

Felix Kramer at Green Drive Expo, Richmond, CA, September 17, 2011.

It's keyed to the presentation that's downloadable as a PDF at <http://www.calcars.org/downloads> , the audio recording the streams at the same URL, and to the CalCars-News report found at <http://www.calcars.org/calcars-news/1143.html> . Thanks to Bill Mac Iver and Michael Bender for the transcript.

[GATHERING CROWD] For years we were saying that's we're going to someday have these cars -- and now we're getting them. And it's an extraordinary moment. So we're here to celebrate that. And we're here to celebrate all those cars, these dozens of cars here. Last year, we had a few converted cars. And we had a few left-over cars, the valiant RAV4 EVs, and the Ranger S10s. We had the cars that managed to stay alive all these years. Now we've actually got production plug-in hybrid vehicles. Isn't that amazing?
[APPLAUSE] Yes, that's really an extraordinary thing.

And for all the grief we've given the carmakers, they've stepped up and they've made the cars, isn't that right? Yeah, let's do it. Okay? [APPLAUSE]

Okay, it looks like we're getting a little critical mass here, so I'm ready to start. Now, there's a really tiny screen here, but don't worry. If you go to the Calcars.org website, you can see the whole thing. And there's a lot of information on that screen, but you don't have to write any of it down because it's all on the website.

So, what I want to do now is I want to tell a story. It's a story called "How I Spent My Last Ten Years". And it's the best years of my life, by far! I can't tell you how satisfied I am about what I've been doing, and what's happened. It's an amazing time.

So, I want to tell that story. I want to explain a little about plug-in cars for you people who don't know. I assume everybody here knows what a plug-in car is --= but how to explain it to other people? That's an important thing, because everyone here is an evangelist for these cars. I want to talk about the choices we have now and the ones that are coming. I want to talk about how you can act now, and who you can do it with -- the organizations you can do it with. And I want to give you information so you can answer your questions, and everybody else's questions. And finally, I want to talk about CalCars' next projects, what we're trying to do in the future after declaring victory on this first phase of the project.

SLIDE 1: So, in that tiny screen there you can see my Chevy Volt and Nissan Leaf parked in front of my house in Redwood City. We've been driving them since December on the Volt, and since January on the Leaf, and sometime at the end of this year, we're moving the whole kit and kaboodle over to Berkeley -- relocating. And what I did was -- and this is an important message -- I basically said: We have to drive everywhere. We want to have two good cars to drive everywhere. But we don't want to have to drive everywhere! We want to be able to walk places; we want to be able to take mass transit, walk, bike, run, bus, whatever it is.

You probably heard about the idea of a "negawatt?" The best, the cheapest unit of electricity is a negawatt, a watt saved? Same thing applies to a "negamile." You know, I love plug-in cars, but a mile not-driven is way better than ANY plug-in car. So, I did a compass around every BART station, and we're going to live five blocks from a BART station, and I hope we'll go down to one car! And, you know, conceivably, someday down to no cars, and just use a Zipcar and other kinds of things.

And, you know, for everyone living in the Bay Area, I'm a big fan of plug-in hybrids, but I'm also a huge fan of plug-in electrical vehicles. You should know that every family that has two vehicles, that second vehicle --- it's absolutely a no-brainer to have an all-electric vehicle.

And if you want to have a little courage, your single vehicle can be an all-electric vehicle. I know dozens of people for whom that's true. So, what do they do? Most of their driving is just around the

neighborhood, or around fifty miles, whatever. It's all-electric. If they want to go further, they've got three choices: They've got Zipcar, which is everywhere; they've got Enterprise and Hertz and the other places that you can rent a car; or they just say to their neighbor, "Hey ? I'm going up to Tahoe for the weekend. Would you mind driving my snazzy all-electric vehicle for the weekend and giving me your gas-guzzler?" And people will jump at the chance! They'll say "Please. Can I be the first one, next time you're going away, to switch cars with you?" So, you don't have to own a gas-guzzler anymore, and that's an amazing thing. That's an amazing accomplishment.

