EVs will significantly reduce levels of carbon monoxide, other greenhouse gases and ground level ozone. "Averaging the eight NESCAUM states, the emissions came out extremely low for electric vehicle recharging in the Northeast, magnitudes cleaner than even the cleanest ultra-low emission vehicles," said Sheila Lynch, a NESCAUM consultant.

(GREEN CAR JOURNAL: 10/93)

## No Change in CARB EV Regs—Yet

Following the resignation of Jananne Sharpless as chairwoman of the California Air Resources Board (CARB), automakers hope that the 2% ZEV by 1998 California mandate will be delayed, or at least modified.

However, state officials warn automakers not to hold their breath. "Jan's departure should not indicate any relaxation or desire to back down from the high environmental standards her leadership had set," said James Lee, speaking for the California EPA. "The state and government are committed to ultra-clean and ZEV programs insofar as the technology development keeps pace with it."

Automobile manufacturers who sell over 35,000 vehicles in California are subject to the 2 % by 1998 mandate. GM would have to furnish 6,600 electric cars; Ford, 6,400; Toyota, 3,900; Chrysler, 2,700; Honda, 2,500; Nissan, 1,800; and Mazda, 900.

Ford and Chrysler will wait until next summer for the board's decision. GM has said it needs to consider lead times in order to meet the 1998 date and will therefore move ahead. None of the Big Three indicated that they would cut spending on the project. Japanese manufacturers Toyota, Honda, Nissan and Mazda state they want California to hold firm, since they have already invested heavily in EV development.

(AUTOMOTIVE NEWS: 11/29)

## Light, Affordable EV from Solectria

Solectria of Arlington, MA is planning to introduce a \$15,000 production EV called the Sunrise. Equipped with a sealed, lead-acid battery and made with Kevlar, fiberglass, and carbon fiber, the sub-compact EV should weigh in at a svelte 1400 pounds.

Currently, Solectria produces the Force, an EV modeled after the Geo Metro, and has developed an EV prototype composite named the Flash. Using \$1.1 million from grants, Solectria will manufacture 3 examples of the EV Sunrise and will crash test one. Funding for the project includes 50% from Boston

Edison and the remainder from federal funds channelled through the Northeast Alternative Vehicle Consortium. Northeast states will kick in another \$7 million to develop an EV industry in New England.

(GREEN CAR JOURNAL: 12/93)

## EVs by Peugeot Citroen and Renault

Beginning in 1995, PSA Peugeot Citroen (La Rochelle, France) plans to market 5,000 each of an electric-powered Peugeot 106 and Citroen AX, according to chairman Jacques Calvet. At 20,000 francs, Peugeot must sell 50,000 cars to break even.

*Continued on page 13*

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# Calendar of Events

**Feb. 13-17 - Applied Power Electronics Conference.** Includes EVs, components. At Disney's Contemp. Resort, Orlando, FL (407) 824-3738.

**Mar. 17-20 - 1994 APS Electric 500** at Phoenix International Raceway, Phoenix, AZ. Electric stock A and B, high school entries, Formula Lightning, College Hybrids, ultralights and others. (See May/June issue of Current Events for '93 race coverage). Contact Solar and Electric Racing Association (SERA). The '94 rulebook is out now! Tel. (602) 953-6672. Fax. (602) 953-7733.

**April 24 - Sun Day 1994.** Nation-wide activities celebrating renewable energy, energy conservation, efficiency and sustainability. Includes transport, which means EVs. Fifty environmental organizations involved. Contact Ken Bossong, Tel. (301) 270-2258, fax. (301) 891-2866.

**March 26-27 - SunDay Challenge '94,** Florida. Alternative Energy Vehicle Rally goes from Universal Studios to Cocoa Beach. Run by Florida Solar Energy Center in conjunction with IEEE's Southcon '94. Contact Bill Young (407) 783-0300, ext. 137. Fax (407) 783-2571.

**April 11-13 - Renew '94.** Sheraton Stamford Hotel, Stamford, CT. A two day conference on the benefits of renewable energy to the economy and environment. Sponsored by U.S. Dept of Energy, Northeast Utilities and Niagra Mohawk Power Co. For information, contact NESEA, (413) 774-6051.

