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PLUGGING INTO ENERGY INDEPENDENCE WITH 150 MPG VEHICLES

HEARING

BEFORE THE

SELECT COMMITTEE ON
ENERGY INDEPENDENCE
AND GLOBAL WARMING
HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

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HEARING ON PLUGGING INTO ENERGY INDEPENDENCE WITH 150 MPG VEHICLES

THURSDAY, JULY 12, 2007

HOUSE OF REPRESENTATIVES,
SELECT COMMITTEE ON ENERGY INDEPENDENCE
AND GLOBAL WARMING,
Washington, DC.

The committee met, pursuant to call, at 10:05 a.m., in room 2175, Rayburn House Office Building, Hon. Edward J. Markey (chairman of the committee) presiding.

Present: Representatives Markey, Blumenauer, Inslee, Solis, Herseth Sandlin, Cleaver, Hall, Sensenbrenner, Shadegg, Walden, Sullivan, Blackburn, and Miller.

The CHAIRMAN. This hearing is called to order.

The goals of achieving energy independence and reducing our global warming pollution cannot be adequately addressed without a transformation of our transportation sector. More than any other, this sector lies at the very nexus of these twin problems which are facing our Nation. Two-thirds of the oil which we consume every day currently goes into the transportation sector.

It is a simple fact that during the years after Congress mandated a doubling of fuel economy standards from 13.5 to 27.5 miles per gallon it dramatically reduced our oil dependence. During that period our oil imports dropped from 46.5 percent in 1977 to 27 percent in 1985. But since then, our fuel economy standards have been stuck in neutral or even in reverse and our dependence on foreign oil has skyrocketed to roughly 60 percent.

Plug-in hybrid electric vehicles hold the potential to radically transform our use of oil. While the transportation sector is powered mostly by oil, the nationwide electricity grid runs on very little, only 3 percent according to the Energy Information Administration. Increasing the use of plug-in hybrids can help to make driving much less petroleum intensive by using electricity.

Such a transformation could have an incredible effect, according to the Department of Energy's Pacific Northwest National Laboratory. Replacing our passenger vehicle fleet with plug-in hybrids could reduce our oil consumption by 6.5 million barrels a day and our global warming by 27 percent.

Moreover, turning our vehicle fleet into plug-in hybrids would not require a significant expansion of our electrical infrastructure, because plug-in hybrids would primarily be charged at night during off peak hours. That same study found that 73 percent of our existing passenger fleet could be powered using the existing electrical generation infrastructure.

Now some automakers have produced plug-in hybrid prototypes and are beginning to announce long-term plans to manufacture them. We need to ensure that these promises not only become reality, but they are surpassed.

We cannot afford to wait 5 years or more to begin seriously looking to unlock the potential of this technology. It is already possible to convert the roughly 1 million hybrid vehicles that will be on the road this year into plug-in vehicles capable of getting 150 miles per gallon.

This conversion would allow existing hybrids to begin travel between 20 to 60 miles on a single charge. The next generation vehicles would allow Americans to go from 0 to 60 miles on barely a drop of oil.

Consumers were clamoring for a revolution in automotive technology. Innovation such as plug-in hybrid should not have been sitting on the shelf for so long. After all, this isn't rocket science, it is auto mechanics.

We have to make sure that we pay attention to all of these new technologies that have the potential to reduce our oil dependence and emissions of heat trapping gases and listen to the American people all across the country who are calling for them. We have the technology, we have the innovation. The only thing that has been missing is the will.

And now I would like to turn and recognize the ranking member of the select committee, the gentleman from Wisconsin, Mr. Sensenbrenner.

[The prepared statement of Mr. Markey follows:]

STATEMENT OF CHAIRMAN EDWARD MARKEY (D-MA)
SELECT COMMITTEE ON
ENERGY INDEPENDENCE AND GLOBAL WARMING
"PLUGGING INTO ENERGY INDEPENDENCE WITH 150 MPG VEHICLES"
JULY 12, 2007

This hearing is called to order.

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Two-thirds of the oil we consume everyday currently goes into the transportation sector. It is a simple fact that during the years after Congress mandated a doubling of fuel economy standards from 13.5 to 27.5 miles per gallon it dramatically reduced our oil dependence. During that period, our oil imports dropped from 46.5% in 1977 to 27% in 1985. But since then, our fuel economy standards have been stuck in neutral or even reverse and our dependence on foreign oil has skyrocketed to roughly 60%.

Plug-in hybrid electric vehicles hold the potential to radically transform our use of oil. While the transportation sector is powered mostly by oil, the nation-wide electricity grid runs on very little -- only 3% according to the Energy Information Administration. Increasing the use of plug-in hybrids can help make driving much less petroleum-intensive by using electricity.

Such a transformation could have an incredible effect. According to the Department of Energy's Pacific Northwest National Laboratory, replacing our passenger vehicle fleet with plug-in hybrids could reduce our oil consumption by 6.5 million barrels per day and our global warming pollution by 27%.

Moreover, turning our vehicle fleet into plug-in hybrids would not require a significant expansion of our electrical infrastructure. Because plug-in hybrids would primarily be charged at night during off-peak hours, that same study found that 73% of our existing passenger fleet could be powered using the existing electrical generation infrastructure.

Some automakers have produced plug-in hybrid prototypes and are beginning to announce long-term plans to manufacture them. We need to ensure that these promises not only become reality, but are surpassed.

We cannot afford to wait five years or more to begin seriously looking to unlock the potential of this technology. It is already possible to convert the roughly 1 million hybrid vehicles that will be on the road this year into plug-in hybrids, capable of getting 150

miles per gallon. This conversion would allow existing hybrids to begin traveling between 20 and 60 miles on a single charge. These next generation vehicles would allow Americans to go from zero to 60 miles on barely a drop of oil.

Consumers are clamoring for a revolution in automotive technology. Innovations such as the plug-in hybrid should not have been sitting on the shelf for so long – after all, this isn't rocket science, it's auto mechanics. We have to make sure that we pay attention to all of these new technologies that have the potential to reduce our oil dependence and emission of heat-trapping gases and listen to the American people all across the country who are calling for them.

We have the technology, we have the innovation, the only thing that has been missing is the will.

And now I would like to recognize the Ranking Member of the Select Committee, the gentleman from Wisconsin, Mr. Sensenbrenner.

Mr. SENSENBRENNER. Thank you very much, Mr. Chairman.

Since the select committee's inception in April I have repeatedly stressed four principles that I and many Republicans believe must be part of any policy addressing global warming. First, I said any policy must produce tangible improvements to the environment. I also believe that any policy must protect the economy and include participation of all the industrialized countries, including China and India.

Global warming policy must support advanced technological progress because technology, not taxes or regulation, provide us with the best options to reduce U.S. dependency on foreign oil and to reduce greenhouse gas emissions. Between established technology like nuclear power and solutions like fertilizing carbon dioxide eating plankton, the range of technology possibilities to address oil dependency and greenhouse gas emissions are fascinating.

Researchers are reaching breakthrough technologies to improve existing ideas, and what better technology to win the race than a car. Hybrid car technology is in the marketplace and competing with the gasoline powered car. Recent news reports show they have reached speeds of over 100 miles per hour. Could this mean that the hum of the hybrid could replace the roar of the engine at the racetrack?

Plug-in hybrid cars hold even greater promise of reducing our reliance on foreign oil and greenhouse gas emissions. Early indications suggest that if this technology were fully employed, it could reduce oil consumption by 6½ million barrels a day and greenhouse gas emissions by 27 percent, which is very promising indeed.

Should plug-in hybrid car technology be the winner of this race to free us from foreign oil and greenhouse gas? The answer is I don't know and I don't think anybody else does either. It shouldn't be up to me or any of my colleagues in Congress to decide. Ultimately it should be consumers who decide when they choose which products they will buy. After all with gas prices what they are, I doubt it will take a Congressional mandate to sell a car that gets 150 miles to the gallon.

Despite the promise, plug-in hybrid technology is expensive and it is still unclear if it is effective on a mass scale. To be sure, it appears that this technology is still a breakthrough or two away from being parked in everyone's driveway. Maybe we will see breakthroughs in hybrid technology. Perhaps there is another technology that will move us beyond gasoline, such as biodiesel, hydrogen fuel cells or liquefied coal.

Already we are seeing the private sector taking interest in private or plug-in hybrid technology. Last month Internet giant Google partnered with A123Systems. They helped fund research that could produce some much needed breakthrough in battery durability. I am pleased that A123 President and CEO David Vieau is here to inform us about the research into this technology.

On Monday, Ford Motors and Southern California Edison announced the joint initiative on plug-in hybrid research. That is also good news, but while Ford Motor CEO Alan Mulally said that plug-in hybrids could probably be in showrooms in 5 to 10 years, he made no firm predictions or promises. Like any smart business, Ford Motors is waiting to see if technology develops before making

any significant financial commitment. We all know the U.S. domestic auto industry is not awash in cash these days.

Congress should be careful in its commitment, especially when it comes to funding research. Sure, there is promise in plug-in hybrid technology. I am glad to see the private sector is willing to fund it indeed, but I caution my colleagues against believing technological breakthroughs are merely as a result of money and funding.

For nearly 4 decades Congress devoted billions to nuclear fusion research hoping for a breakthrough in energy production. So far we are still waiting for commercial results. We can't afford to wait 4 decades for a breakthrough that will release us from our dependency on foreign oil.

We now know that hybrids are fast. The question is will they be fast enough to win this technological race. I hope today's hearing will help us to begin to answer this question.

I thank the chairman for the time and yield back the remainder of my time.

The CHAIRMAN. Gentleman's time is expired.

The Chair recognizes the gentleman from Washington State, Mr. Inslee, for an opening statement.

Mr. INSLEE. Thank you.

Over the break I experienced the yin and yang of global warming. I want to share this with the committee. The yin was I went hiking Saturday up in the Cascades in Washington State and saw mile after mile of dead and dying fir trees killed by the budworm that can ravage our forest because it doesn't get cold enough to kill them anymore.