SLIDE 2: So, here we go. We talk about plug-in cars, and it's kind of a complicated message. But we've boiled it down to a meme -- a catchy phrase that puts it all into three words: Compared to gasoline, electricity is "Cheaper, Cleaner, and Domestic." And that's all it is. Cheaper: Your mile is two to four cents a mile compared to eight to 50 cents a mile; obviously it depends on your price of oil, price of electricity. And that economics on cheaper also carries into the economics of the auto industry. Because everybody in the auto industry now says the future of this industry is electrification. So, plug-in vehicles, batteries, all a part of the supply chain -- that's how the auto industry is going to move forward. So, that's cheaper.

Cleaner: Cars have gotten pretty clean in terms of conventional emissions, but obviously, the main issue is CO2 and greenhouse gases. On the national grid, which is half coal, an electric mile is half as much CO2 as a gasoline mile. And it gets only better than that. In California we're 20% coal, so you can see how much better. My favorite thing that people say about plug-in cars is that "they're the only vehicles that get cleaner as they get older. Because the grid is getting cleaner. "

And for me, my entire motivation for this thing has been about climate change and energy security. Nothing else really counts anyway, and I believe we're in a really dire situation. We are in huge danger. I'll show you -- I have a couple of tee shirts, I'll show you one of them. This one I first saw on Marc Geller, who I saw a minute ago. This is a t-shirt called "Petrocide". This is what we've been doing to ourselves. And, you know, we can't keep doing it.

And if you think about climate change, it's really easy to fix climate change. We need to fix our construction industry and our buildings, and we can retrofit them. It's easy -- conceptually -- right? We need to fix agriculture; there are ways to make it zero-carbon agriculture. And we need to fix anything that moves -- every device, mostly transportation, but not only. And we can take every single device in the world, and power it electrically, and at the same time we clean the grid: We're done! Now, that's something we can do, you know? We can do it with the transmission lines, and the wind power, and the solar power, and so forth. And if we plug in everything in the world, we're done! And that's what the message of plug-in cars really is, fundamentally [APPLAUSE]

Yeah, even louder, because maybe some more people will come over. Yeah! [APPLAUSE] We can do this!

SLIDE 3: So, how do we explain plug-in cars? A plug-in hybrid, to start with. A hybrid just uses some electricity. When you go up a hill, you use gasoline; on the way down you recapture it into a battery and use it to start up again. That's a hybrid. You can double your miles per gallon from 25 to 50. But it's all gasoline -- you can't get away from that. So, if you add a large battery, and you can plug it in, now you've got two alternative sources of propulsion. And so, conceptually, we struggled and struggled with this for a long time. "It's like your car has two fuel tanks, and you use the electric one first." That's all.

There's variants on it; there's technical designs for the series hybrid, the parallel hybrid, the Chevy Volt, and other vehicles, but they all work that way, in one way or another. And that electric vehicle? It's the plug-in hybrid, minus all that gasoline stuff -- the tank, and everything else. And when you're left with just an electric vehicle, you're there. And if you want to go in for service on an electrical vehicle, you go in for every 7,500 miles, and you rotate the tires, and you're done.

So, that's the idea. And last year, we could talk theoretically about these cars. We could say, you know, these cars are coming someday. But now they're all here. And you can see those plug-in hybrids, and you can see those all-electric vehicles right now. Here they are.

SLIDE 4: So, there's a lot of really cool pictures from the last ten years. I'm going to describe them. On the upper-left, you've got CalCars. We're a non-profit organization. We uniquely combine technology demonstrations and advocacy to get this message across. We founded it in 2002, and in 2004 we did the first Prius conversion across the Bay here in Marin in Ron Gremban's garage. He spoke here last year; that's him in the left of that group. We took a Prius -- and we fixed it. And now, seven years later, Toyota is finally coming around with a car that's BETTER than the one we built. Obviously! We did it in a garage. You know, it's not too hard to do better than that -- but they did a lot better. And you can see Marc Geller in that picture, too; he was one of the stalwarts.

Next to it, when I got my Prius, a white Prius that you may have seen me driving around the Bay a lot with green signs of 100+ miles on it -- one of the first things we did is we flew that car to Washington. And it was joined by another car that we were involved in converting that came down from Connecticut. We parked it in front of Congress, and we brought congressmen, representatives, senators out to see it and talk about it, and they went back in and said, "Why can't we have these cars? We saw some engineers out there who did these things."

