

EV WORLD INSIDER

EDITION 11.08

Weekly Review of News from the World of Electric Vehicles

MOBILE



SHELL'S ZONE OF UNCERTAINTY
'Signal & Signposts' report supports EVs

WHERE THE EVs WILL BE... MAYBE
CAR Group projects their numbers and locations by 2015.

**FIRST WE CLEAN UP THE CARS, THEN
THE GRID**
Here's the solution to the 'chicken & egg' problem.

KRAMER V. KRAMER
First American family to own LEAF and Volt

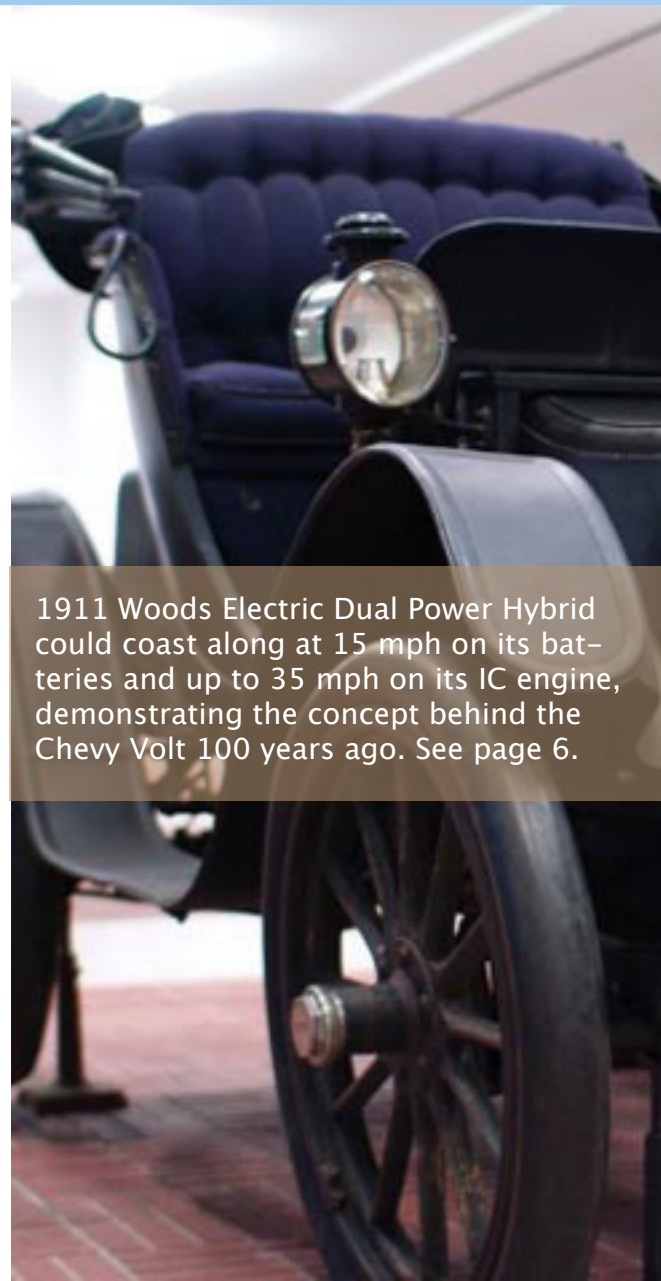
EVs and the U. S. President's FY 2012 Budget

If you're an American politician whose biggest campaign contributors come from the oil, gas and coal industry, you're not going to be very happy with President Obama's proposed federal budget. I am sure your private cellphone number is buzzing with worried, angry businessmen and potentates from Charleston to Wichita to Houston.

The cause of their concern can be found in the Energy Department section of the White House's Fiscal Year 2012 Budget. [<http://www.whitehouse.gov/sites/default/files/omb/budget/fy2012/assets/energy.pdf>]

"Consistent with the Administration's Government-wide effort to identify areas for savings, the Budget eliminates inefficient fossil fuel subsidies that impede investment in clean energy sources and undermine efforts to address the threat of climate change. Approximately \$4 billion per year in tax subsidies to oil, gas, and other fos-

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1911 Woods Electric Dual Power Hybrid could coast along at 15 mph on its batteries and up to 35 mph on its IC engine, demonstrating the concept behind the Chevy Volt 100 years ago. See page 6.

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Photo of the Week

Dirk Gion and Stefan Simmerer took on the vast Australian continent in a tiny, two seat electric car they recharged each day with a portable wind turbine they carried with them. In addition to the wind generator, they also occasionally used a kite to provide additional thrust, though the stress wore out their front tires faster, forcing them to be replaced every 100 km.



Wind-Explorer team set up portable wind generator that they used to recharge their electric car each night.