Sunday, the next day I went to Everett, Washington and saw the roll-out of the Boeing 787 Dreamliner, an incredible piece of technology that reduces CO2 pollution 20 percent per passenger mile, one-fifth less CO2 emissions because of the use of technology.

Yesterday I talked to a guy named David Moore, who works at Vulcan, Inc. in Seattle. He is one the first to have a Prius plug-in, the user name 123 battery system. He got it converted in Boulder, Colorado, drove it back. The first 100 miles he did 80 miles a gallon. He does better now. He plugs it in at work, and I chided him because he is stealing electricity from Paul Allen, but he says it is only $0.15 a day, so it is not much of a hit. So he can commute 30 miles each way to work and spends $0.15 a day for the energy to run his car in his daily commute.

The number that got me in his description of his plug-in Prius is that, finally, since he got the car several months ago he has driven 1,200 miles before he had to put a gallon of gasoline in it. I think a promise to Americans that you can drive to work 30 miles a day, spend $0.15 on your fuel and go 1,200 miles before you spend a dollar to Saudi Arabia is a pretty good deal.

It is not future rocket science, it is here today. Plug-in hybrids are the technological cavalry. They have arrived just in time. We have to make sure they get implemented.

The CHAIRMAN. The gentleman's time has expired.

The Chair recognizes the gentlelady from Michigan, Ms. Miller.

Mrs. MILLER. I will save my time for the questions, Mr. Chairman. Thank you.

The CHAIRMAN. The Chair recognizes the gentleman from Oklahoma, Mr. Sullivan.

Mr. SULLIVAN. I waive, Mr. Chairman, and will submit my opening statements.

[The statement of Mr. Sullivan follows:]

Opening Statement by Congressman John Sullivan
Select Committee on Energy Independence and Global Warming
July 12, 2007
"Plugging into Energy Independence with 150 MPG Vehicles"

Mr. Chairman,

Thank you for holding this hearing today. I look forward to learning more about plug-in hybrid vehicles technology, which I understand will could some vehicles to achieve up to 150 miles per gallon.

One issue I hope this hearing will address will be the increase rate of electricity consumption by plug in vehicles and how that relates to the make up of our nation's power supply. It is important that we consider nation's electric grid is updated prior to a wide roll out of this technology. If a lightning bolt can darken New York City for hours, or as we saw a few years ago, several days, how do we know that the grid is strong enough to handle thousands of Americans electronically charging their cars?

In addition, almost 50% of our nation's electricity is derived from coal and almost 20% is from nuclear energy. It is important that we support and expand these technologies if we are going to put increased strain on our nation's electric grid.

Vehicle plug-in technology is exciting alternative technology and a method of increasing American's energy security. I support bringing new technology to the market and I hope this hearing will address some of these issues.

Thank you and I yield back the balance of my time.

The CHAIRMAN. The Chair recognizes the gentleman from Oregon.

Mr. WALDEN. Thank you, Mr. Chairman. I look forward to looking through the testimony. Unfortunately, I have some conflicts this morning and have to leave a bit early, but I think I am the newest Prius owner on the panel. My big old Chrysler died a couple weeks ago, and I went out and bought a Prius which I had been wanting to do for some time, because I wanted to get better gas mileage, and it certainly reduces emissions as well.

I am intrigued by the function of plug-in hybrids. As we know, they aren't readily available on the market yet. I know that if you recharge the hybrid and run it off the electricity, more than the gasoline, you emit one-fourth the amount of carbon into the atmosphere if the electricity production comes from gas fired energy. The electric energy is produced somewhere. So there are other tradeoffs certainly in the environment.

In the Northwest we are fortunate because we have a huge hydro grid. So if you want the absolute lowest carbon emission it may be one of the lowest, if not the lowest, from hydropower. So in our part of the world if you can plug them in, you are getting renewable energy right from the start into the car, and I think this will go a long way.

I do think there needs to be greater development on the batteries themselves, and hopefully a domestic battery industry could emerge as well as opposed to those made in China or Japan or somewhere else so we truly can become more energy independent in America.

I am intrigued by all of this. I intend to take the testimony with me, and I apologize for having to leave early today but I look forward to America moving forward.

The final comment I would make is that in central Oregon is a company who has been on the forefront of hydrogen fuel cell technology, and I know they are working with some automakers to use a hydrogen fuel cell to power some of the electrical needs of the car, which, as we know, is significant now and is powered through gasoline producing the electric energy that is used in the cars. It is innovations such as those that may come about in the years ahead that will help move this process along.

Thank you, gentleman.

The CHAIRMAN. I actually drive a Toyota Camry. The Prius does a lot better, but you really should upgrade.

The Chair recognizes the gentlelady from California.

Ms. SOLIS. Thank you, Mr. Chairman. I am delighted that you are having this hearing today. I often complain about the hardships that my district faces in Los Angeles, particularly East Los Angeles, one of the harder hit areas that has various environmental impacts, one being smog and congestion on the road.

One thing I have to say about the State of California is that we have gone beyond by extending past credit for those people who do purchase hybrids. In fact, our carpool lanes are made more accessible for those who purchase those vehicles.

I am really proud to say today that we heard mention from the other side of the aisle about the innovations that are coming forward from places such as obscure districts like mine in the 32nd

District where Southern Cal Edison is on the partnership with the Ford Motor industry. I think it is wonderful those creations are occurring in southern California. We need to continue to promote that.

I am a strong advocate to see that we do as much as we can and bring about change at the local level, the grass roots level, because I really believe that our young people and our children when we see them at our local schools often ask about what are we doing about changing climate change and what are we doing to help improve the environment and what kind of future am I going to have. And I think we all have to act responsibly and make good decisions.

So I applaud the witnesses for being here today and thank the chairman for the opportunity for us to hear the witnesses.

The CHAIRMAN. The gentlelady's time is expired.

The Chair recognizes the gentleman from Arizona, Mr. Shadegg.

Mr. SHADEGG. Thank you, Mr. Chairman. I am glad to join in this love fest. I want to thank and compliment you for holding this hearing today on plug-in hybrid vehicle technology and the potential to reduce our reliance on oil and particularly on imported oil.

I believe it is one of those great opportunities for bipartisan cooperation. Clearly it is incumbent upon all of us in America and especially upon policymakers to pursue alternatives to oil and alternatives to imported oil, and plug-in hybrid technology holds great potential.

In my State of Arizona we face air pollution problems and we face long commutes, and the possibility of being able to do those with hybrid vehicles that run on electricity and do not further pollute or cause additional greenhouse gases is a great potential. I certainly agree that there are tremendous possibilities for hybrid vehicles. And in addition to the gain we can achieve from them in terms of issues of environment and issues of global warming, there is also the issue of strategic concerns.

I want to compliment all of our witnesses for being here and thank them. In particular, I want to note that I have heard Mr. Gaffney say that oil should be a normal commodity and not a strategic one. I am greatly concerned about our reliance on oil from foreign nations who often are not our friends and who are hostile to us.

I look forward to hearing from the witnesses today and our testimony, but I, like my colleague Mr. Walden, have a conflict and will have to leave for part of the hearing.

I would note that in the Energy Policy Act last year I inserted language to encourage the U.S. Department of Energy to ramp up its development of battery technology. I think it is well-known that we lag behind the Japanese in battery technology. That is one of the reasons we are not as far ahead in hybrids and plug-in hybrids as we might be.

Fortunately, that language remains in the bill and it is now law and we are doing more aggressive things. I hope we can do even more. This is certainly a step in the right direction, and we need to pursue every alternative energy source we can, and again I compliment the chairman on the hearing.

The CHAIRMAN. I thank the gentleman and I thank him for his participation, leadership on this issue.

The Chair recognizes the gentleman from Missouri, Mr. Cleaver.

Mr. CLEAVER. Thank you, Mr. Chair, and thank you for the hearing. I will waive an opening statement in favor of questions at a later time. Thank you.

The CHAIRMAN. The Chair recognizes the gentlelady from South Dakota, Ms. Herseth Sandlin.

Ms. HERSETH SANDLIN. I too will forego my opening statement, but would like to point out that I drive flex fuel vehicles and look forward to the day when I can drive a plug-in flex fuel hybrid and look forward to Mr. Gaffney's testimony.

The CHAIRMAN. The Chair recognizes the gentlelady from Tennessee, Ms. Blackburn.

Mrs. BLACKBURN. Thank you, Mr. Chairman. I thank you for the hearing and I want to thank our witnesses for taking the opportunity to come and talk with us on this issue.

As you have heard, we are all interested in what we do to achieve energy independence, how we go about making energy independence an attainable realistic goal for our country, and we appreciate your participation in the discussion today. I am looking forward to what we are going to hear about the plug-in hybrids and their being a part of the solution as we move forward.

Where I come from right outside of Nashville, Tennessee, we have a lot of auto manufacturing. There is so much creativity and so much innovation that is going on in this industry, and we want to be certain that we encourage that.

Mr. Shadegg just talked about a provision he had in the energy bill we had passed 2 years ago now. We are also working on an additional bill that is going through our committee, just finished, our Energy Commerce Committee. We are looking at how to spread that innovation.

I do have some concerns. One is the cost. Hybrids are about $3,000 more than a conventional car, and then a plug-in hybrid is about $6,000 more. As you are talking with consumers that becomes an obstacle. So that is something that I am concerned about.

Then the battery is only going to last a 6- to 8-year period of time. Then you have the disposal problem with the battery. So those are all obstacles and problems that need to be solved as we move forward on the issue.

Also, as we view this I want to be certain we don't pick winners and losers on energy technology. There should be choices through a free market for our consumers. Right now Americans are choosing not to buy hybrids. It is only 2 percent of our new car sales. And so although some are selling well, others are not. In the future they may choose to buy hybrids, but we need to be certain that is done by incentives in the market and not mandates from the government. We need to know that this is going to be a part of our discussion, a part of our solution, plug-in hybrids.