[HOLDS DONGLE] One of our most powerful messages was that every alternative-fuel vehicle needs new technology, new infrastructure. This connects us to today's infrastructure. This is the little dongle -- that's engineering talk in Silicon Valley -- for connecting a vehicle, for any device. We took these and the members of Congress passed them around and talked into it as though it were a sacred object or microphone. So, we handed these things out. And I've got them here for Eric [Powers] and for Brad [Berman], who've done such a great job in putting this thing together. I've got some of these souvenirs.

So, we had those then. Now, you've got the new version of that thing. It's got a long name: EVSE -- Electric Vehicle Supply Equipment. It's not a charger, because the charger is in the car. Here's the Volt; here's the Leaf. This one here reflects the energy of some of the people in the electric vehicle community. It's done by a company that's got a booth in the back called EVSEUUPGRADE. What they've done is they took the standard EVSE that Nissan gives with the vehicle and they fixed that. They made it so that it works on 240 volts and can bring more power to you. You can plug this thing into a dryer outlet -- or you can just plug it into a 120. And you can buy them right back there; it's amazing.

When we did our conversions, we made these t-shirts. They say "I get 100+ miles per gallon". And we wore them with the CalCars logo, and we started selling t-shirts that said "I want 100+ miles per gallon." And so now a lot of people can actually get 100+ miles per gallon.

So, we brought the cars to Washington. We also brought them to Crissy Field -- right near the Golden Gate Bridge -- and we joined an organization called Step It Up, which was the predecessor of 350.org, which was the predecessor or the sponsor of the TarSandsAction.org you read about the past couple of weeks. And everybody got the message that plug-in cars are essential to this movement for doing something about climate change.

And next week, on the 24th, you've got the Moving Planet event. It's another event about climate change and what we can do about it. There are feeder events coming from all over the Bay Area, but there's going to be a parade down in San Francisco -- there's going to be at least 10 plug-in vehicles that are going to be a part of that parade, and we'll be there. My Nissan Leaf has a conversation-starter license plate: It's COAL BAD. And I get a lot of comments from that. I wouldn't take that car to Kentucky or West Virginia [LAUGHTER], but around here, people want to understand why driving a car on the grid is a good idea. Coal is bad, but coal and cars is a lot better than gasoline and cars. So, that's that message.

The other pictures there -- we got President Bush to look at a Hymotion conversion in 2007, and President -- no, even before, candidate -- Obama came to Google and looked at one of their conversions in '07. The

two Google guys got really involved in this whole thing. In 2008, one of my favorite moments was when the chief engineer of the recently-announced Chevy Volt came to Pat's Garage in California -- Pat and Nick talked here before -- and met with a group of about 15 electric vehicle and plug-in hybrid drivers to get our information, our ideas, about what ought to be in the car. And that was just a great moment! There on the lower right was my car [Volt] right after I got it -- driving in the Bay Area.

SLIDE 5: There's a lot of images. Those are books. So, one day, Congressman Jay Inslee was on the phone calling me ? I work at home ? he called and he said, "Hi, I'm Jay Inslee". I'd heard of him. And you probably all have, too; he's running for governor in the State of Washington. One of the best people in Congress. He said, "I'm writing a book on hybrids. I'd like to tell your story". And so, he did. And about 20 or 30 other books came out over that time. One of them, the first one on the left there, is called "Plug-In Hybrids: The Cars That Will Recharge America," written by Sherry Boschert, who is a longtime plug-in person in the Bay Area. That book is on sale in the back in the Plug In America booth. That tells the early story of these vehicles. And so, we just got a tremendous amount of validation from these people writing in these books.

SLIDE 6: And then we had a media onslaught. We had more media than you could imagine, and I'll just read two of them [quotes]. One of them was my favorite. "Possibly the most sought-out technological innovation since Captain Kirk first flipped open his communicator is the plug-in hybrid". And that was from a major reporter from the New York Times. There are a lot of other kudos like that.

