



Commercializing Plug-In Hybrids

Felix Kramer, Founder fkramer@calcars.org
The California Cars Initiative

*see this presentation at CalCars.org "About" page
(and at www.edtaconference.org)
December 8, 2005*





This story **starts** with technology

It progresses to the multiple forces that will get
an OEM to build production plug-in hybrids





2002-2005 challenge: raising visibility and positioning the PHEV solution

**100+MPG plug-in hybrids:
all-electric daily driving;
gas for unlimited range**

Gasoline:
\$2-7/gallon,
imported,
higher emissions
(replaceable with biofuels)

Electricity:
under \$1/gallon equiv,
domestic,
cleaner, lower CO2
(increasingly renewable)





Drivers want
freedom
on the open road

*Technology Lead
Ron Gremban with
PRIUS+ passing
Oregon's Mt. Hood*





PIONEERS:
UC Davis/EPRI/HEV Working Group
Prius “EV button:” inspiration Oct. '03





CalCars: we'll convert Prius April '04





Open-source style volunteer project





Conversion debugged Nov. '04





Li-Ion version by EnergyCS Apr. '05



*Greg Hanssen,
Pete Nortman
of EnergyCS,
Mark Kohler
of Valence
Technology
(lower right)*





PRIUS+ meets *NYTimes*: Michigan Feb. '05



THOMAS L. FRIEDMAN

*As
Toyota
Goes . . .*

producing the green technologies that the world will desperately need as China and India industrialize — is so irresponsible that it takes your breath away. This is especially true when you realize that *the solutions to our problems are already here.*

As Gal Luft, co-chairman of the Set America Free coalition, a bipartisan alliance of national security, labor, environmental and religious groups that believe reducing oil consumption is a national priority, points out: the majority of U.S. oil imports go to fueling the transport sector — pri-

Hybrid-Car Tinkerers Scoff at No-Plug-In Rule

By **DANNY HAKIM**

group based in Palo Alto, Calif. He gets 40 to 45 miles per gallon driving his normal

building them in garages. "All of the relevant technology is





Media wave spring '05



FREE VIDEO



• Plug-in hybrids
 Aug. 15: WNBC-TV's Chuck Scarborough looks at the experimental plug-in Prius and its backers' hopes for a wider car audience.

Launch

MSNBC

gasoline usage for the first few miles every day," G





PRIUS+ touring ever since



*Seattle City Hall: Felix Kramer and Ron Gremban, CalCars
Steven Lough, Seattle Electric Vehicle Assn*





PHEVs gain new streams of support

Business

1. Converters
2. Utilities + public fleets
3. Component suppliers
4. Private incentives
5. Job training programs

Public

6. Energy security groups
7. Gov't./policy endorsers
8. EV community
9. Civic groups + the public
10. Congress





BUSINESS

1 EnergyCS + Clean-Tech = EDrive, LLC



*Greg Hanssen,
Seth Seaberg,
Felix Kramer:
EDrive's 2nd
Prius gains
attention at
Clean Cities
Conference,
Palm Springs*





2 City/county/state/corporate fleets: conditional purchase orders



Plug-In Austin

Building a Market for Gas-Optional Hybrids

According to an increasing number of policy makers, industry analysts, and environmental groups, there is a growing awareness of a *Perfect Storm* of conditions that may change how we drive and what we drive.

This perfect storm of strategic, economic, and environmental conditions compels us to find ways, within a relatively short period of time, to dramatically reduce oil consumption.

Plug-In Hybrid Vehicles

The Plug-in Hybrid Electric Vehicle (PHEV) is a gas-optional vehicle that offers a viable alternative to petroleum dependant transportation.





3 Component suppliers form trade assn.



ACCELERATING ADVANCED HYBRID TECHNOLOGY INTO THE MARKETPLACE

HybridConsortium.org
Plug-In Hybrid Development Consortium

ABOUT THE CONSORTIUM
PHEV-DUAL MODE HYBRID
MEMBERS
NEWS & MEDIA
RELATED LINKS
CONTACTS

We're Working on the Next Generation Hybrid.

"This consortium will help American automakers become more competitive by accelerating the development of new technologies necessary for the next generation of hybrid vehicles."

Senator Orrin Hatch

Fact.
A Department of Transportation study shows that most cars drive less than 50 miles a day on average.* A dual-mode hybrid car...





4 Private incentive programs take off



DRIVE CLEAN
TO DRIVE CHANGE

At Hyperion we believe companies and individuals can make a difference. Central to our





5 Trainers see jobs in hybrid technologies



*South Seattle
Community
College*





PUBLIC

6 Energy security “hawks” join in

SET AMERICA FREE
Cut dependence on foreign oil. Secure America.

Home Who we are News Get the facts Get involved

More fuel choice = less dependence on foreign oil

Click on each type of fuel to learn more.

The graphic displays three fuel options: Methanol, Gasoline, and P-Series. Arrows from these options point to a red SUV, and a power plug is also shown with an arrow pointing towards the vehicle, suggesting alternative energy sources.