And we appreciate again your work, Mr. Chairman, the staff's work and your work we appreciate.

I yield back.

The CHAIRMAN. Gentlelady's time has expired.

The Chair recognizes the gentleman from New York, Mr. Hall.

Mr. HALL. Thank you, Mr. Chairman. Thank you all, our witnesses today.

In its brief history this committee has addressed many of the critical topics related to our dependence on foreign oil and the impacts of global warming, but the subject of today's hearing may be the most important yet.

The overwhelming majority of our dependence on foreign oil is directly tied to the cars we drive. There is simply no way to be serious about lessening the influence of OPEC, reducing prices at the pump of working families or cutting down on tailpipe emissions that are choking our air and warming our planet without making our cars more efficient.

I and my wife drive American made vehicles. I decided to vote with my dollars for an American made hybrid. I could have had 20 miles per gallon more by driving a Japanese hybrid. If they build it, some of us will come. I believe actually that it is essential that we compete as a country and that our industry compete for the efficiency market because that is a big part of why U.S. auto manufacturers are losing market share when one compares American hybrids and the average mileage available in an American car with that available in a Japanese or another foreign made car.

I have also noticed that there are currently systems available for my car which would take it from 30 some miles per gallon to 60 some miles per gallon as a retrofit, and from the Prius, which would take it from 50 some to over 100. In the after market, third party market, the systems that are being built by small companies that inherently have to cost more money to the consumer because they are not dealing with the scale and quantity of hundreds of thousands of vehicles that the original manufacturers could crank out.

So the sooner that we hopefully get on board and use the ingenuity that we have been hearing about and the creativity and technological prowess this country is famous for, the better.

The challenge for this Congress is how to push plug-ins over the final hurdle from being a novelty to being the norm. This means pioneering companies like those represented today will grow to economies of scale, help to spur wholesale investment in Detroit in this technology, and make plug-ins an everyday option.

I yield back. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you. The gentleman's time has expired, and all time for opening statements by members of the select committee has expired. We will now turn to hear from our witnesses, and I would like to begin by recognizing our first witness, David Vieau, who is the President and CEO of A123Systems. His company is a leader in the plug-in hybrid business, fitting existing hybrids with the batteries and equipment needed to convert plug-in hybrids. Mr. Vieau brings more than 30 years experience in high technology and component businesses. We welcome you, Mr. Vieau. Whenever you feel comfortable, please begin.

STATEMENT OF DAVID VIEAU, PRESIDENT AND CEO, A123SYSTEMS, WATERTOWN, MASSACHUSETTS

Mr. VIEAU. Thank you very much, Mr. Chairman, Congressman Inslee, and Congressman Sensenbrenner and the rest of the com-

mittee, for being here today and for the fine work that you are doing to reduce our dependency on foreign oil and to reduce the carbon emissions that so plague the climate that we live in today. It is a great opportunity for us to be here and tell you our story a little bit. I appreciate that as well.

Outside this building today we have a couple of demonstration vehicles that implement some of the technology that you have spoken so eloquently about. These vehicles, in particular the Toyota Prius vehicle that we have a demonstration of with our plug-in hybrid technology, demonstrates fuel mileage according to national testing in excess of 100 miles per gallon and for commuters that drive less than 40 miles per day, urban driving, testing would indicate between 100 and 150 miles per gallon.

The benefits to us on a vehicle-by-vehicle basis is a reduction in fuel consumption for the average American of over 80 percent and a reduction of the carbon emissions of over 60 percent on a national basis, inclusive of the emissions associated with the production of the electricity that is used to create the energy for the vehicle.

This capability is made possible by what I would say is the convergence of three events over the last 5 years, the first of which is the widespread availability of production hybrid electric vehicles, and that was certainly stimulated to a great degree by the work done here to create tax incentives and to increase awareness of those capabilities.

The second thing was the development of advanced lithium ion battery technologies at A123Systems in Watertown, Massachusetts.

The third of which was the creation of a very eloquent and novel system to employ these in a retrofit manner to allow us to immediately begin to take advantage of these capabilities. That would be in a battery range extension module that can be applied to the vehicle to increase the energy capacity so the car can depend more on electricity and less on polluting gasoline.

The car is called the plug-in hybrid vehicle. I think everyone here is quite familiar with them. The nature of the vehicle is that it provides additional electrification to a hybrid vehicle. It can be plugged in to charge the batteries from a standard household circuit.

A123Systems started 5 years ago in Watertown, Massachusetts with some technology relations from MIT and five people and a $100,000 Department of Energy SBIR grant.

Today we have raised more than $100 million of private equity from a combination of venture capital sources and major corporations. Our backers include from a corporate standpoint General Electric, Procter & Gamble, Motorola, Qualcomm, Alliance Bernstein and a host of the top venture capital companies in America.

We have over 380 employees today around the world, including our facilities in Ann Arbor, Michigan, where we do research and defense related battery technology development, and our facility in Watertown and our facility in Toronto, Canada.

We initially took our technology to a commercial partner, Black & Decker, to work with them to create an advanced cordless power tool set, first of all to help them advance the state-of-the-art and add space with more powerful batteries, and second to demonstrate the capability of this new technology on a commercial scale.

This has been made possible by this nano phosphate material which we licensed from MIT and commercialized in our labs. It brings to the market a combination of greater power, better safety, improved safety and much longer life, both calendar life and cycle life, in a combination of which had never been available previously.

As a result of this we have been selected by General Motors to be a partner in development of their batteries and battery systems for the next generation plug-in hybrid vehicles which we expect to see in the market in the next 3 to 5 years.

We have partnered with BAE Systems to create battery capability to help them with the electrification of commercial buses, city buses, and in particular the work on the program for the DaimlerChrysler bus system which is used in New York City. The implementation of our battery capability in those systems saves over 3,400 pounds per bus and significant increase in the fuel mileage or the benefits of the electrification of vehicle is the result of it and more than doubles the life of systems.

We have partnered with General Electric Corporation on our first generation fuel cell hybrid bus technology, and we are participating in a number of other commercial programs with domestic and international auto companies.

I say all of this because I want you to understand the seriousness that we take in our business and to understand the primary nature of the business A123 is to create battery systems that can be implemented by the OEMs themselves and through the major manufacturers of not only automobiles but also trucks and buses.

We have a message today which I hope is the one key message to leave with you. We believe that in all the legislation that you have pending in front of you here today in Congress, nothing is greater than this plug-in hybrid vehicle module conversion, and bringing forward the opportunity to get a savings of 80 percent reduction in fuel usage on a consumer basis and a 60 percent reduction in emissions with little or no change in the infrastructure we have and it can be done in the immediate future.

I think it is a very strong statement, and that is why we as a company have been supporting the activity of creating an after market opportunity building modules that can be put in vehicles, not 5 years from now, but tomorrow.

With these vehicles there is certainly some criticism at times about after market activities and concerns about the viability of it. I will say to you that we are very serious about making sure that these vehicles have been NHTSA tested for safety and crash readiness and EPA certified for emissions to provide the increases that we have and improvements that we have so testified to.

The CHAIRMAN. If you could summarize.

Mr. VIEAU. In summary, I want to thank you for the opportunity here. The cost of the systems is a bit significant today. We look forward to your support with tax credits, and thank you for the opportunity to be here.

[The statement of Mr. Vieau follows:]

Testimony Of

David Vieau

CEO

A123Systems

Watertown, Massachusetts

Before The

United States House Of Representatives

Select Committee On Energy Independence And Global Warming

Concerning

Plugging Into Energy Independence With 150 MPG Vehicles

July 12, 2007

A123Systems Role In The Coming Hybrid And Plug In Hybrid Revolution

A123SYSTEMS' ROLE IN THE COMING HYBRID AND PLUG IN HYBRID REVOLUTION

Mr. Chairman, Congressman Inslee, Congressman Sensenbrenner, and other Members of the Committee,

This Committee's interest and efforts in fostering new American technologies in the critical effort to slow down climate change and reduce our dependence on foreign oil is well known and deeply appreciated. I thank you for the opportunity to appear before you today to explain and answer questions about A123Systems' program for developing and marketing a state-of-the-art lithium ion battery which we and others believe will help enable this nation to lead a world wide plug-in hybrid transportation revolution, and the importance of a modest transitional tax credit for plug-in hybrid conversion modules so that revolution can start now.

Let me explain.

The Company And Its Products

A123Systems started 5 years ago as an MIT spin off with a $100,000 DOE SBIR grant. Today it has raised over $100 million, has over 380 employees and operates facilities in Watertown, Massachusetts and Ann Arbor, Michigan. We sell millions of batteries annually to Black and Decker, Dewalt and others for high powered handheld

applications. We also are developing higher powered solutions for the aerospace and defense industries. T/J Technologies, which is our recently acquired Ann Arbor facility, is developing batteries for hybrid vehicle applications for the Army. We have been chosen by GM, and other major American and European automakers, to help develop and power their hybrid and plug-in hybrid sedans, SUVs, trucks, buses and heavy equipment moving vehicles which will be coming on line over the next 3 to 5 years.

This has all been made possible by our development of a unique Nanophoshate based lithium ion battery with a combination of power density, durability and safety in excess of anything mass produced on the market today. This assertion is confirmed by the ever growing list of American and European automakers and partners who are choosing A123Systems as the power source of choice in enabling them to enter the increasingly attractive and profitable hybrid era.

The automotive industry is in the middle of a critical transition to electric drive. Fueled by strong consumer demand for greener vehicles and a growing awareness of our greater responsibilities to our planet and our national security, there are now over 65 hybrid vehicle launches planned by 2010. We will continue to work with all the key players to optimize our technology and provide leading price performance in this market.

The next generation of technology beyond the conventional hybrid is the plug-in hybrid. This significant advance in the technology is one where the US automakers have established technological leadership and which delivers many benefits including

government verified 100 MPG or greater efficiencies at a fraction of the cost of gasoline. A123Systems is a leading supplier of battery technology for hybrids and plug-in hybrids. We are working with General Motors and other leading American and European automobile and heavy equipment manufacturers to validate and introduce this technology into the market.