Wind-Explorer Completes Australian Adventure

Between the winds of Australia and AUD\$10 of electric power purchased off the grid, two German adventurers were able to cross the entire length of Australia in an electric car.

Dirk Gion and Stefan Simmerer completed the 5000 km journey from Perth to Sydney, Australia in their tiny, open cockpit electric car, dubbed the Wind-Explorer. The pair charged the vehicle's lithium-ion batteries from a small wind turbine they set up each night using a portable tower that stowed underneath the vehicle.

The team also used a small sky sail to provide additional assist and to help locate areas with sufficient winds to set up the turbine. The vehicle has a maximum speed of 80 km/hr (49 mph) and weighs 200 kg, including the wind turbine and tower tubing. Their trip is chronicled at Wind-Explorer.com.



FY2012 Budget continued...

oil fuel producers are proposed for repeal.

“Inefficient?” Man, that’s got to sting.

How many billions in profits did the industry earn last year? Like they need \$4 billion in additional government welfare.

In their place, the President is proposing is a series of funding measures, including increasing the Energy Department budget by 12% to \$29.5 billion, that focus on innovation and conservation. Here is how it’s broken down:

- Doubles the number of Energy Innovation Hubs, adding three areas of research to focus on critical materials including rare earth materials, battery and energy storage, and new grid technologies and systems to help Smart Grid and improve energy transmission efficiency.
- Positions the United States to lead in the clean energy economy by providing \$5.4 billion for long-term research and development at the Office of Science and \$550 million for the Advanced Research Projects Agency–Energy.
- Makes a significant commitment to U.S. energy technology leadership, more than doubling energy efficiency research, development, and deployment and increasing renewable energy investments by over 70 percent.
- Initiates a public-private effort to reduce energy usage in our Nation’s commercial buildings by 20 percent by 2020. The Department of Energy’s programs include a “Race to Green” grant competition and a pilot program to provide retrofit loan guarantees that will focus on universities and hospitals. These programs complement an expanded and redesigned tax

incentive for commercial building upgrades.

- Helps reach the goal of one million advanced technology vehicles on the road by 2015 through more than \$580 million to assist in research and development, a competitive grant program to support deployment in communities across the country, and enhancements to the existing electric vehicle tax incentive.
- Increases the percentage of electricity produced by clean energy sources by encouraging early commercial deployment of innovative clean energy technologies with additional loan guarantee support for nuclear power plants and innovative energy efficiency and renewable energy projects. This financing support complements tax incentives (e.g., Section 1603 grants and Section 48c credits) for renewable energy generation and manufacturing.

Obviously the White House is investing heavily in electric vehicle technology at the expense, critics contend, of ‘clean diesel’ and fuel cell technology, among others. The first bullet point in Energy Department’s budget acknowledges the need to find alternatives to China’s monopoly in rare earth elements and other related strategic materials. The budget also continues to fund battery and energy storage research, presumably for both mobile and stationary applications. It allocates \$580 million for R&D and a competitive grant program to assist winning communities in the shift to electric drive vehicles, including turning the \$7,500 tax credit into an instant rebate at the time of vehicle purchase. Electric cars aren’t the only

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FY2012 Budget continued...

area of interest in FY 2012. Under the Department of Transportation, Obama is proposing to allocate \$53 billion for high-speed rail over the next six years, in addition to the \$8 billion already authorized. States the Department of Transportation's budget...

For the first time ever, the Administration proposes to include intercity passenger rail programs in the multi-year reauthorization proposal. The goal is to provide 80 percent of Americans with convenient access to a passenger rail system, featuring high-speed service, within 25 years. The Budget provides \$53 billion over six years to fund the development of high-speed rail and other passenger rail programs as part of an integrated national strategy. This includes merging Amtrak's stand-alone subsidies into the high-speed rail program as part of a larger, competitive System Preservation initiative.

Critics of the President lament that we can't afford such grandiose plans. We're horribly in debt, from individual families whose homes aren't worth what they paid for them to our cities, our states and the nation as a whole. America is, they argue, effectively "bankrupt" and as any credit counselor will tell you, the best way to get out of debt is to stop digging yourself in deeper. Makes sense, I suppose. Pity we didn't bother to consider that when we launched the needless war on Iraq, which the previous administration refused to put on the budget.

I look at this situation like one of those old aristocrat families in England who own

some huge baronial mansion and vast tracks of land around it, built when the Sun proverbially never set on the Empire; when the wealth of India and Africa and South America poured into that tiny green island across the English Channel. I actually attended my last two years of undergraduate school on just such an estate some 30 miles north of London that was owned by a wealthy merchant who made his fortune, I am told, from Indian jute. That school has since been turned into an employee training center by HSBC: Hongkong Shanghai Banking Corporation.