And then the first one on the page is from America's leading climate scientist, James Hanson. He was arrested at the Tar Sands Action place [White House civil disobedience]. He said that if that project goes through, it's curtains. We will get all that oil traveling through to the south coast and exported all over the world, all that dirty oil -- really dirty oil. He says "The plug-in hybrid approach, as being pursued by CalCars, seems to be our best bet for controlling vehicle CO2 emissions in the near term". And he really understood it. Of course, I agree with that; I also believe that plug-in hybrids are a transitional platform, and that the sooner we get to all-electric vehicles, the better. If I turn out to be wrong that plug-in hybrids become the dominant vehicle, I win. We all win. So we had a lot of great times, and on our website there's a lot of great quotes from that media avalanche.

SLIDE 7: Another chock-full slide. We began chronicling what the auto industry was saying about plug-in hybrids since around 2005. And you can read all their quotes as they went back and forth and said contradictory things. And we had a lot of fun sending journalists to that place, and basically catching them on the contradictions of what they said; and eventually, we basically started promulgating the idea that there was a race going on for what carmaker was going to be first, and which carmaker was going to come to market first. A lot of carmakers jumped into that race. And at this point, every carmaker has something coming -- either a plug-in electric vehicle, or a plug-in hybrid -- or already on the market.

If you want to track them, there's trackers at PlugInAmerica.org, and there's a tracker at PlugInCars.com, which is the Brad Berman site. There's also one at Wikipedia. You won't remember this, but you can look on the slide. You have to search for "List of modern production plug-in electric vehicles" and you'll get a rundown. Unfortunately, all three of these trackers are NO up to date, and in some cases, not fully accurate, especially on price and on delivery schedules. Because nobody's got the resources among those three places to fix them. If any one of you wants some volunteer project, you want to scan the media and go and help Plug In America, or PlugInCars, update them, or contribute your own information to that Wikipedia site, that's something you can do right now.

So, that race is really in earnest, all those cars are coming. The story of this campaign -- the first part of the story, actually -- was really well-told in "Who Killed the Electric Car?" which most of you probably have seen. The sequel, "The Revenge of the Electric Car" is coming . It's going to open nationally on November 1st. If you want to see a preview of it, go to the Palo Alto Film Festival website, and you can go to a preview on October 1st and see it a month before everybody else.

SLIDE 8: Now, the headline of this slide says "Victory! How often do our dreams come true?" So, this is the story of what happened on December 22nd of last year, when I, and my technology partner Ron Gremban from Corte Madera, and Andy Frank, from Davis -- he's the father of the modern plug-in hybrid -- all came to Novato Chevrolet. Andy had picked up his Volt the day before up in Sacramento. But we got our Chevy Volts on December 22nd. And there's a great picture there on the upper-left. That picture has, on the left there, Marc Geller from Plug In America; next to him is Dave Barthmuss, who if you saw "Who Killed the Electric Car?" was the person forced to talk on behalf of GM and say a lot of misrepresentations of all sorts. And he's a good guy! And he's really happy to drive his plug-in car. He was there. And then you have Nick Rothman and Pat Cadam from GreenGarage back there [at the Expo], and me, and the three of us. So, this was the culmination of our dreams.

And on the right, there, you've got a picture -- for a little while, I had a three-car fleet; I got the Leaf in January, we had the old converted Prius, and the Volt and the Leaf, and we had to get rid of one of them[the Prius], so we sold it to a plug-in advocate in San Francisco. So, we now have those two cars.

SLIDE 9: So, it's been now nine months since the three of us have had those cars. There's a better picture of us at my Volt in the back there [at the Expo], a big one there. You can see it, some of this information. So, here's how we've done in nine months. For years we said "100+ miles per gallon vehicles." And that's got an asterisk: It's 100+ miles of gasoline, plus electricity, about two cents a mile. But people said, these cars, "these hybrids aren't going to get 100+ miles a gallon." It obviously depends on how you drive. So, for Ron, he's driven 4,729 miles in the last nine months, and got 151 miles a gallon. It's right on his display; there's no question about it. Mostly in the Bay Area. Andy Frank has driven 8,900 miles between Dixon, where his new company, Efficient Drivetrains, Inc. is, and Davis and Sacramento, and with his 8,900 miles, he's 107 miles a gallon. That's pretty good!

For me, I'm ashamed. Okay, I've driven 4,300 miles locally on the Leaf because my wife and I will drive the Leaf FIRST every day. Because it's all electric; it's got that great range. So just drive that all the time, unless we need five passengers rather than four, or we're going a longer distance. But I've also taken that car to Tahoe ten times since December. Round trip up to Tahoe. And dozens of trips beyond the 80 or so easy miles on the Leaf over to Berkeley or other places, back and forth.