Over the years, Congress has been in the forefront of recognizing the need to nurture these kinds of breakthrough technologies by insuring early stimulation through the wise use of tax credits to kick start consumer demand. Putting the CLEAR ACT in place in 2005 was critical to both educating the public and producing the sales volumes that have lead to ever improving costs and economics. As a result, today's rapidly growing demand for hybrid vehicles is a tribute to the public's underestimated desire to do something about the health and national security risks of ever rising petroleum dependency when presented with economic choices.

Now we need to move quickly to do the same thing to achieve the far greater oil and emission savings of plug-in hybrids.

Clearly, the number one urgent message I want to leave you with today is that in all the legislation pending before the Congress, nothing other than the plug-in conversion module holds the promise, starting this year, of reducing oil consumption by 80% and emissions by 60% on a car by car basis, with very little infrastructure change.

Think about it. That is a strong statement. And those of you who have seen or driven one of our standard hybrids with an A123Systems plug-in conversion module in the spare tire well will understand the significance of what I am saying. Seeing and testing is believing.

A123Systems has given substantial thought to how best to move along the continuum of producing millions of high performance A123Systems lithium ion batteries for handheld applications today to adding the bandwidth required in 3 to 5 years to supply the major manufacturers with batteries for their fully designed and tested original equipment plug-in hybrid vehicles.

So we have come up with an approach that marries our American battery breakthrough of today to the millions of original equipment conventional hybrids that are already rolling off the major manufacturers production lines now and through the next decade. The answer was to acquire Hymotion, a leader in the field of companies utilizing our batteries in Plug-In Conversion Modules that can be installed in the spare tire well of most existing and future hybrids.

The result of that effort, with your help, can be a giant leap right now into the future of the plug-in hybrid revolution.

Most of today and tomorrow's conventional hybrids -- costing as little as $22,000 -- can be, and some already have been, successfully, safely and quickly converted into plug-in hybrids – increasing their efficiency from 50 or so MPG to as high as 150 MPG in city

driving. In fact, DOE's Argonne National Lab tested an earlier version of this module providing independent validation of the 150 MPG urban efficiencies that plug-in hybrids achieve. Prototypes now being driven around the country, including here in Washington, have been achieving the same results.

These mass produced, standardized modules will be certified to meet all applicable new car safety and emissions test standards. They will be installed by trained and certified mechanics in less than 2 hours, without any changes to the underlying electronics or materially useable space of the production hybrid other than the installation of the plug in the rear bumper. They can be charged from a standard plug for 4 hours, providing up to 40 miles of electric assisted drive for approximately 60 cents a charge. Off peak night time charging improves a utility's load factor and efficiencies, while further saving consumers energy costs.

These modules will be marketed to fleets later this year and individual consumers in 2008. The initial prices will be in the range of $10,000 for a 40 mile module to $7,000 for a 20 mile module. As we have seen with conventional hybrids, the prices will come down as the volumes go up.

That is why a modest transitional tax credit, at least until the OEM's hit the market in volume in the next decade, can make such a difference in a quick start to the oil and emission savings of plug-ins as well as the education of the American consumer as to what is possible now.

With a $3,300 tax credit for the 40 mile module, the payback period for a fleet owner with $3.50/gallon gas is about 2 years, with annual travel of 35,000 miles. The payback period for the average commuter using a 30 mile module to drive 11,000 miles annually would be about 4.5 years. And these calculations place no value on the net reduction of approximately 100 tons of carbon dioxide and other emissions over the life of each converted vehicle.

Think of what a difference these modest tax credits could make over the next several years. There will be almost 1 million standard production hybrids on the road in the US by the end of this year. With almost two dozen hybrid models expected by the end of 2008, and over 60 different models by 2010, there will be 5 million standard hybrids by 2010 and perhaps as many as 15 million by the time significant plug-in production is rolling out of the major's plants. With a meaningful start from this year's energy bill, many of these vehicles would become the leading edge of the major oil and emissions savings of the plug-in revolution.

With the provision in the Chairman's bill that the credit can never exceed 35% of the cost of a module, the credit will decline as the costs come down and then finally disappear at the end of the 3 year transition period.

I thank the Chairman, Congressman Inslee and many others for their tireless efforts and urge you all to continue to spread the word and do everything you can to enact a modest

transitional credit for plug-in conversion modules as part of this Session's energy legislation. With this tax credit, the average American can be in a full, responsive, comfortable sedan that can get over 100 MPG and cut net emissions by 60% for under $30,000 today, and continuing to decline over time. That is a lot sooner and far more tangible than many of the other initiatives currently contained in the pending bills.

To any of the skeptics whose interests are best served by delaying the start of the plug-in era, I would say we welcome the NHTSA and EPA testing that will be conducted this fall -- as well as any other suppliers that meet the safety and environmental standards required to qualify for the credit in the Chairman's proposed bill and all other similar proposals in both the House and Senate.

In conclusion, thank you for the opportunity to further explain what this technology can mean to our nation's energy future, and the importance of acting now. Initially, we estimate a five fold increase in demand for these modules from an increasingly responsive American public as a result of providing for this early responder tax credit. Moving up by years the availability of this breakthrough, so important to our national security, will:

- Introduce a public hungry for action to a new American technology that lets them participate in a transportation revolution they have already started with their unprecedented demand for standard hybrids .
- Gather invaluable experience and data for the next generation of factory produced vehicles through earlier wide spread use of these higher tech batteries in real volumes in the everyday world.
- Stimulate battery cost reductions sooner from volume sales
- Advance by years the much needed 80% reduction in oil consumption and 60% emissions savings associated with every plug in on the road.

- Serve the purpose of potentially speeding up the roll out of factory produced plug ins as a result of the growing public awareness and response to module savings.

If any of you have not yet seen or driven one of these cars, just let me know and we will bring a car to you.

Thank you again for all your efforts and time. We stand ready to help in any way we can.

The CHAIRMAN. Thank you, Mr. Vieau, very much. You will have plenty of opportunity during the question and answer period.

Our next witness, Rob Lowe, has earned an Emmy nomination, two Golden Globe nominations for his work on The West Wing. He joins us after most recently transitioning from White House Communications Director on West Wing to California Senator and Republican presidential candidate in the new show, Brothers and Sisters. He believes America is ready for a great leap as well. Mr. Lowe is a nationally recognized environmentalist.

We thank you for coming to testify today. Whenever you are ready, please begin.

STATEMENT OF ROB LOWE, ACTOR AND ADVOCATE

Mr. LOWE. Thank you, Mr. Chairman. Congressmen Inslee, Sensenbrenner and other members of the committee, thank you for the opportunity to appear today before this distinguished panel. And although I have been a senior adviser to the President and am currently a Republican junior Senator from California running for President, I am honored to sit before you today because you are the genuine article. When it comes to doing the Nation's business, we all know that you have the ability to be the real stars. So thank you.

Like many Americans, I have watched with increased frustration as our country drifts under the status quo without any concrete national policy for energy independence. With the issue of global warming entering the cultural zeitgeist, it seemed like that might break the deadlock, but so far it appears to have not.

And now, in the war on terror in which our oil addiction helps fund our enemies and we ask our best and brightest to serve and to sometimes to die at least in part to protect our oil needs, surely we here at stateside can and must use this critical moment in time to at last begin implementing a responsible and practical plan for energy independence.

A large segment of the public already knows this: I believe American consumers are patriotic and they are smart and they want to do their fair share. They have heard of the potential of these electronic cars, fuel cells and the dreams of hydrogen, but today and even in the near future they can't go out and actually buy any of these dreams. That is why I have come here today.

I would like to suggest with your help and the help of your colleagues we may in fact be able to pave the way to use existing breakthrough technology to bring far more efficient green cars to the American public right now.

New American technology exists today that can transform most conventional hybrids getting 40 to 50 miles per gallon into plug-in hybrids getting 100 to 150 miles per gallon, can go 40 miles on a single 4-hour charge, costs 60 cents. You plug into a standard electrical outlet and it can save the average consumer over $1,000 a year and fleet users up to $3,500 in gas costs while saving 100 tons of CO2 emissions over the life of the car.

I recently heard about A123Systems and their batteries, which are powerful, smaller, safer and longer lasting than anything else on the market. They fit in the spare tire well. They can increase

the on board electrical storage by many multiples and cut gasoline consumption by 80 percent, emissions by 60.

Now, I am not a MENSA member, but I play smart guys on TV. So I wanted to know more. When I found out that technology has been chosen by GM, I read the independent assessment done by the Department of Energy's premier Argonne Lab last summer which resulted in 150 to 250 mile per gallon in urban driving, and I checked with some friends who have the cars and they confirmed these results.

I found this to be amazing. With this education I came here today to ask you why not exercise your leadership right now to put in place a wartime-like mobilization plan to find out if this new technology can cut our oil consumption by 80 percent starting right now. Certainly Congress should be able to provide the same kind of early user tax credits for these plug-in modules that were so critical in bringing down the prices and jump starting the current growth and demand for standard hybrids.

Obviously game changing advances are sometimes met with indifference or even resistance from the establishment. With that said, can't our amazing and powerful Detroit automotive industry be given a message, together with effective incentives, to speed up their conversion to plug-in hybrids by using this or any other technological advance?

In The West Wing someone asked my character, Sam Seaborn, why he wasn't practicing law at a big law firm, making a lot of money, instead of grinding it out in a life of public policy. And he answered with this story:

In 1940 our Armed Forces weren't among the 12 most powerful in the world, but obviously we were going to fight a big war and Roosevelt said the United States would produce 50,000 planes in 4 years and everybody said it was a joke. It turns out it was because we produced 100,000 planes. We gave the Air Force an armada that would block out the sun. That is the spirit we need here.

So in the end, the choice before this Nation is simple: Waiting years for any viable mass marketed plug-in under the status quo or a major push now to jump start the conversion of plug-ins from the growing millions of hybrids coming to our roads. With what is at stake in the world today it is not much to ask. We have done far more in the pursuit of far less.