Back to my fictional Edwardian English aristocrats. The family is broke, its mansion in serious need of repair, and its trust fund babies up in arms. One side of the family argues that servants fired, vast tracks of the estate sold off, maybe even some priceless paintings auctioned off in order to preserve some vestige of the family's past.

The other side of the family contends that just holding on to the past only prolongs the inevitable. Instead, the family needs to think 'outside the box' and come up with innovative ways to generate income in keeping with the times. Yes, let's cut out the unnecessary expenses like the fleet of luxury cars parked out in grandfather's garage. Instead, let's use some of the savings to reduce the mansion's enormous energy bill in insulating it better and replacing the windows. Better yet, how about we think about re-purposing the estate, perhaps turning some of expansive flower beds into organic garden plots and hosting a weekly farmer's market for the community, while attracting more tourists. Let's talk to our family banker, they argue, and purpose to convert the outlying stables into a vocational training

FY2012 Budget continued...

center for energy efficiency retrofitters. Yes, it would mean adding to the family's already sizable overdraft, but this enterprise, unlike simply maintaining the status quo, would be funded by a percentage of the savings customers would realize on their own energy bills. It's risky, yes, but it also offers the opportunity to start filling in the family debt hole, capitalizing

on the realization that energy costs are and will be on the rise for the foreseeable future.

Incidentally, there was just such a British TV series about ten years ago built exactly around this premise called "Monarch of the Glen."

Like that fictional family, we have to decide whether we simply want to prolong the inevitable or invest in the future. As you can imagine, I am for the latter.

High-speed Rail on the Cheap?

Just when China was prepared to lay claim to the world's most extensive and advanced high-speed rail system, we learn that things may not be as copacetic as they appear. Liu Zhijun, the chief of the Chinese Railways Ministry has been fired for corruption. The speculation is that in his push to build some 8,100 miles of HSR, plus another 11,000 miles of conventional rail lines, he may have cut corners in potentially dangerous ways.

The New York Times is reporting that the cost per miles in China was \$15 million, where a comparable system in the USA could run between \$40-80 million per mile. The fear is that contractors did it by skimping on the quality of the concrete supports. Japan railway officials also are warning the Chinese are running their trains 25 mph faster than advised. [http://www.nytimes.com/2011/02/18/world/asia/18rail.html?_r=1].





What's Old Isn't Good Enough

Not surprisingly, so is George W. Bush's former deputy assistant, Bradley A. Blakeman. Writing an OpEd piece that appeared on Fox News [<http://ewworld.com/news.cfm?newsid=25225>], of call places, he writes, "President Obama's latest budget supports putting 1 million electric cars on the road by 2015. The plan, however, could just as well been hatched by President Theodore Roosevelt."

"Today, with gasoline prices soaring, there is a call for alternative, clean and affordable electric and hybrid vehicles -- and so they are now being resurrected. America, through General Motors, is breathing life back into electric/gasoline hybrid with the introduction of the Chevrolet Volt."

After summarizing the state of EV technology circa 1910, Blakeman concludes by noting that if Henry Ford visited one of his plants today, he'd be both amazed and "shocked." Amazed by the complexity of his once-simple machine, and "disappointed that so little has changed in the 170 years or so since the invention of the internal combustion engine he manufactured." He writes...

"What's old is new again is not acceptable. The next great advancement in the operation of the automobile is long overdue.

"The country that can develop the next generation to clean and affordable people moving will not only change the world, but will prosper like no other.

"The greatness of America has always been our ingenuity and our ability to invent not just for ourselves, but for everyone else, as well.

"America must continue to lead, and today the need is to lead in the development and production of a clean and affordable energy and products.

"The goal of clean and affordable energy is not partisan, it is American."

I'm not sure about the 170 years part; didn't Gottlieb Daimler invent what we today recognize as the modern gasoline IC engine around 1885? That would make it 126 years, right? Still, I agree with the gist of his argument. Karl Benz might have invented the automobile, but America turned them into the engines of growth, for both good and ill.



Nigerian youth play at what is said to be an abandoned Shell facility. Nigeria is Africa's leading oil producing nation and one of America's top suppliers.

Shell's 'Zone of Uncertainty'

Last week, the Wall Street Journal reported that Exxon Mobil is finding it harder to discover new replacement fields for their dwindling reserves [<http://tinyurl.com/WJS Exxon>].

"In its closely watched annual financial report released Tuesday, the company said that for every 100 barrels it has pumped out of the earth over the past decade, it has replaced only 95," stated the Journal. "It's a conundrum shared by most of the other large Western oil-producing companies, which are finding most accessible oil fields were tapped long ago, while promising new regions are proving technologically and politically challenging."

On the heels of the Journal's story comes Shell's newest energy scenarios report, this year entitled, "Signals and Signposts" [<http://tinyurl.com/RSshell01L>], in which CEO Peter Voser writes, "Over the next four decades, the world's energy system will see profound developments. Heightened collaboration between civil society and the public and private sectors is vital if we want to address economic, energy and environmental challenges."