So I've got 11,269 miles, and my miles per gallon is 62 miles a gallon -- a lot lower. But that's because only 3,000 or 4,000 of those miles have been electric. But when I get up to Tahoe, I drive all electric in Tahoe. And so, you know, it's a good system. And when we're in Berkeley we'll have less local driving, so we're going to be better.

And so I just want to mention about those trip to Tahoe, the first time I actually figured it out. Our Chevy Volt in the back there was the first vehicle to be able to drive from the Bay Area to Tahoe without recharging -- without refueling, gasoline or electric. A Tesla has a 240-mile range, but you can't go 225 miles, plus 8,000 feet up -- and get there. And there's no charging infrastructure yet along the way. So, my Volt got there and made history that way. And so we had a full battery each way, and so, on the way up, it was 35.8 miles per gallon; the first miles were electric, and the rest was gasoline. On the way down, we coasted all the way to Colfax, basically, coasted and went on electric. So, on the way down, 50.8 miles round trip.

And you should know that the Chevy Volt, first car, the miles per gallon after the battery's depleted is only in the mid-30s, and it's not great; it's not good compared to the [Prius]. But that's because they concentrated on getting that car to market at the right time when they said they would, and they threw in an Austrian engine that was not optimized. The next generation of Volts will be a lot better.

So, that's the story, and these cars, as I've explained, are wonderful cars. On usability, they could use a lot of help, and that's an issue that CalCars has talked about. They could use a lot of help on their displays and all sorts of things.

SLIDE 10: So, this lists the cars that are available now, I won't go through that right now, you know, what you can get? I mean, well, I will. Okay. The Leaf: 35,000 bucks; the Smart ED: \$600 a month; Mitsubishi is coming out, \$29,000; the Tesla Roadster, the successor, the S next year, will be around \$60,000 -- five passengers plus two kids; the Ford Focus, Honda Fit, Toyota RAV 4, Min, Coda, a lot of others coming next year, all eligible for \$7,500 tax credit, and all eligible for the carpool lane.

Plug-in hybrids: the Chevy Volt, in the forties, not eligible for the carpool lane, not eligible for a state tax credit, but eligible for the full \$7,500 federal; the Fisker Karma is out, and its successor, the Nina -- expensive sports cars; the plug-in Prius, \$32,000, gets a \$2,500 credit, because it's got a smaller battery, no state credit [correction: \$1,500 credit]. So, that's what's happening with all the cars.

SLIDE 11: The next slide is the most important one, but you can't see it, so I'll tell you -- you can look on the website. Success is not guaranteed. So, we need to buy, and plug, two things: ideas, and cars. So, that's what we need to do. We need to educate ourselves.

So, here's the list of the organizations that are the key groups that are doing something: Plug In America, Electric Auto, with chapters all over the Bay Area; ElectricDrive.org, that's the trade association of the industry; the Sierra Club has gone big into plug-in cars, now; ProjectGetReady.org is the Rocky Mountain Institute, Amory Lovins' spinoff, that's about readiness in communities; and all your local utilities. They can help, too. That's the people you should be working with.

And then you need to get informed, and communicate with others. Again, there's about four or five main sites: There's EVWorld.com; PlugInCars.com, a sponsor here; AutoBlogGreen, Sebastian is here somewhere, a great reporter; Green Car Congress; and AutoObserver.com from Edmonds. Those are all great sites where you can inform yourself. And then for users, there's GMVolt.com, where people who have the Volt post; and there's MyNissanLeaf.net, where people who have a Leaf post, and there will be more. For the big picture, ClimateProgress.org, and Grist and Treehugger situate plug-in vehicles in the larger picture on climate change. So, I recommend you go to all those places.

So, that's pretty much it. Now, I want to say that Plug-In Day, nationally, is October 16th, on a Sunday, and there are going to be events around here; check at Plug-In America to find out what they are. CalCars declared victory in '09 when we knew the cars were coming, but we declared victory on Phase One -- there's a lot to do, and the success of these vehicles is not assured.