And yet, when inspired our government is capable of amazing achievement. As I once said on The West Wing, over the past half century we have split the atom, we have spliced the gene and roamed Tranquility Base. We have reached for the stars and never have they been closer to being in our grasp. New science, new technology is making the difference between life and death and we need a national commitment equal to this unparalleled moment of possibility.

That was fiction. We are here today to deal with reality, but the stars are aligned. The time is now and patriotic and smart Americans await this Congress' successful efforts.

I thank you for your time and for your service to our country.

[The statement of Mr. Lowe follows:]

Testimony Of

Rob Lowe

Before The

United States House Of Representatives

Select Committee On Energy Independence And Global Warming

Concerning

Plugging Into Energy Independence With 150 MPG Vehicles

July 12, 2007

Cars, Plugs And 100,000 Airplanes

Cars, Plugs And 100,000 Airplanes

Mr. Chairman, Congressmen Inslee and Sensenbrenner, and other Members of the Committee,

Thank you for the opportunity to appear before you today on this distinguished panel.

Although I have been a Senior Advisor to the President and am currently the junior Senator from California running for President, it is only in a world of entertainment and fiction. I am honored to sit before you today because you are the genuine article, and I know that when it comes to leadership and shaping our nation's future, you have the ability to be the real stars.

Like many Americans, I have watched with increasing frustration as our country drifts under the status quo, without any concrete national policy for energy independence. With the issue of global warming entering the cultural zeitgeist, it seemed that might break the deadlock. But so far it has not.

And now, in a war on terror in which our oil addiction helps fund our enemies, we ask our best and brightest to serve, and sometimes die, at least in part to protect our oil needs. Surely, we here State side can and must use this critical moment in time to actually begin implementing a responsible and practical plan on the road to energy independence.

A large segment of the public already knows this: I believe American consumers are patriotic and smart; they want to do their part. They have heard of the potential of electric cars, the promise of fuel cells and the dream of hydrogen. But today, and even in the near future, they can not yet go out and buy any of these potentials, promises or dreams.

And that is why I have come here today. I want to suggest that, with your help and the help of your colleagues, we may in fact be able to pave the way to use existing

breakthrough technology to bring dramatic, far more efficient "green" cars to the American public now.

I am here to use whatever attention I may attract to tell Members of Congress and our patriotic consumers that new American technology exists today that may:

- transform most conventional hybrids getting 40 to 50 MPG into plug-in hybrids that can get 100 to 150 MPG,
- go 40 miles on a single 4 hour charge that costs 60 cents from a standard electric outlet, and
- save the average commuter over $1,000/year and the fleet user up to $3,500/ year in gasoline costs while saving 100 tons of CO2 emissions over the life of each converted vehicle.

Recently I heard about an American company from Massachusetts called A123Systems. The reports were that they had developed, and were already marketing, millions of revolutionary batteries that were far more powerful, smaller, safer and longer lasting than anything else on the market. The batteries were being bundled in a module that fit in the spare tire well of most pre-existing hybrids, increasing the on board electric storage by many multiples, and cutting gasoline consumption by 80% and emissions by 60%.

Now, I'm not a MENSA member, but I play smart guys on TV. So I wanted to know more. I heard their battery technology had been chosen by GM and others for their plug-in hybrids due out in 3 to 5 years. I read the independent assessments done last summer by the Department of Energy's premier Argonne National Lab in Chicago. Using a standard Prius with the plug-in conversion module, their urban test protocols resulted in 150 to 225 MPG.

I then checked with people who had direct experiences using these cars and they confirmed that these results were sustainable, reliable and most importantly, the cost was not prohibitive.

A $22,000 Prius (or other hybrid like the Escape) and a module initially costing around $6,500 to $9,500 (depending on how far you commute) puts you into the car of tomorrow using much less high priced gasoline for around $30,000. And while that is still a lot of money for the average American family, it is a whole lot more accessible to more people than a promise or a potential or a dream – particularly with a modest transition tax credit to stimulate early use, increasing sales and falling prices.

I found this new information to be amazing and exciting. And with this education, I decided to stop observing our energy stalemate from the sidelines and come before you today to ask:

> ***Why not exercise your leadership right now to put in place a wartime – like mobilization plan to find out if this new 150 MPG technology, running successfully on streets around the country today, can cut our oil consumption by 80% starting now?***

The patriotic and smart American consumer is looking to Washington for the kind of leadership and action that can answer this question quickly.

Certainly the Congress should be able to provide the same kind of early user tax credits for these plug-in modules that were so critical to bringing down prices and jump starting the current growth in demand for standard hybrids. And by requiring the technology to pass the appropriate safety and environmental testing for the consumer to qualify for any tax credit, the concerns of any reasonable skeptic also would be met.

Obviously, game changing advances are sometimes met with indifference or even resistance from the Establishment. But that said, can't our powerful Detroit automotive industry be given the message, together with effective incentives, to speed up their conversion to plug-in hybrids using this or any other technological advance?

In the West Wing, someone once asked my character Sam Seaborn why he was not practicing law at some big Firm; why he was grinding it out for much less pay in a life devoted to public policy. And he answered with this story:

> " In 1940 our Armed Forces weren't among the twelve most favorable in the world. But obviously we were going to fight a big war and Roosevelt said the United States would produce 50,000 planes in the next four years. Everybody said it was a joke and it was because it turned out we produced 100,000 planes. Gave the Air Force an armada that would block the sun."

That is the spirit we need here. And let's face it: going from gasoline powered cars to plug-in hybrids should be easier than it was to retro-fit the entire auto industry to create those 100,000 airplanes.

I can't yet be certain, but wouldn't it be great if an American company has invented the breakthrough technology that can restore American leadership in the new frontier of transportation? If the use of my public profile here today helps spread the news of that possibility, then it will have been a day well spent.

I am so excited by the potential of this technology, that I have asked for one of the preproduction prototypes to show off in California, where the visionary leadership there is already exploring parallel incentives. I will fit right in, since California already has the largest number of hybrids on the road.

So, in the end, the choice before this nation and its Congressional leadership is simple: waiting years for any viable, mass-marketed plug-ins under the status quo of slower moving automotive bureaucracies **or** a major push now to jump start the conversion of plug-ins from the growing millions of hybrids coming on to our roads.

You know, the name of this Committee says it all: Energy Independence and Global Warming. If you choose to support this new American technology, you could be addressing both issues at once with the quickest and most practical action possible. With

what is at stake in the world today, it is not that much to ask. Unfortunately, we have done far more in the pursuit of much less.

And yet, when inspired our government is capable of great things. As I once said on the West Wing:

> "Over the past half century we've split the atom. We've spliced the gene and we've roamed Tranquility Base. We've reached for the stars and never have we been closer to having them within our grasp. New science, new technology is making the difference between life and death and so we need a national commitment equal to this unparalleled moment of possibility"

That was fiction. But we are here today to deal with reality. The stars are aligned, the time is now, and patriotic and smart Americans await this Congress' successful efforts.

Thank you for your time and your service to our country.

The CHAIRMAN. Thank you, Mr. Lowe, very much.

Our next witness is Frank Gaffney. He is the founder and President of the Center for Security Policy and a leading thinker on the national security implications of our energy dependence. He was the Deputy Assistant Secretary of Defense for Nuclear Forces and Arms Control Policy and Assistant Secretary of Defense for International Security Policy under President Reagan.

Mr. Gaffney, welcome. Whenever you are ready, please begin.

STATEMENT OF FRANK J. GAFFNEY, JR., PRESIDENT AND CEO, CENTER FOR SECURITY POLICY

Mr. GAFFNEY. Mr. Chairman, thank you. I want to pick up on what, I guess it is Senator Lowe, said about the national security implications of the plug-in hybrid option.

About 2 years ago, almost to the day, I had a chance to testify before this body's Armed Services Committee about what was then pending as a significant public policy problem, which was Communist China's attempt to buy a major American oil company, Unocal. And I testified at length, and if my full testimony would be part of the record I would be grateful, but the key point of it was I believe that China has appreciated a lesson that I am not sure we have internalized as well as we should, which is that energy insecurity can translate into tremendous national security problems. Indeed, I think it was a catalyst for World War II when the imperial Japanese feared that they were not going to have access to the energy needs that they believed they needed because of growing competition or perhaps a determination by the West to deny them access in the western Pacific.

I said at the time that unless the sorts of steps that I and others of my colleagues who have joined an organization called the Set America Free Coalition, unless such steps are adopted, it would appear as a practical matter we will inevitably find ourselves on a collision course with Communist China, particularly if worldwide demand for oil approaches anything like the projected 60 percent growth over the next 2 decades.

In my testimony I go on to enumerate a variety of other potential national security threats arising from our energy insecurity. As you know, Mr. Chairman, something on the order of three-quarters of the world's proven oil reserves are in the hands of adherents to an ideology I think is best described as Islamofascism. We and our allies are, as Mr. Lowe mentioned, as a result transferring enormous wealth in the form of payments for imported petroleum to people who are trying to kill us.

Not least, our putative friend, so-called moderate regime, Saudi Arabia, is using such funds to promote a pincer movement against the West involving Wahhabi recruitment and indoctrination via Saudi-funded mosques, madrassas, political influence operations, prison and military chaplain programs and campus organizations on the one hand and Muslim Brotherhood front organizations on the other.

Our enabling of so much behavior is the height of folly, an irresponsible and certainly unsustainable practice from the national security perspective.

Moreover, various suppliers of oil over the years have recognized that the threat of supply constrictions can translate into a weapon against the United States and other oil consuming nations. In my testimony I enumerate half a dozen of them.

We have not seen another oil embargo of the kind of 1973–74 fame, but that is not because any of the governments capable of trying to mount such an embargo have eschewed it as an immoral act or something they would be opposed to in principle. It is simply that it doesn't serve their interest at the moment. That could change at any time, especially if the world becomes more dependent on OPEC oil.