For the first time, Shell adds a new "but unlikely" scenario, Depression 2.0, highlighted by what the report calls the "Zone of Uncertainty," which they define as the gap between

Uncertainty concluded

energy supply growth and demand, a gap they estimate will be equivalent to 400 EJ (exajoules) of energy annually, an amount “the size of the whole industry in 2000.” Shell asks “Is this a Zone of Extraordinary Opportunity of Extraordinary Misery?”

Writes Jeremy Bentham, Shell’s VP Business Environment, “The policies in place in the next five years shape investment for the next ten years, which largely shape the global energy picture out to 2050.” And what should those policies be? In the area of urban development, for example, the report states...

“Energy, resources and infrastructure companies face a significant opportunity to innovate

in new supply chains for an increasingly urban world. But they also face major up-front investment costs. Already multinational companies like IBM and Siemens have reshaped their organizations for the urban world in an effort to capture market demands for urban mass-transit systems, electric mobility, energy efficient heating and power schemes, and high-speed information technologies.

Don’t you find it interesting that oil companies, carmakers, and both Democratic and Republican administrations all seem to reach the same conclusion that electric mobility is the direction we must go as a society, as a planet? Anyway, the report is a fascinating read, one you may wish to peruse when you have some spare time.

BELOW: Chart reproduced from ‘Signals & Signposts’ showing growing energy demand in developing world.