7 Former CIA Director James Woolsey, former Secretary of State George Shultz



*Executive
Simulations:
SecureEnergy.org
“Oil Shockwave” in
DC and LA include
former Dem. and
Repub. officials*





8 Attitudes evolve in EV community

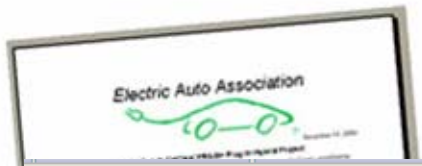
CONTACT US | HOME

EAA
The Electric Auto Association

Electric Vehicles (EVs) Are Your Clean, Quiet, Efficient Transportation Choice

The EAA salutes the effort and sacrifice made by the members of the Sacramento vigil. The efforts by these volunteers derailed Ford Motor Company's plans and reclaimed functioning EVs from the crusher. [click for details](#)

EAA Funds **CalCars'** PRIUS+ Plug-in Hybrid Project



PlugInAmerica.com Promoting Plug-In Cars

- DON'T CRUSH LINDA'S CAR!
- ELECTRIC CAR FACTS
- TAKE ACTION & EVENTS
- WHAT LEADERS SAY
- DONATE
- PHOTO GALLERY

SAVED
Toyota RAV4 EV

EDTA: **CONNECTING TO THE GRID: Benefits and Viability of PHEVs**
In Partnership with EPRI and EV World



9 California AAA sponsors CalCars PRIUS+ at SF International Auto Show





10 Washington, DC notices PHEVs

Hatch Reintroduces CLEAR ACT to Promote Alt-Fuel, Hybrid and Electric Vehicles

29 APRIL 2005

Senator Orrin Hatch (R-Utah), supported by a coalition of environmental groups, automakers, and alternative fuel associations, re-introduced to Congress for the third time the CLEAR ACT—Clean Efficient Automobiles Resulting from Advanced Car Technologies.



na
Obama Says Provision in Energy Bill to Double Ethanol Use, Invest in Clean Coal Will Help Illinois
Tuesday, June 29, 2005

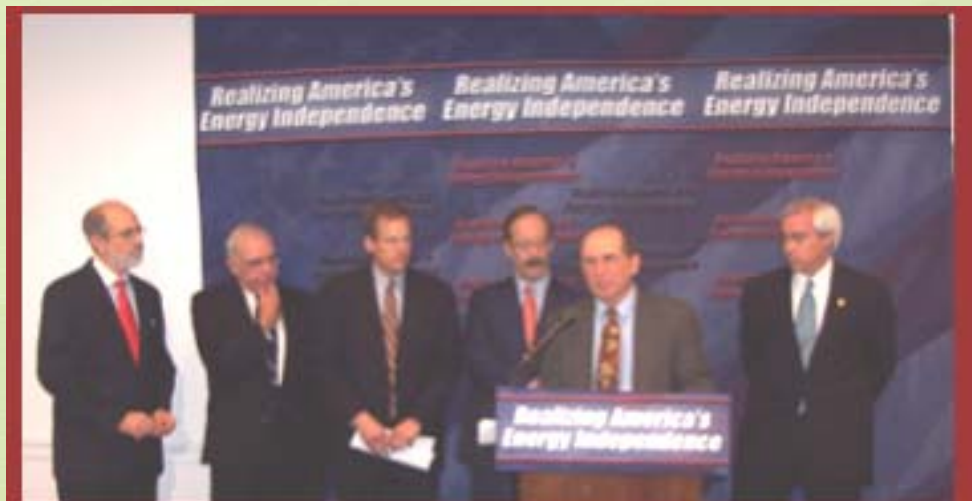




Bi-partisan Congressional coalition endorses flex-fuel plug-in hybrids: Fuel Choices for American Security Act



From left, Sens. Joseph I. Lieberman (D-Conn.), Ken Salazar (D-Colo.), Lindsey O. Graham (R-S.C.) and Jeff Sessions (R-Ala.) discuss energy security legislation yesterday on Capitol Hill. (By Dennis Cook – Associated Press)