**April 7-10 - Int'l Electric Grand Prix World Clean Air Road Rally.** Largest gathering of alt. energy vehicles. Starts at LA ECO Expo and challenges daunting traffic and road conditions of 21 Southern Calif. cities. Heavy media coverage. For more info, call Peter Hackes at 310-430-9779.

**April 8-10 - 4th Los Angeles Eco Expo,** Los Angeles, CA. For info. on show or exhibiting, call 818-906-2700.

**April 16 - Edison Electric Grand Prix,** Long Beach, CA. For more info, call Peter Hackes at 310-430-9779.

**Apr. 17 - Friends of the Anzar Hills** is hosting a fundraising event and would like to have 10 EVs display there. South of San Jose, in Aromas, CA. Contact Henry Gonzales (408) 944-0800.

**Early May - Lightings race at Richmond** International Raceway, Richmond, Virginia. High school competition.

SERA has not set the exact date yet, but stay tuned. Solar and Electric Racing Association (SERA) Tel. (602) 953-6672. Fax (602) 953-7733.

**May-June - Eyes of the Classics,** held at the FORD estate. Display of antique and Indy cars, etc. They would like to invite 15 electric cars of show quality. For information, call Steve Pasteiner (313) 852-2900.

**May 21-28 - 1994 American Tour do Sol.** This classic Event will start in New York City and run to Philadelphia, PA. For more information, contact Nancy Hazard, NESEA, 23 Ames St. Greenfield, MA 01301. Tel. (413) 774-6051. Fax. (413) 774-6053.

**July 8-10 - Formula Lightning support race** to IndyCar Cleveland Grand Prix. Burke Lakefront Airport, Cleveland, OH. Collegiate teams competing, including battery exchange pit stops. For more info, contact Kevon Makell, Centerior Energy, Cleveland, OH. Tel. 447-3552. Try SERA (602) 953-6672.

**June 20-24 - 10th World Hydrogen Energy Conference,** Cocoa Beach, FL. For more info, contact Carolyn Burby, Florida Solar Energy Center, Tel. (407) 783-0300.

**Aug 7-21 Ener-Run III** - This rally for alternate fuel vehicles begins in Hardy. For more information, contact Ener-Run, Inc. P.O. Box 665, Hardy, AR 72542. Tel. (501) 856-3877.

**Dec. 1-7 - EVS-12 1994** at the Disneyland Hotel and Convention Center, Anaheim, CA. Includes an electric Vehicle parade, press events, expo and conference. Display space, \$25/sq. ft indoors, \$12/sq. ft outdoors. Contact SHO, 167 South San Antonio Road, Suite 10, Los Altos, CA 94022. Tel. (415)-949-2050.

**October - Sustainable Transportation S/EV 93.** The NorthEast Sustainable Energy Association (NESEA) will host a series of workshops and a trade show at the Ramada Hotel and Rolling Green, Andover, MA. This is the one that the Big Three bring cars to! Exact date not set. Contact NESEA for more information. Tel. (413) 774-6051. Fax (413) 774-6053

**To list Events or for more information on Events, contact Anna Cornell, (510) 685-7580.** Thanks to EVOSC, SERA, SEVA (Sacramento and Seattle Electric Vehicle Associations) and NESEA for calendar items.

# Chapter News

By RUTH M. SHIPLEY

## NOPEC in Nepal

NOPEC member Burton Gabriel has been using his idealism and expertise overseas in Nepal. He and Jeff Clearwater of Olympia brought parts and batteries to convert a Chinese-built three-wheel Tempu diesel taxi to electric. Kathmandu, Nepal's capital city, has mostly older vehicles with no emissions controls, and air quality at street level that is worse than Mexico City.

In two weeks at the Tapatali Campus in Kathmandu, Gabriel and Clearwater did the conversion and trained six Nepalese students and instructors in how to do it. The Tempu's 10 hp diesel was replaced by an 8 hp K-91 Advanced DC electric motor using an adaptor plate from Gabriel Marine. Ten U.S. Battery 2200's and a PMC controller (both donated from the companies), provided a strong 60 volt system. The vehicle's performance was better than it had been with the original engine.

The project was facilitated by Global Resources Institute and funded by USAID with assistance from NOPEC member Miguel Denker. Global Resources has also aided the construction of a photovoltaic plant in Nepal, so that the converted Tempus can charge off solar cells built in their home country.