Terrorists appear to understand as well the dependency of our economy on imported oil and the ease with which interruptions of the supply can be affected through attacks not here, but on the infrastructure elsewhere.

In fact had the Abqaiq processing facility in Saudi Arabia not narrowly avoided a devastating attack, we would be even now in the midst of a full blown energy crisis as a result of that facility being off-line for some time.

What is to be done? I mentioned the Set America Free Coalition. One of the chairmen, Gal Luft, is here. I thank him for his work, among other things, in the field of educating people about the hybrid option, but also, if I may just mention, the importance of diversifying our energy uses particular in the transportation sector in other ways as well.

In the Set America Free blueprint we talk about ethanol not just from corn but from other sources, methanol not just from coal but from other sources as well, all of which can be part of an alternative fuel approach, fuel choice, if you will, if enabled by flexible fuel vehicles one of your colleagues spoke of driving today. There are about 5 million of them on the road. I cannot for the life of me understand why we allow any cars sold in America today to be other than flexible fuel vehicle vehicles. It costs about $100 to make them when you are doing them en masse, and with very few exceptions every one of them would benefit and you instantaneously create the opportunity for diversifying the fuel that powers our transportation sector.

Let me turn in closing to the matter at hand. There are others on the panel who are more capable of talking about the technology. I would suggest to you, Mr. Chairman, that the kinds of steps that you and your colleagues are now taking constitute a veritable tsunami behind the idea of bringing to market not in 10 to 15 years, but today, a technology that may not be perfect today but could rapidly begin to address the problem that we are facing, the insecurity arising from our dependency, particularly in our transportation sector, from the consumption of inordinate amounts, very inefficiently, of oil, most of which comes from people who are trying to kill us.

I began with a threat from China, let me close with one. It is my understanding that we may well see coming to Wal-marts near you the Chery, a vehicle Communist China proposes to sell for perhaps as little as 7,000, maybe $10,000, perhaps for as little as 12,000 to 13,000 thanks to their dominant position, with all due respect, in the battery technology business. You may be able to see American

consumers offered vehicles that could get with a flexible fuel vehicle feature perhaps 500 miles per gallon of gasoline from a Chery that is a flexible fuel and plug-in hybrid electric vehicle.

I dare say that will be the end of Detroit if that vehicle is available in large numbers in America in the near future, and it could be. I share my colleagues' view that we mustn't let that happen from a national security or an economic point of view. I call on you to redouble the efforts you are making to ensure that it is not.

Thank you, sir.

[The statement of Mr. Gaffney follows:]

SUBMITTED TESTIMONY OF

FRANK J. GAFFNEY, JR.
President and C.E.O.
Center for Security Policy

A 'NO-BRAINER': THE NATIONAL SECURITY CASE FOR PLUG-IN HYBRID ELECTRIC VEHICLES

HOUSE SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING

12 July 2007

Mr. Chairman, thank you for affording me an opportunity to address the national security arguments for encouraging the earliest and widest possible utilization of plug-in hybrid electric vehicles (PHEVs).

Energy: The *Sine Qua Non* of 21st Century Economic and Military Power

Two years ago, nearly to the day, I testified before the House Armed Services Committee in opposition to the then-pending purchase of an American energy concern, Unocal, by the Chinese National Overseas Oil Company (CNOOC). I told your colleagues, among other things:

> At the risk of stating the obvious, no nation can afford its people the quality of life, let alone the economic and security benefits, associated with being an advanced 21st Century society without assured and cost-effective access to energy. Today, for the United States and most of the rest of the world – including, increasingly, Communist China – that means having access to reliable sources of imported oil....
>
> China is mindful of the lessons of the 20th Century with respect to energy insecurity. Imperial Japan's thirst for imported oil was a principal catalyst for its war with the United States. For the moment, the PRC is neither able nor willing to emulate the violent seizure by Japan some sixty-four years ago of petroleum and other natural resources in East Asia. We ignore at our peril, however, the fact that Beijing is engaged in an even-more-ambitious effort to acquire legal title to energy resources, not only in the Western Pacific – where much of Unocal's reserves of 650 million barrels of oil are to be found – but literally *around the world.*
>
> What is particularly worrisome is that Chinese deals being struck from Siberia to Venezuela, from Indonesia to Sudan, from Iran to Canada, from Azerbaijan to Cuba appear not only designed to secure oil to meet Chinese needs. In a world in which such resources are certainly finite, and possibly contracting, they also have the

effect of taking them off a global market upon which the United States is increasingly dependent.

Jim Woolsey, Robert McFarlane and a number of other national security-minded individuals and organizations have joined the Center for Security Policy in advancing a plan for energy security we call the "Set America Free" blueprint. (The blueprint can be viewed at www.SetAmericaFree.org.) It offers practical steps that can be taken immediately to begin reducing the Nation's need for imported oil.

Unless such steps are taken, it would appear that, as a practical matter, we will inevitably find ourselves on a collision course with Communist China, particularly if world-wide demand for oil approaches anything like the projected 60% growth over the next two decades....

Other Energy-related National Security Threats

The possibility of a conflict with China over access to energy resources is but one of the compelling national security reasons to reduce our consumption of oil. Others include the following:

- About three-quarters of the world's proven oil reserves are in the hands of adherents to an ideology best described as Islamofascism. We are and our allies are, as a result, transferring enormous wealth in the form payments for imported petroleum to people who are trying to kill us.

  Not least, our putative friend, the "moderate" regime of Saudi Arabia is using such funds to promote a pincer movement against the West, involving Wahhabi recruitment and indoctrination via Saudi-funded mosques, madrassas, political influence operations, prison and military chaplain programs and campus organizations on the one hand and Muslim Brotherhood fronts on the other. As Under Secretary of the Treasury Stuart Levey told Congress in July 2005, "Wealthy Saudi financiers and charities have funded terrorist organizations and causes that support terrorism and the ideology that fuels the terrorists' agenda. Even today, we believe that Saudi donors may still be a significant source of terrorist financing, including for the insurgency in Iraq."

  Our enabling of such behavior is the height of folly, an irresponsible and certainly unsustainable practice from a national security perspective.

- Various suppliers of oil have increasingly utilized the threat of supply constriction as a weapon against the United States and other oil-consuming nations. To cite but a few examples:

  - In October 2002, member countries of the Organization of the Islamic Conference entertained the idea of an oil embargo to stop the United States from attacking Iraq. Mahathir Mohamad, the Malaysian prime minister at the time, said: "Oil is the only

thing Muslim nations have which is needed by the rest of the world. If they can cut back on supply, people will not be oppressive on them....It can be used as a weapon to protect the interest of Muslims."

- In April 2002, Saddam Hussein declared an oil embargo for thirty days in response to Israeli military operations in the West Bank. Libya immediately announced that it would follow suit if other Muslim oil-producers imposed an oil embargo. Iran's supreme leader Ayatollah Ali Khamenei stepped up to the plate reminding his OPEC colleagues that if the West did not receive oil, "their factories would grind to a halt. This will shake the world!" A day later, similar sounds came from Saudi Arabia, holder of a quarter of the world's oil reserves.

- Palestinian leaders have also urged their Arab brothers to show more muscle and use the power endowed to them by Mother Nature (i.e., curbing or cutting-off oil supplies).

- Iranian officials warned that the oil weapon would be used should the U.S. use force against Iran. Similar threats have come from Venezuela's Hugo Chavez. And

- Russia has repeatedly used threatened or actual reductions in energy exports to coerce its neighbors and other customers into toeing Moscow's line. Just this week, the Kremlin doubled the price of natural gas supplied to Georgia.

- If another oil embargo is not in the cards today that is only because of its current, questionable utility for OPEC's members who need oil revenues to sustain their growing populations – not because they perceive the strangulation of America's economy to be immoral or impossible to effect. This calculus could easily change as the world becomes ever-more-dependent on OPEC.

- Terrorists appear to understand the dependency of our economy and those of other Western powers on imported oil. They have also demonstrated an appreciation of the fact that it is possible to cause devastating interruptions in the flow of that vital commodity by striking at local extraction, processing and/or offloading infrastructures – without having to undertake the more challenging and risky task of attacking energy-related facilities here. Had, for example, the narrowly averted attack against the Abqaiq processing facility in Saudi Arabia succeeded, we would today be in the midst of a full-blown energy crisis, with severe implications for the world's economy and our own.

What is to be Done: 'Fuel Choice'

The only effective way to reduce America's vulnerability to one or more of these strategically ominous prospects is to take steps that have the effect of systematically diminishing the role of oil in international politics.

Let me be clear: The world will need oil for the foreseeable future. **What is required from a security perspective, however, is to shift oil from being a *strategic* commodity to being just another commodity.** In order to do that, *oil must become interchangeable with other energy sources.*

Recognizing, however, that *two-thirds of U.S. oil consumption is by our transportation sector*, the Set America Free Coalition – which I am proud to represent at this hearing – has focused its efforts on promoting *fuel choice* for that critical part of our economy. I would like to thank the Co-Chairs of the Set America Free Coalition, Anne Korin and Gal Luft, for all their hard work and their considerable contributions to this testimony.

The Coalition's Blueprint calls for a variety of initiatives that would increase the availability of both alternative fuels and the vehicles and infrastructure that can utilize them. We support the expanded use of ethanol (derived not just from corn, but from sugar cane and other cellulosic feedstocks) and methanol (from coal as well as other sources). I am of the view that every car sold in America from now on should be required to have **Flexible Fuel Vehicle** (FFV) capability – that is, to be able to burn either ethanol, methanol or gasoline (or some combination thereof). This could dramatically increase the miles per gallon *of gasoline* (the relevant measure if we are concerned with reducing oil consumption) performance of such cars.

An Electrifying Prospect

Arguably, the most attractive of alternative fuels however, is electricity. Since only 2% of our electrical grid relies on oil to generate power, electrification of the transportation sector is a key element of the effort to reduce our consumption of oil. Automobiles and other vehicles that can use electricity to provide some or all of their fuel can make a real contribution to weaning us from our oil addiction and diminishing the national security vulnerabilities that arise therefrom.