Chart 2. World-Total Primary Energy Demand - By Region

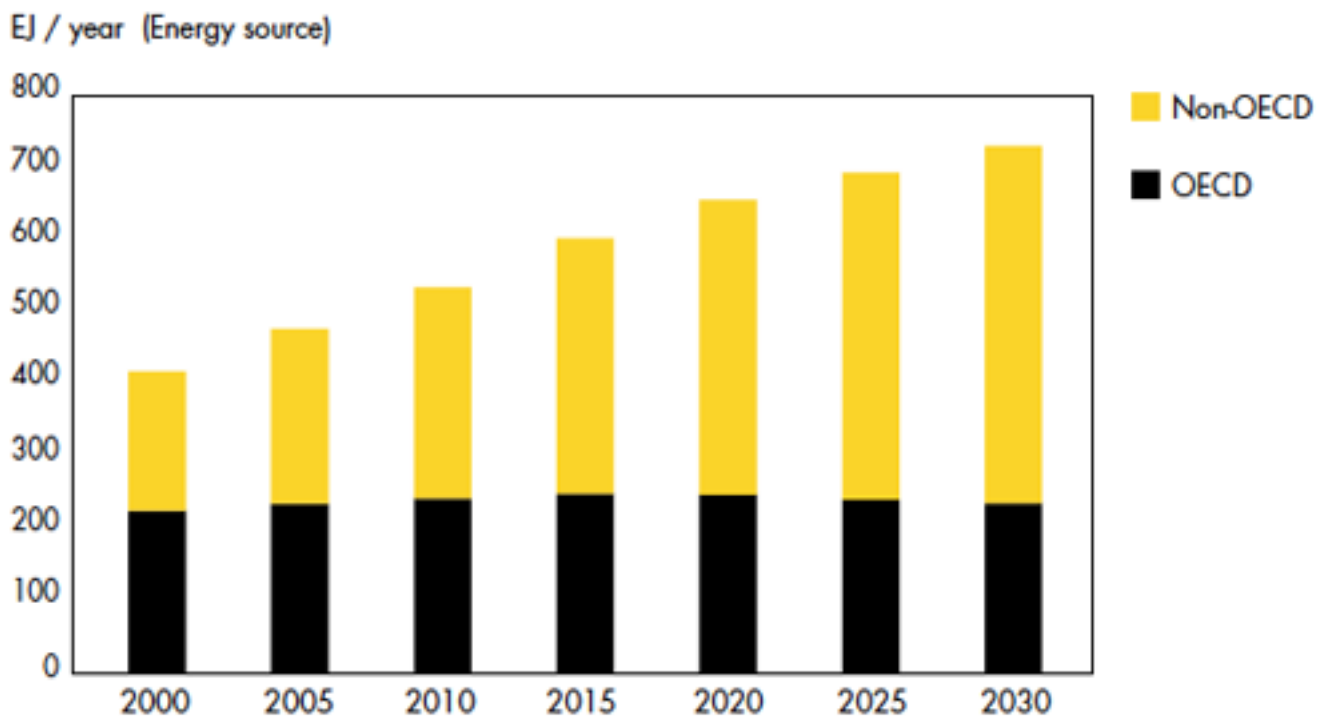
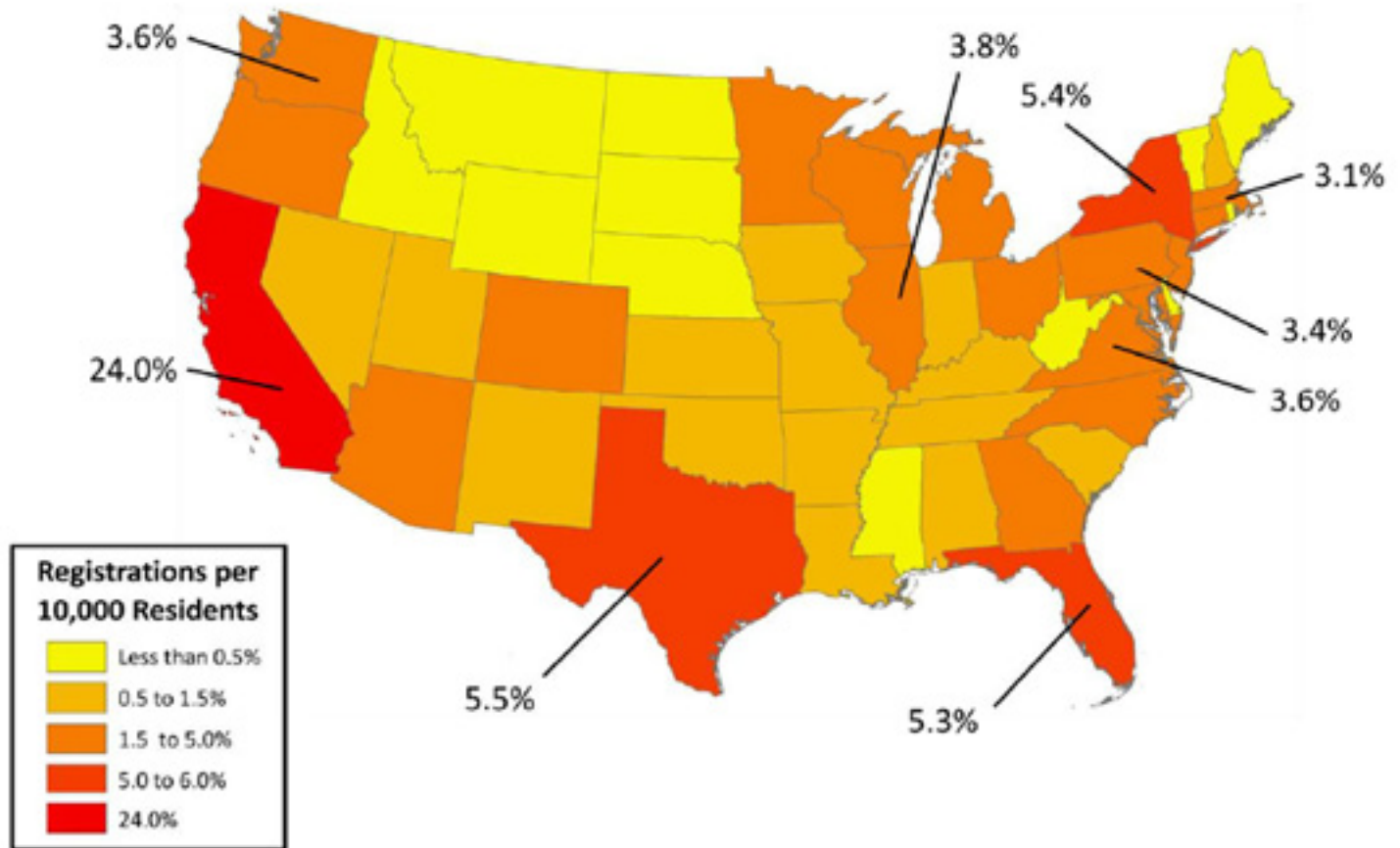


Figure 3: U.S. Retail Hybrid Registrations: 2007-2009 (Percent of Total Hybrid Fleet)



Source: Polk

Where the EVs Will Be... Maybe

If you're an "early adopter," an EVangelist, an electric utility, or just damned curious about electric cars, then you'll be interested in where the Center for Automotive Research, the Ann Arbor, Michigan one, thinks they will be located. They created a chart (reproduced in the mobile version of Insider) that gives a state-by-state forecast of vehicle deployments between 2012 and 2015.

Perhaps their key finding (guessimate?) is that there will be less than 500,000 e-drive vehicles on U.S. roads, half the number the Obama Administration is aiming for. States the CAR Group press release, "that estimate puts a total of 496,000 plug-in electric vehicles on

US roads in 2015, with annual sales of 27,000 for 2011; 77,000 for 2012; 116,000 for 2013; 136,000 for 2014; and 140,000 for 2015."