*(Thanks to NOPEC News)*

## Peninsula, San Francisco, CA

Approximately 30 people turned out for the chapter Christmas luncheon. A nominating committee is trying to find a replacement for President Mike Slominski, who was elected to the National Board of Directors this year. The Peninsula chapter may distribute promotional items to other chapters on behalf of the Board.

## Vancouver, BC

The Vancouver EVA (VEVA) has designed a logo that includes the Canadian maple leaf superimposed on an electric "bolt". They will sell these crests embroidered on a patch for \$5.00, as well as polo shirts containing the logo. They are working on an original 1912 Detroit Electric which they say is in very good condition. They also produce a newsletter. VEVA reports that a member converted the pickup truck used by BC Environment Minister Moe Sihota, who has proposed that BC, Washington and Oregon adopt the toughest smog standards in the world.

*—(addition by CB)*

Send contributions to:

Ruth M. Shipley, 102 Brighton Rd. #3  
Pacifica CA 94044 (415) 359-1541  
CompuServe 73043,60  
Internet 73043.60@compuserve.com

## EIN

*Continued from page 11*

Fleets of EVs have already been used in La Rochelle, with Electricite de France providing recharging stations. Peugeot is entering its second phase, during which 30 individuals and 20 company and government representatives will drive the company's EVs for 18 months.

Regie Nationale des Usines Renault has also joined the EV market. Currently, its Express and Master utility EVs are being tested by EDP, the post office, Air France fleets and municipalities. By 1994, Renault may launch an EV modeled after its Clio.

(REUTERS: 12/13)

## Member Want Ads

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**FOR SALE: HARBILT Electric Postal Van**. Needs batteries. Electric motor, controller, chassis, fiberglass shell. \$450/as is. Call Stan Hanel (415) 364-5956 or beeper (415) 804-8013.

**FOR SALE: Rabbit Conversion**. 96 V Lister charger and "Cornell" 10 lb electronic onboard charger, recessed battery boxes, power brakes and electric windshield defroster. \$5,500. (415) 323-4878.

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## Houston Hosts EVs

*Continued from page 5*

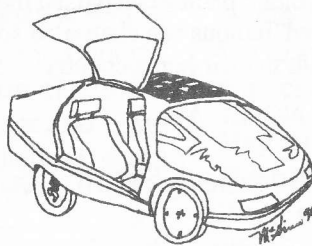
He explained that Houston shares the same air pollution problems as New York and Los Angeles, and mentioned the irony that a city so dominated by the oil industry is leading the way with EVs.

Bob Davis, the Executive Engineer of Chrysler Corporation's EV Program, invited people to take a drive in a Houston Light and Power TE Van parked outside.

Edward Bass, Senior Research Engineer for the Southwest Research Institute spoke on his hybrid research program, including a Bonneville land-speed record attempt EV that reached 109 mph despite wet and sludgy conditions.

Dr. David Swan, assistant director for the Institute of Transportation Studies at U.C. Davis, is currently developing fuel cells for passenger cars. Swan is both a sportscar and EV enthusiast and likes the idea of joining the two. He has an extensive background in lead-acid and zinc-bromine battery technology.

Swan presented slides of different EV design concepts from both Europe and the US. He made the point that the European market has different needs and demands than the US. Contact CE for a complete list of speakers and subjects.



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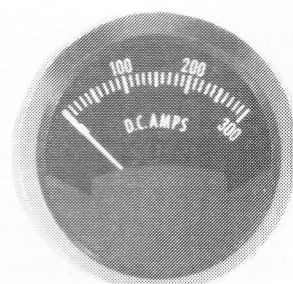
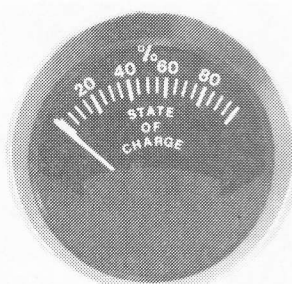
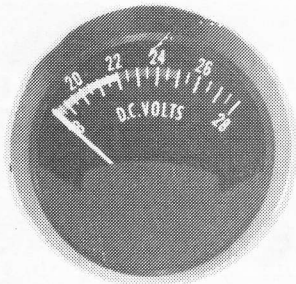


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