For these reasons, the Set America Free Coalition has been active in encouraging initiatives on a broad front to realize the potential of plug-in hybrid electric and other electric vehicles. It has been very gratifying to see a-building in recent days in both the House and Senate a veritable *tsunami* of legislation that reflects these ideas, including: tax credits, loans and other incentives for federal, state and local government agencies to become early-adopters of PHEV technology; programs to foster electrification of vehicles used in seaports, airports and other transportation hubs; loan guarantees and plant conversion grants for battery manufacturers; and funding for PHEV-related research and development, demonstration and education programs.

I will leave it to my colleagues on this panel who are far better equipped to discuss the state of plug-in hybrid electric vehicle technology and the prospects for its introduction on a large scale – especially if some or all of the aforementioned initiatives are enacted. Suffice it to say, I am inspired by their efforts and believe we should do all we can to ensure their success.

Mr. Chairman, let me end where I began, with a threat from the Peoples Republic of China. It appears that Communist China will shortly be introducing to the U.S. and other export markets the Chery – a car that could sell for as little as $10,000. Some believe the Chinese intend to translate their competitive advantage in battery technology to offer a plug-in hybrid electric variant of their vehicle at a price to consumers of $13,000-$15,000.

If such cars are also Flexible Fuel Vehicle-capable, they could get as many as *500 miles* per gallon of gasoline. With the price of gas at today's levels – let alone the *higher* prices that would be associated with one or more of the threats I have described above, it is hard to imagine that the U.S. automobile industry will remain in business for very long, with potentially far-reaching implications for our economy, society and security, *unless* Detroit is able to offer its own, competitive PHEVs.

Mr. Chairman, I thank the Select Committee and your colleagues elsewhere in the Congress for the appreciation you are showing for the contribution plug-in hybrid electric vehicles can make to the security and the economy of the United States. I encourage you to redouble your efforts on behalf of all those who stand to benefit from this important technology.

Frank J. Gaffney, Jr. formerly acted as the Assistant Secretary of Defense for International Security Policy in the Reagan Administration. He is currently President of the Center for Security Policy and a founding member of the Set America Free Coalition.

The CHAIRMAN. Thank you, Mr. Gaffney, very much.

Our final witness, Fred Hoover, has graciously agreed to join us on very short notice after Mayor Wynn was left stranded at the Austin airport last night because of severe thunderstorms.

Mr. Hoover represents the City of Austin, which has risen to a position of national leadership on energy and climate issues. The Austin Climate Protection Plan will eliminate greenhouse gas emissions from virtually all municipal activities by 2020 while dramatically enhancing the use of renewable power at Austin Energy, a utility which it works closely with developing a plan for a plug-in hybrid fleet.

Mr. Hoover, we welcome you. Whenever you are ready, please begin.

STATEMENT OF FRED HOOVER, AUSTIN CITY COUNCIL

Mr. HOOVER. Thank you, Mr. Chairman, and members of the committee for the opportunity to speak to you about the potential impact of plug-in hybrid vehicles on both the Nation's energy usage and global warming.

The City of Austin has an exceptional asset in its municipal utility, Austin Energy. The Green Choice program has led the Nation in renewable energy sales for the past 5 years. The energy efficiency and greenbuilding programs for commercial and residential buildings is a national model.

Austin Energy is the first electric utility outside of California to join the California Climate Action Registry.

Earlier this year the Austin City Council adopted a climate protection plan that sets goals and strategies to make Austin the leading U.S. City in the campaign to fight global warming. Plug-in hybrids I believe are part of that future.

The city's interest to plug-in hybrid vehicles took hold as they realized the potential environmental and economic benefits that come with electrifying the transportation system. These are reducing foreign oil with domestic resources for energy independence, reducing greenhouse gas emissions from vehicles, powering vehicles with renewable energy, reducing air pollution in urban areas and lowering fuel costs for consumers.

The benefits that can be realized from plug-in hybrids aren't some futuristic idea, as you have heard earlier today; the vehicle technology and the electric infrastructure fuel these vehicles is here today.

In January of 2006, the City of Austin launched Plug-In Partners national campaign to persuade automakers to build plug-in hybrids by demonstrating that a market for these vehicles exists today. Austin Energy has taken a lead in forming this national grassroots coalition, which now counts 600 partners, including 23 of the Nation's largest cities.

Our city partners include Los Angeles, New York City, Chicago, Boston, Portland, Oregon, Seattle, San Francisco, Kansas City, Missouri, Milwaukee, Phoenix and Memphis. This coalition spreads over 41 States and includes State and local governments, electric utilities, environmental and national security groups, and the business community, including the largest auto retailer, who joined because their CEO believes they can sell plug-in hybrid vehicles.

The automakers have taken notice. GM announced plans for two plug-in vehicles, the Saturn Vue and Chevy Volt. Toyota and Nissan are working on plug-in hybrids. Ford announced an intention to sell plug-in hybrids in the next 5 to 10 years.

Plug-in hybrids have the ability to enhance energy independence in the near term at virtually no cost. Our national power system could charge tens of millions of plug-in vehicles without requiring new power plants. Consumer demand for electricity peaks during the day, but more than 40 percent of the capacity of generators in the United States sits idle or operates at reduced load overnight. It is during the off peak hours that most plug-in vehicles would be charged. The Department of Energy's national lab reported that the Nation's existing electric generating capacity could be able to fuel 84 percent of the U.S. cars, pickups and SUVs and plug-in hybrids without a single power plant being built.

Earlier this year the Brookings Institution announced that nothing could do more to reduce oil dependence more quickly than making cars to connect to the electric grid. Electric utilities could be the gas station of the future, with the infrastructure already in place and the significant unused generating capacity to recharge cars overnight. The only thing plug-in hybrid vehicle owners would need is an extension cord.

Plug-in hybrids offer the most promising approach to reducing carbon emissions and transportation. A California Air Resources Board study of emissions along the entire supply chain found that using today's national electric grid, a battery-powered electric vehicle generates 40 percent of the greenhouse gases produced by an equivalent gasoline vehicle. This would shift the emissions that impact the public health from urban areas out to power plants where they are more easily controlled.

As the Nation's grid becomes greener, so would the transportation sector. Austin Energy produces a lot of wind generated energy mostly at night, which provides a perfect fit from environmentally friendly plug-ins. The Green Choice customers of Austin Energy would fuel plug-ins from wind from west Texas instead of oil from the Middle East. The environmental benefits of hybrids will be substantially increased as you enact Federal policies encouraging the greening of the energy grid.

As U.S. energy prices currently run about $3 a gallon for gasoline and the national cost of electricity at 8.5 cents per kilowatt, a plug-in hybrid runs on the equivalent of .75 per gallon of gasoline. Given that half the cars are driven 30 miles or less, a plug-in with even a 20-mile purely electric range could reduce petroleum fuel consumption by 60 percent.

In summing up, Austin Energy is going to put its money into this effort. It has committed $1 million in rebates to customers who purchase plug-in hybrids when they become available. The consumer tax credits offered in the House renewable energy bill coupled with these rebates will help put plug-ins on the road and start us to the road to energy independence.

Thank you.

[The statement of Mr. Wynn follows:]

City of Austin

Testimony of Mayor Will Wynn

Select Committee on Energy Independence & Global Warming
United States House of Representatives
July 12, 2007

Mr. Chairman and members of the committee, I'm honored to be here this morning to speak to you about the potential impact of plug-in hybrid vehicles on both the nation's energy usage and global warming.

Our city has an exceptional asset in our municipally-owned utility, Austin Energy. Our Green Choice program has led the nation in renewable energy sales for the past five years. Our energy efficiency and greenbuilding programs for commercial and residential buildings are national models. Austin Energy is also the first electric utility outside California to join the California Climate Action Registry.

Earlier this year, the Austin City Council adopted a climate protection plan that sets goals and strategies to make Austin the leading U.S. city in the campaign to fight global warming. Plug-in hybrids are part of that future.

The city's interest in plug-in hybrid vehicles took hold as we realized the potential environmental and economic benefits that come with electrifying the transportation system:

- replacing foreign oil with domestic resources for energy independence
- reducing greenhouse gas emissions from vehicles
- powering vehicles with renewable energy

The City of Austin is committed to compliance with the Americans with Disabilities Act.
Reasonable modifications and equal access to communications will be provided upon request.

- reducing air pollution in urban areas and
- lowering fuel costs for consumers

The benefits that could be realized from plug-in hybrids aren't some futuristic ideal – the vehicle technology and the electric infrastructure to fuel these vehicles are here today.

In January 2006, the City of Austin launched the Plug-In Partners national campaign to persuade automakers to build PHEVs by demonstrating that a market for the vehicles exists today. Austin Energy has taken the lead in forming this national grassroots coalition, which now counts nearly 600 partners, including 23 of the nation's largest cities.

Our city partners include Los Angeles, New York City, Chicago, Boston, Portland, Seattle, San Francisco, Kansas City Missouri, Milwaukee, Phoenix and Memphis. The coalition spreads over 41 states and includes local and state governments, electric utilities, environmental and national security groups, and the business community -- including the largest auto retailer, who joined because their CEO believes they can sell plug-in hybrids.

The automakers have taken notice: GM has announced plans for two plug-in vehicles, the Saturn VUE and the Chevy Volt, and Toyota and Nissan have both announced they are working on plug-in hybrids. Earlier this week Ford said it expects to sell plug-in hybrids in five years.

Plug-in hybrids have the ability to enhance energy independence in the near term at virtually no cost. Our national power system could charge tens of millions of plug-in hybrid vehicles without requiring new plants. Consumer demand for electricity peaks during the day, but more than 40% of the generating capacity in

the United States sits idle or operates at reduced load overnight. It is during these off-peak hours that most plug-in vehicles would be charged.