So, if I have time, I'll talk for five or ten minutes more about our new projects. We've got a number of things we're trying to do. First is, if there's an entrepreneur around who wants to hit ground running with a new company, we want you to help you start "Drivers2Drivers" to collect all the information about these cars, and sell it to the auto industry in a way that's never been done before, in partnership with all the media outlets that are out there, and all the other people. We think there's a business there, like the J.D. Power equivalent for grass-roots and online.

We're trying to get a 4-wheel drive vehicle to come to America soon, because when I go to Tahoe everybody says, "I want a plug-in vehicle, but I won't buy one until it [has 4-wheel drive]." So, candidates are Mitsubishi, Subaru, and a couple others, but nobody gets it; and we can offer them an instant market of hundreds of thousands of people. Anybody wants to work on that, they can talk to me.

A local project: I've rewired the house we're building[remodeling], so the car can be a back-up system in the case of an outage. You don't spend \$5,000 on a diesel back-up system. And we've got rooftop solar. So, we can keep going for days.

And I'm trying to get the City of Berkeley to okay the other piece of it: our having the first free, on-street charging facility for people who come to North Berkeley and want to shop for a couple of hours -- on the right-of-way, NOT reserving a space just saying, "If you're here and you can park, don't park here, park in many open spaces on our block, but if you want to charge, you can charge here for free." I'm testifying at the Berkeley City Council on Tuesday night. Anybody who wants to join me, or talk to me about it, or

send an email saying this is something we believe in, you know, you can contact me. Those are small projects.

SLIDE 12: The biggest project is a bigger leap in concept. It's called "The Big Fix." We need to get off oil, and in order to do so, the new plug-in cars aren't enough. A million cars by 2015 is great, a few million after that -- but we've got 250 million cars in the U.S., a billion in the world -- I used to say 900 million. And so, if we're actually going to have an impact on petroleum in the next 15 years, which is when we need it for climate change and energy security, we have to fix millions of vehicles that are already on the road.

And we can do that. We can do it so that they're safe, warrantied, affordable, and we can do it in high volume. It's great that there are people who are converting cars like the Miata and others here, but this is a business. And we're working to help companies that are trying to get started develop that business model.

SLIDE 13: We have some good allies. That's a picture of me with Andy Frank, and the head of a company from Chicago, along with Andy Grove, the former Intel chair, at the 2008 Plug-In Conference, where we started talking about this idea. And he understands it; a lot of people understand it. In the movie "The Revenge of the Electric Car," you'll see Gadget, who's a Los Angeles converter. He's one of the four key figures in that film.

So, we need to convince people that there's a business case to do this, and a technology solution to do it. The technology solution is going to be EV in some cases, plug-in hybrid in others; it depends on the construction of the vehicle. You start with the big gas-guzzlers, the ones where there's plenty of room for big batteries, and you migrate down from there to the regular passenger vehicles. We think this is possible, but it's not going to happen automatically. And it needs to happen. So, all the victories we have with plug-in cars are not going to make a difference unless this can happen.

SLIDE 14: On our website we have a bunch of companies that are getting started here. Here's one: a bunch of ex-Tesla people stayed in Michigan when they brought the development center back, called ALTe [ALTe Propulsion Technologies]. And they're going to convert Ford F-150s, the most popular vehicle in America. Basically under \$25,000 dollars, turn it into a vehicle with a 30-40 mile electric range, onboard power, which is really important for people who are in construction, for people going fishing or hunting, you name it. And they need some help! But they applied for a federal loan [guarantee], but they haven't gotten it; they're trying to get private sources of financing. [PROMPT TO WRAP UP]Two more slides.

SLIDE 15:A lot of things that [need to] happen, the most important is that \$7,500 tax credit. Conversions ought to be eligible for that, just like they are, not for a ten percent credit up to \$40,000 or up to \$4,000 the way conversions are now. But there's a lot of this other stuff. And at some point, we need to get the oil industry to change what they're doing. And that's really hard, but they're going to stay around; they're not going anywhere. So we need to convert the oil industry to use hydrocarbons for plastics that'll sequester the CO₂; to drill now -- for geothermal; and to put their R&D in other places. So, that's the idea.

SLIDE 16: My question for you guys -- this is the CalCars website; you can subscribe to our news -- for me, I've found that the last ten years was truly the best thing I've ever done with my life.