They note, "the study is not a forecast of sales of electric vehicles; rather, it estimates electric vehicle deployment by state, using other forecasts of total electric vehicle sales in the US..." As might be expected, California will see the largest number, more than four times the number of the two next largest states, Texas and New York, with total aggregated fleet numbers of 112,000 by 2015.

Chart at right shows total EVs by state.

State	Electric Vehicles Sold Per Year				Aggregated Electric Vehicles on Road*			
	2012	2013	2014	2015	2012	2013	2014	2015
AK	145	218	256	264	145	363	619	883
AL	547	825	967	995	547	1,372	2,339	3,334
AR	459	692	812	835	459	1,152	1,963	2,799
AZ	2,043	3,077	3,608	3,714	2,043	5,120	8,728	12,442
CA	18,442	27,783	32,573	33,531	18,442	46,224	78,797	112,328
CO	1,623	2,445	2,867	2,951	1,623	4,068	6,935	9,886
CT	1,338	2,015	2,362	2,432	1,338	3,353	5,715	8,147
DC	240	361	423	435	240	600	1,023	1,459
DE	228	343	403	415	228	571	974	1,389
FL	4,073	6,137	7,195	7,406	4,073	10,210	17,404	24,811
GA	1,335	2,011	2,358	2,427	1,335	3,346	5,704	8,131
HI	362	545	640	658	362	908	1,547	2,205
IA	646	973	1,141	1,175	646	1,620	2,761	3,936
ID	309	466	546	562	309	775	1,321	1,882
IL	2,935	4,422	5,184	5,337	2,935	7,357	12,542	17,878
IN	1,094	1,648	1,932	1,988	1,094	2,741	4,673	6,661
KS	570	859	1,007	1,036	570	1,428	2,435	3,471
KY	519	781	916	943	519	1,300	2,215	3,158
LA	429	646	758	780	429	1,076	1,834	2,614
MA	2,375	3,579	4,196	4,319	2,375	5,954	10,150	14,469
MD	1,918	2,890	3,388	3,488	1,918	4,808	8,196	11,683
ME	378	569	667	687	378	947	1,614	2,300
MI	1,384	2,084	2,444	2,515	1,384	3,468	5,911	8,427
MN	1,221	1,840	2,157	2,221	1,221	3,061	5,218	7,439
MO	993	1,495	1,753	1,805	993	2,488	4,241	6,046
MS	221	333	391	402	221	555	945	1,348
MT	219	329	386	398	219	548	934	1,332
NC	1,939	2,921	3,425	3,525	1,939	4,860	8,284	11,810
ND	87	131	154	158	87	218	372	531
NE	287	433	508	523	287	720	1,228	1,750
NH	502	756	887	913	502	1,258	2,145	3,058
NJ	2,152	3,242	3,801	3,913	2,152	5,394	9,194	13,107
NM	559	842	988	1,017	559	1,402	2,389	3,406
NV	627	945	1,108	1,140	627	1,572	2,679	3,819
NY	4,136	6,231	7,306	7,520	4,136	10,368	17,673	25,194
OH	1,893	2,852	3,344	3,442	1,893	4,746	8,090	11,532
OK	493	743	871	896	493	1,236	2,106	3,003
OR	1,605	2,418	2,835	2,918	1,605	4,023	6,858	9,776
PA	2,608	3,929	4,607	4,742	2,608	6,537	11,144	15,886
RI	294	443	520	535	294	738	1,257	1,793
SC	680	1,024	1,201	1,236	680	1,704	2,904	4,140
SD	136	205	240	247	136	340	580	827
TN	817	1,231	1,443	1,485	817	2,047	3,490	4,975
TX	4,227	6,368	7,466	7,685	4,227	10,595	18,061	25,746
UT	494	745	873	899	494	1,239	2,112	3,010
VA	2,803	4,223	4,952	5,097	2,803	7,027	11,978	17,076
VT	276	416	488	502	276	692	1,180	1,682
WA	2,737	4,123	4,834	4,976	2,737	6,860	11,694	16,671
WI	1,256	1,892	2,218	2,283	1,256	3,148	5,366	7,649
WV	238	359	421	433	238	597	1,018	1,451
WY	107	161	188	194	107	267	456	650
Total	77,000	116,000	136,000	140,000	77,000	193,000	329,000	469,000

*Does not include electric vehicles sold before 2012.

Source: CAR Research



First We Clean Up the Cars, Then the Grid

Perhaps the most oft-heard criticism about electric cars, after battery costs and range anxiety, is the fact that they are powered by coal. And while that is not entirely true, certainly a significant amount of electric energy used to charge them does come from coal and natural gas-fired thermal electric plants. One such group, the Pacific Research Institute -- yet another free markets think tank -- recently wrote "in only 12 states is more than 40 percent of the total electricity generated from low-carbon sources." [See the maps from their report reproduced on the Insider Mobile].