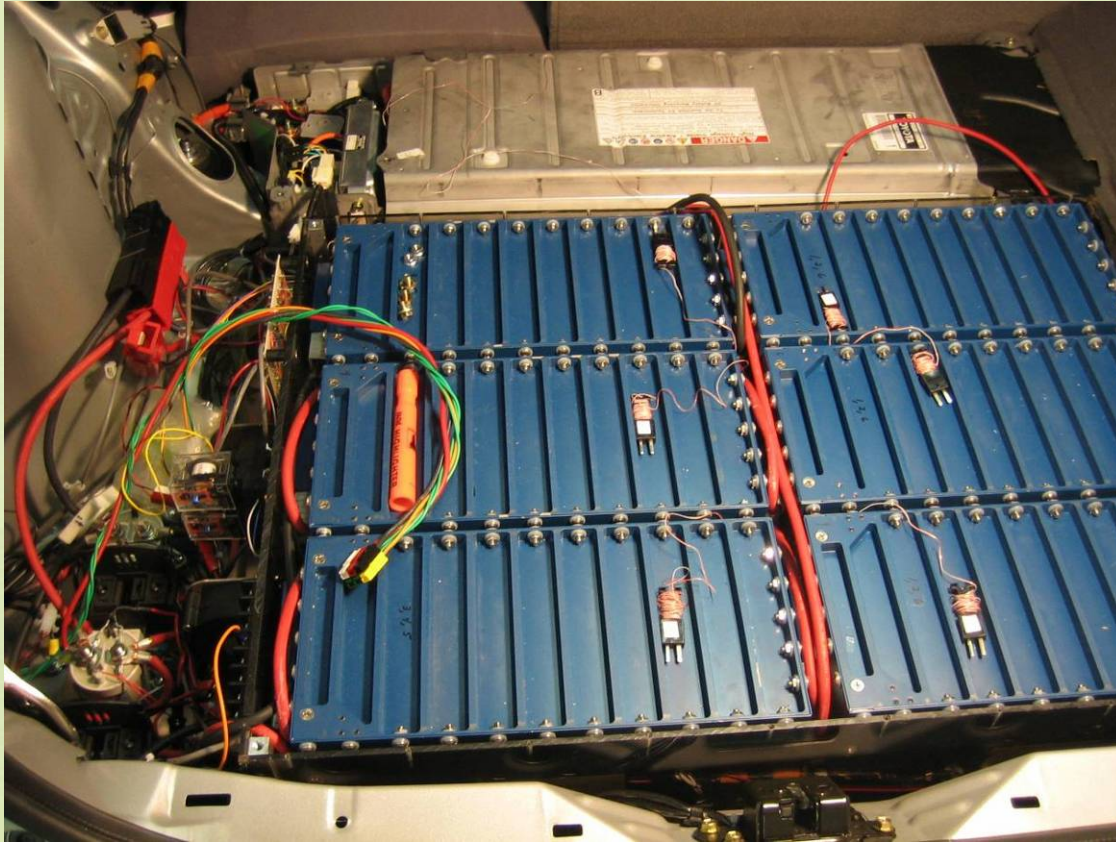
Frank Gaffney, Rep. Jim Saxton (R-NJ), Rep. Jack Kingston (R-GA), Rep. Eliot Engel (D-NY), Rep. Wayne Gilchrest (R-MD), Rep. John Barrow (D-GA)





CALCARS

Continuing prototype projects



- *Electro Energy Inc. bi-polar NiMH now in development/ evaluation for Prius and other platforms.*
- *Li-ion in discussion*





Strategy: work with OEMs as Qualified Vehicle Modifier (QVM)





We educate, advocate and partner



Power, Plugs and People

by Felix Kramer

Felix is an entrepreneur with a life-long green streak. He enjoys communicating his enthusiasm about what's new, unique, and significant. He's the founder of [CalCars.org](#), [The California Cars Initiative](#), and has been promoting 99+ MPG plug-in hybrids full-time since 2001. He posts his own selection of significant developments for PHEVs at the [CalCars News Archive](#).

- > [Hurricanes and Global Warming: Some Starting Points](#)
- > [10 Talking Points for Plug-In Hybrids](#)
- > [Preparedness After Katrina](#)

How Plug-in Hybrids Tackle National Security, Jobs and Global Warming at the Same Time

... better, cleaner.

Felix Kramer
 Founder of CalCars.org
 The California Cars Initiative

Thursday, September 22, 2005
 4:00-5:00 pm

...ed communities have enormous potential power. We have
 ... So online hybrid fans, buckle up for a wild adventure. As I
 ... "Fasten your seatbelts. It's going to be a bumpy night."

... of this inaugural posting appears at [AlterNet](#).

| [Comments \(83\)](#) | [Subscribe to Blog](#)





Subscribe to low-traffic CalCars-News for latest info (sign up at CalCars.org)

[James Woolsey testimony to Senate Foreign Relation](#)

We've included below the second half of the testimony (the first

[Int'l EDTA Conf/Expo Vancouver Dec. 6-8 expands PH](#)

The international Electric Drive Transportation Association .

[9 up-to-date PHEV papers online from APPA Symposium](#)

Excellent long weekend reading: ...

[Full list of sponsors of Senate & House Fuel Choices leg](#)

This update, from SetAmericaFree.org, can also be viewed (with

[Minn. Star-Tribune: US Racing the Clock to Find Altern](#)

Includes comment on PHEVs from former head of Ford's hybrid

[Green Car Congress report on LA APPA meeting](#)

See URL also for comments on this blog entry ...





Join us!

100+ MPG
Hybrids!
www.calcars.org
better, cleaner. I'm a Charter Sponsor of the California Cars Initiative

info@calcars.org

*See this presentation at CalCars.org "About" page
(and at www.edtaconference.org)*