If you have ANY time to spare, find something to do in cleantech, in the green world, in the automotive world, and do it as a volunteer, or full-time, start as a volunteer and work your way into a job. This is clearly happening. All the venture capitalists, even with the news about Solyndra, all the other people understand that this is the trillion-dollar opportunity. So, this is the opportunity for everybody in this room. So, I want to thank you for your attention. Bye [APPLAUSE].

BRAD BERMAN: As an entrepreneur, and as an activist, you've used those kinds of models to spur innovation, correct? FELIX: Yeah. BRAD: What role does legislation play? Isn't POLICY maybe the most effective tool to affect these changes?

FELIX: Well, of course legislation has been the most important. And the \$7,500 tax credit, and the automotive industry loan guarantees that are now starting to be criticized -- they were all Bush programs; he was in support of that. And Obama was an even bigger supporter, and made them happen. And one of the big reasons that happened is because there was this amazing coalition of people from every persuasion, every idea, who came together and said "let's get plug-in cars." So I believe that legislation is critical. Without the \$7,500 tax credit, we'd have a much more uphill battle. Without all the money for infrastructure and charging also.

But the reason that happened is because of events like this, because of conversions and demonstrations. We shamed the auto industry into doing this. And when the auto industry started saying to the government, you know, we want your help to get these cars on the road, that's when it happened.

AUDIENCE MEMBER: I have a question that's also about legislation. [INAUDIBLE] This is such a disparate effort.. Is there one kind of overarching organization ...

FELIX KRAMER: The question is, do we want an overarching organization? I wish there were, but unfortunately, there isn't. You know, Plug In America does a great job, and they have a real good legislative focus, and I would say that everyone here should join Plug In America, and get on their mailing list. If you're a member of the Sierra Club, you can do it through them, as well. The other organizations on my list, too.

There is nobody doing it [coordinating]; it's decentralized, and that's a problem. And it means that we don't have the clout with the auto industry. I would say they build great cars, but they are still carmakers, traditional carmakers. So, once they get the cars out there ...

You know, I took my Volt in for a software update last week. And nine months after that car came out -- and after the media had been writing about it forever -- they're still missing some really important things. Such as, if you don't want the radio on, and you turn it off, the next time you touch the display screen, the radio comes back on! And you don't have a state of charge indicator. And there's all sorts of little things, and they didn't fix it in the software update. Why? They had nine months to work on that. And there's all sorts of things. The new ones, the 2012 Volts that are coming out . have a state of charge indicator on the display. But they didn't put it in in software for us.

And so, we pleaded with them back last summer. We said, bring these cars to Silicon Valley before they're released. Because they're mostly software. And get all the experts around here in usability and interface and displays and everything to help you. And they didn't do it. So, there's a lot of arrogance still in the auto industry. "We know how to do it, and you know, people eat what we serve." But this group, working with the organizations, we can help to change that.

[AUDIENCE MEMBER]: [INAUDIBLE about Felix's Prius and resale value for PEVs]

FELIX KRAMER: Okay. So, the important thing to realize about plug-in cars is that their batteries -- everybody says, "Oh, it's going to affect their resale value." The batteries are warrantied for eight years and 100,000 miles to successive owners. So, eight years from now, that battery, which may cost \$5,000 to \$10,000 or more, you know, originally, eight years from now, that battery is going to cost a couple thousand dollars. Or, before you sell your car, you just go to Luscious Garage or Pat's Garage, whatever, and arrange with them to have you shipped a great battery from a crashed car, and you put it right in that car, you will not have a problem. You will have almost a new car at that point.

So, the resale value on these vehicles is going to hold up really well. Certainly the Prius has, and I sold my Prius, which had a Hymotion conversion in it for a good price, and it's still driving real well.

And you know, it's the same with solar when people talk about the payback for solar, they don't say, well, if you sell your house, are you going to get any value for that-- that's not counted. So, you know, the plug-in is discounted in the assured resale value.

And the other thing I would say is that these vehicles, like the Volt, it's using the engine a lot less. And so, it's service intervals are [longer], and just like the Prius, you're not going to have to replace the brakes; there's lots of other things that are getting a lot less wear and tear, so the car will last longer.

BRAD: What's your view on the pace of the rollout of electric cars and the EV infrastructure?