PRI recommends, among other things that "government investment needs to spur technological development, not simply entrench and institutionalize first-generation

efforts." By that they mean plug-in electric vehicles, though they also raise the issue of biofuels and essentially conclude that we need more research and innovation, without specifically identifying what that is or when we might expect it to be commercialized.

This reminds me of something my friend in Mexico City once told me when someone raised the argument about coal-powered electric cars. He replied that he'd cleaned up his car, what were they doing to clean up their utilities?

Carmakers have found a first generation solution that largely removes the automobile from the environmental equation: electric

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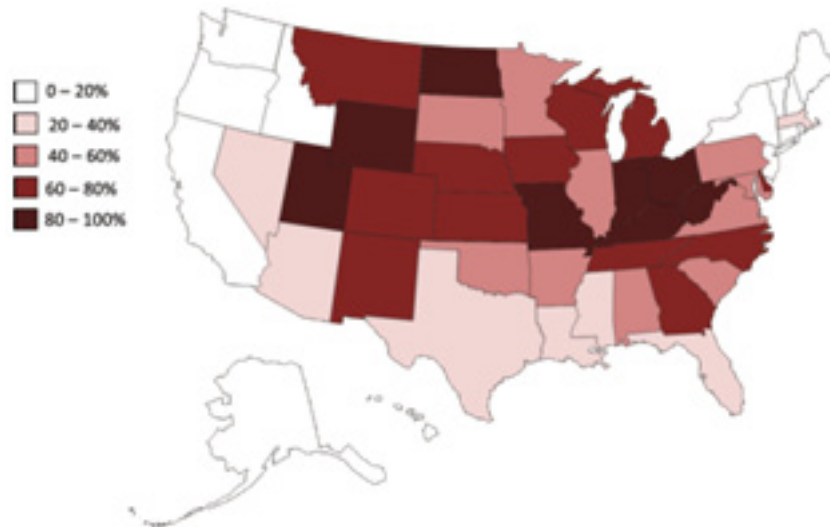
Grid continued...

vehicles. The car itself does not pollute, period. Yes, more than any of us want, coal, oil, and natural gas represent too large a portion of the generation mix, but that's not the car industry's fault, or the people that buy electric cars. That's a problem the utility industry needs to resolve, and fortified with a new Harvard Medical School study [<http://www.greenpeace.org/usa/en/media-center/news-releases/Harvard-Coal-impacts-cost-public-up-to-a-half-trillion-dollars-annually/>] that calculates the

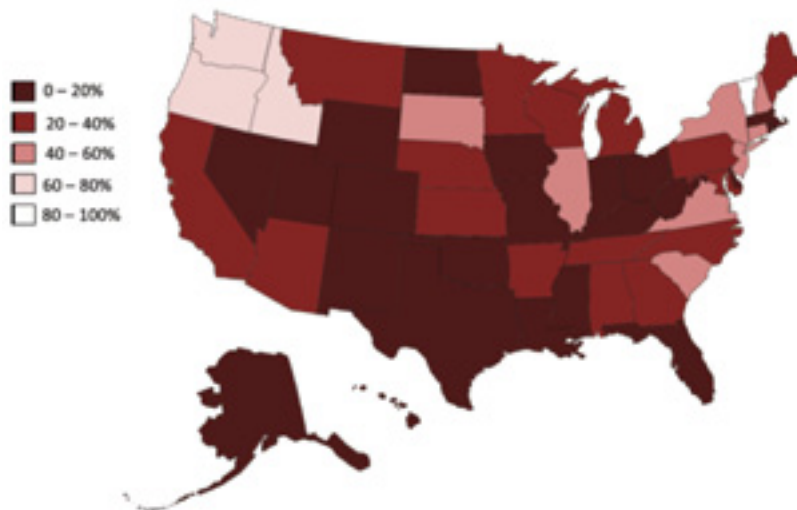
environmental, economic and health costs of burning coal at half a trillion dollars annually, Greenpeace has taken on the challenge, starting with efforts to close down an aging coal-fired power plant.

If concerned citizens band together like the common people did in Egypt... or Madison, Wisconsin... power companies may find themselves being pressured into seriously cleaning up their share of the grid. We've won over the car industry, now it's up to the utilities to get off coal.

Maps below from PRI report.



ABOVE: Percentag of electric power generated from fossil fuel sources by state. BELOW: Percentage of electric power generated from non-fossil fuel sources including hydropower, nuclear, wind and solar.





Chevrolet Volt 'cockpit', which Felix Kramer reports feels like "21st century space capsule."

Kramer vs. Kramer

If you've been a citizen of the EV world for any length of time, you'll likely have heard of Felix Kramer, one of the driving forces behind the plug-in hybrid movement. He formed the California Cars Initiative (Calcars.org) back in 2004 with the express intent to getting automakers interested in building not just battery electric cars, but electric hybrids.

Now he's gotten both of his wishes. He and his wife Rochelle are now the proud own-

ers of both a Nissan LEAF and Chevy Volt, pretty much guaranteeing their place in history as the first couple on the planet to do so. Living in the temperate climes of the San Francisco Bay area, they've been able to compare both cars, pretty much side-by-side, sharing the results with people via his web site and regular email postings. We thought EV World readers would find him comments instructive, so we've reprinted some key excerpts on the next page.



Each car is like a 21st century space capsule, gliding silently through streets clogged with last-century vehicles. I was never so aware of the unique and ugly sounds from each gas-guzzler. At stoplights, I even feel their low-frequency vibrations.

The Leaf is reassuringly predictable: with 80–100 miles of juice, most of the time, we don't think about range; we just drive around and charge it at night. With 163 miles in four days, it may become our first-to-use car, with the Volt reserved for times we both drive and for distances.

Each car offers subtle clues about its fundamental character. The Volt puts a whole car between the front left electric door and the rear right gasoline door. Inside, the button to flip open the electric door stands out while I have to work to reach the gas-door release, giving the message, "You're not going to be using this very often." The Leaf's charging ports are under a giant door right in the center of the car's nose: "There's nothing going on in here but electricity."

Both cars have slipped up some on what's called "computer-human interface." We wish they'd listened to suggestions to put prototypes in the hands of Silicon Valley's usability experts last summer. For instance, the charging signals -- plug in the Volt and the indicator turns yellow (connected), then steady green (charging). Finally it flashes green (done). That's exactly the reverse of a user's expectations. The Leaf, with a longer charge time, starts out well, with three indicators that illuminate in succession as the car reaches its charge. But 15 minutes after it's full, all the blue lights go off

We've reached a sweet moment. Since 2005, CalCars has been trumpeting that plug-in hybrids (and extended range electric vehicles) get 100+ MPG of gasoline (plus a penny a mile of electricity). GM didn't squawk when the Volt sticker said its MPG when using gasoline and electricity would range from 69–168 MPG for 30–75 mile trips. Now our real-world Volt experience confirms both our experience with conversions and our predictions for production vehicles. Many of our Bay Area trips in the Volt have exceeded the car's typical 35–40 mile all-electric range -- and we've used our portable charging connector at a destination only once. When we subtract out the two long trips, our local 1,346.9 miles on 11.8 gallons were at 114.1 MPG.



Jim Billmaier (left), Congressman Jay Inslee (center), Plug-In America President Dan Davids (right)

Jolt-ing Four EV Fallacies

In the introduction to his new book, “Jolt! The Impending Dominance of the Electric Car and Why America Must Take Charge,” Jim Billmaier explains why he decided to write the book. It all stemmed out of a conversation over a couple bottles of wine about how he and his fellow Silicon Valley colleagues could help solve America’s most daunting challenge: energy independence. That conversation launched a two year-long journey of discovery in which he says he studied all aspects of next-generation electric vehicles, and what they mean economically to the nation, and the world. The result of that research can be found in his book.

And as with all good books, someone decided to interview him and pose some challenging questions. That someone was Heather Clancy [<http://evworld.com/news.cfm?newsid=25226>] who raised the following four issues. I loved Billmaier’s responses and thought you’d enjoy them as well.



- **We're shifting the problem from oil dependence to coal dependence.**

Without disputing the fact of the matter, Billmaier notes that the processing of oil into gasoline uses 6 to 7 kilowatt hours of energy per gallon. Put slightly differently, he argues that a gas-powered car covers just 8 miles for every \$1 put into it. That same amount of money would provide enough charge to take a car 50 miles. Another consideration: If every American drove an electric car, the emissions would still be about two-thirds less, even factoring in the negatives of coal production. So, the lesser of two evils.

- **We shouldn't subsidize their adoption.**

Billmaier estimates that there are still \$12,000 in subsidies related to every gas-powered car sold. "I believe in capitalism, but in order for capitalism to work, you have to have a level playing field. You don't have a level playing field right now," he says.

- **Electric vehicles are underpowered.**

Billmaier points out that electricity does darn well moving very big vehicles already, and that battery technologies have reached the point where electric will be appropriate for the larger vehicles many Americans prefer.

- **The charging infrastructure needs to be in place first.**

Billmaier actually says that from a driving standpoint, the United States can be divided into six regions where electric vehicles will catch on first. Electric vehicles are great regional cars, he argues. And while many people worry about the long time that it takes to charge vehicle, he notes that driving habits will actually make it easier to keep electric vehicles charged. That's because you CAN essentially top off a charge, just like you would with a gas-powered vehicle.