FELIX: Well, my feeling on the EV infrastructure is that most people are going to be plugging in at home, at night, the way they should. And the focus on the infrastructure has been overstated. It's nice that it's out there, and it's handy. It would be nice to have fast-charging to go on I-80, we're going to have it on I-5, all the way up and down pretty soon. But it's not a determining factor. The first buyers of these cars are self-selecting based on their driving habits. So, it's not a problem for anybody who has these cars.

As far as the rate of the roll-out, obviously, the tsunami took a real big hit on Toyota and Nissan, and slowed them a significant amount. And so, there's only 5,000 or a bit more Leafs out there, there's fewer than that on the Volt.

The Volt closed its factory, and as a result there were stories saying, "the Volt isn't selling anything." They closed their factory for a month so they could TRIPLE capacity. So, within the next year they're going to be at the 5,000 to 10,000 vehicles a month rate. It's not as fast as advocates would like, but it's coming, and there are enough people out there getting cars so that they can tell their neighbors, and people getting on lists. And you can sign up today [in October], to get on the list for the Prius.

BRAD: Even with the aggressive forecasts for all how many plug-in cars might get on the road, if it follows the hybrid pattern--eleven years after the start of the market we're still at about 2% of new car sales; is that discouraging?

FELIX KRAMER: That's right. It is discouraging, because two percent after 10 years of new-car sales [CROSSTALK]. Yeah, it's miniscule. If we have 250 million cars and we have one or two or three million hybrids, that's nowhere. And we did the projections. If you have a rate of adoption ten times as fast as that with new cars, you'd still only have about 10 or 15 percent of the installed fleet after 10 or 15 years -- which is why we have to convert cars.

Cars stay on the road a lot longer than people think, and if we fix the cars that are five years old, ten years old, we've got a solution. And people think cars only last only five or six years. That's the first owner. They go on for a decade or two, new UPS trucks drive 300,000 miles, two drive chains during that time. So, they stay around.

[AUDIENCE MEMBER]: [INAUDIBLE about converting cars to natural gas that put out no pollution]

FELIX KRAMER: So, natural gas has this name called "natural." So, it's good, right? and clean. Clean vehicles, clean buses, and they are essentially zero on conventional emissions. But they're still a fossil fuel. They're 20 to 30 percent lower CO₂ than gasoline, which is nice, but if you read the recent studies you'll see that when you take into account the whole cycle, including the emissions of methane, which is a 20 time greater greenhouse gas, in the process of extracting and producing natural gas, it may be WORSE than gasoline.

So, you know, I believe that there's a role . . . a plug-in hybrid, if we can get low-carbon liquid fuel, there completely complementary with a plug-in hybrids. For the range-extension fuel, if we can go to biofuels or biodiesel, it's zero-carbon, those sorts of things, fine. But natural gas? T. Boone Pickens put in \$50 million to try to persuade us to convert vehicles. They passed some legislation to pay up to \$25,000 to \$50,000 a vehicle to do some conversions. He's still trying to get that to happen. He backed off and said, "Oh, just for large vehicles, not for passenger vehicles."

So, I think that, you know, in terms of the practicality, for large vehicles, if I had to choose, would I rather have the natural gas vehicle, or gasoline or diesel vehicle for a large vehicle? Absolutely! Natural gas is better. But really, we want to get off fossil fuels, and natural gas doesn't do that.

[QUESTION FROM AUDIENCE MEMBER]: [INAUDIBLE about a group working to convert garbage with microbes to natural gas and water; still working on it]

FELIX KRAMER: Yeah. At that point you think, if you factor it in, because of the natural gas going somewhere else otherwise, or turning into methane in a landfill, you're better off. So, if we can get natural gas from that sort of way, plug it, and put it into cars, that's okay?

[AUDIENCE MEMBER]: [INAUDIBLE about the availability of the Leaf;; in 2012-2013 the factory in Kentucky will be producing more vehicles]

FELIX KRAMER: Yeah, and if you want a Leaf now, contact your dealer, because some people who sign up for them wind up not buying them. So, you can get a Leaf easier than you think. Other questions? Brad, I want to give you one of these [yellow dongle]. This is a souvenir from the campaign. And I want to thank you.

BRAD: Introduces Lisa Margonelli, next speaker.