The Department of Energy's Pacific Northwest National Laboratory reported that the nation's existing electric generation capacity would be able to fuel 84 percent of U.S. cars, pick-ups and SUVs as plug-in hybrids without a single new power plant being built. This same report found that plug-in hybrids could displace 6.5 million barrels of oil per day, representing 52% of U.S. oil imports, and that greenhouse emissions from vehicles could be reduced by 27 percent.

Earlier this year, the Brookings Institute announced that nothing could do more to reduce oil dependence more quickly than making cars that could connect to the electric grid. Electric utilities could become the gas stations of the future – with the infrastructure already in place and significant unused generating capacity to recharge cars overnight. The only thing plug-in vehicle owners would need is an extension cord.

Plug-in hybrids vehicles offer the most promising approach to reducing carbon emissions in transportation. A California Air Resources Board study of emissions along the entire supply chain found that using today's national grid, a battery-powered electric vehicle generates only 40% of the greenhouse gases produced by an equivalent gasoline vehicle. They would also shift emissions that impact public health from urban areas out to the power plants, where they are more easily controlled.

As the nation's grid becomes greener, so would the transportation sector. Austin Energy produces a lot of wind-generated energy, mostly at night, which provides a perfect fit for environmentally friendly plug-ins. Our Green Choice customers would be fueling their plug-ins with wind from West Texas instead of oil from the Middle East. The environmental benefits of plug in hybrids will be substantially

increased as you enact new federal policies encouraging the greening of the nation's energy grid.

At current U.S. energy prices – that is, with the cost of gasoline at $3 per gallon and the national average cost of electricity at 8.5¢ per kilowatt hour – a PHEV runs on an equivalent of 75¢ per gallon. And given that half the cars on U.S. roads are driven 30 miles a day or less, a plug-in with even a 20-mile purely electric range could reduce petroleum fuel consumption by about 60%.

In the future when plug-in hybrid vehicles are common, they could also be used to store electricity, thereby eliminating the need for additional peaking power plants. This developing technology, known as vehicle-to-grid (or V2G), will allow electric utilities to draw power during peak hours from plug-in vehicles charged at night when generating capacity is idle. A "smart grid" is essential for this technology.

National legislation that provides tax incentives and funds research is key to making plug-in hybrids a reality. We support the plug-in hybrid provisions in the Energy Bill adopted by the House Committee on Energy and Commerce in June. Demonstration programs for plug-ins are essential to develop these vehicles, as are grant and loan programs for advanced battery research and smart grid deployment.

Austin Energy has committed $1 million for rebates to customers who purchase plug-in hybrids when they become available. The consumer tax credits for plug-in vehicles authored by Congressman Lloyd Doggett of Austin in the House renewable energy tax bill, coupled with our rebates, will help put plug-ins on the road. This is the road to energy independence and a cleaner future.

The CHAIRMAN. Thank you very much, Mr. Hoover. We thank each of you for your opening statements and will now turn to questions from the committee members, and the Chair will recognize himself for an opening round of questions.

Mr. Lowe, you are one of the very few people who have ever driven a plug-in hybrid. I think people are wondering what is it like. Is it much different than driving a regular car?

Mr. LOWE. Well, the most marked thing that I found is you get almost competitive with yourself to see exactly how much amazing gas mileage you can be. You watch this sort of read out and you realize okay, I am going to come off of this stoplight a little slower because I will get literally 100, 225 miles per gallon. I find it makes you a more economical driver.

With that said, you can't imagine the attention you get from people because the one that I have been driving says 150 miles per gallon on the side. So people come up to you and stop you on the street and want to know where can I buy it. I mean my nonscientific field testing tells me there is a huge interest in this car.

The CHAIRMAN. And so people want to know, Mr. Vieau, Mr. Gaffney, is this a commercially viable idea or is this just some dream that people have? Can this happen? Can we actually produce vehicles like this that the American people can purchase?

Mr. VIEAU. There is absolutely no question that we can do it. We made dozens of the demonstrations vehicles to show that the technology can be implemented and we are going into the third generation design, and we are a couple of steps between now and the broad scale release of the product. One is NHTSA testing and EPA testing. We know the engineering activities associated with that, but these are problems that have been solved in numerous ways.

I can tell you that we as an industry figured out ways to package gasoline and it is much more volatile than what we have in our battery systems. So there is work to be done, there will be no question about it. The big issue is finding ways to assure the volumes will be there. We can build the capability to do it. The volumes will drive costs down.

The CHAIRMAN. Do you agree, Mr. Gaffney, with Mr. Lowe that the volumes will be needed because the public will move to technologies like this and it will become a commercially viable business?

Mr. GAFFNEY. I am not sure I have the expertise to address that other than to say I don't know of anybody who wouldn't rather get 150 miles a gallon than 17, 20, even 30. There may be people who prefer to expend the money associated with it as the price keeps going up, but I can't imagine it.

The question about is this going to be the future, no less an authority than Lee Iacocca has said this is the future of the industry. I am told that I think it is CalCars started by discovering one of their engineers found a switch in his Toyota Prius that was inoperative. When he reverse engineered it, he figured out it was for a plug-in hybrid feature that simply had not been built into the car, this particular model.

The reason I mention that is I don't know if that is a story or true, but the point is Toyota has stolen the march in Detroit with the Prius and perhaps with your Camry, but what is most impor-

tant, it seems to me, is if their principal reason for not introducing as quickly as they can a plug-in feature is that it didn't jive with their marketing plan, which as you know has been built around the motif that you don't have to plug it in as a way of distinguishing the hybrid they are making now from the General Motors electric car which some people were frustrated about did not have sufficient mileage.

We should not be hung up on the basis of some particular foreign manufacturer's marketing campaign, and I believe this is a wake-up call for Detroit. If indeed there will be a Detroit in the future, it should be based on the idea that they need to get in front of these kinds of technologies using American know-how and wherewithal wherever possible.

The CHAIRMAN. Okay. For you, Mr. Hoover, Austin is committed to making this a commercially viable option for the residents of Austin?

Mr. HOOVER. Right. When Roger Duncan from Austin Energy first started coming to Washington to talk about this idea in late 2004–2005, the response of the automakers were that, well, this was something that was kind of far in the future, over the horizon; the technology was not there because of the batteries. In that time frame we have seen, because of the support here on Capitol Hill and by the other groups in Washington, D.C., that the automakers have steadily accelerated that timetable as to when these cars are to become available, and now you have GM and Ford discussing these cars as being real production vehicles that they will see in the near-term future.

The CHAIRMAN. Thank you. My time has expired.

I recognize the gentleman from Wisconsin, Mr. Sensenbrenner.

Mr. SENSENBRENNER. Thank you very much, Mr. Chairman.

I think all of us are sold on the concept that a plug-in hybrid is really the car of the future. Where we have the disconnect, in my opinion, is the fact the battery technology is not keeping up with our hopes. So I have a few questions of you, Mr. Vieau, since you seem to know more about battery technology of everybody in the room.

Where are your batteries manufactured?

Mr. VIEAU. China.

Mr. SENSENBRENNER. Okay. Is there not an American battery of comparable capability available?

Mr. VIEAU. Well, I want to qualify the first comment—excuse me—that I just made.

As to the actual cells such as like I have in my hand, we are having them produced in China, and we have multiple factories that are involved in that process. The systems, themselves, that you would see in this car that is out here, which is a combination of batteries with a lot of other gear and packaging and so forth, is made in America. So about half of what you see overall is American content, and about half of it is Chinese. There are no significant commercial North American lithium ion battery manufacturing facilities today.

Mr. SENSENBRENNER. And why would that be?

Mr. VIEAU. The commercialization of lithium ion technology was initiated by Sony Corporation in Japan in 1991, and the Japanese

put a significant investment in the development of lithium ion technology at a time when our major battery companies turned in a different direction. I believe by the time that our companies came back they felt that it was a bit of "game over." Our approach to this has been coming outside the box with new chemistries and to reinvent the battery technology, and we have been able to change the game substantially.

I will say that it is not out of any personal desire to go build batteries anyplace outside the U.S. We made a decision that was somewhat defensive to the company's security, which is to make sure that we took advantage of the lowest cost available in materials and resources in the shortest possible period of time to secure a position of global competitiveness for our company. In the future and over time, we have the resources today and the availability to make choices that will allow us to include North American manufacturing in our plans for the future.

Mr. SENSENBRENNER. Well, if I were in your position, Mr. Vieau, I would have made the same decision, so I am not critical of this, but the concern that I think we have as policymakers is aren't we exchanging a dependence upon foreign sources of energy from the Middle East—a lot of the folks there do not like us—for foreign services of energy being made in China with lithium ion batteries.

What do you think Congress can do to be able to jump start the North American capability of manufacturing those components that you currently have to go to China to get?

Mr. VIEAU. I think there are three pieces of this puzzle in order to make sure that we are successful in this initiative today as a country.

One of them is the early-term incentives to create awareness and to drive demand and to increase volume. The second is to spend more money as a nation in the investment research to drive cost and to improve efficiency of the lithium ion systems that we have employed today. The third one is the creation of an independent pilot scale and at least a small, capable manufacturing scale to demonstrate American manufacturing competencies, and I believe that it would make a great deal of sense for us, as a people, to invest initially in those factories to get that up and running.

Mr. SENSENBRENNER. I agree with what you say. Now, I have been a veteran of the Science Committee for most of my 29 years in Congress, and early on I did an awful lot of overview of the nonnuclear energy research that the Department of Energy sponsors, and a lot of that includes battery research.

Can you give me your opinion of whether that research has actually helped American manufacturing in this capability or whether it has gone in the wrong place?

Mr. VIEAU. We have drawn on the resources of research activity around the country. Our people do that on a daily basis. The competency that we have as to the fundamental research capability in America, I believe, is second to none. Where we have failed in the battery industry is in the commercialization and execution, so that investment that has been made has provided some dividends. The technology that we are employing today is considered by the industry to be the leading technology for plug-in hybrid vehicles of the future.

Mr. SENSENBRENNER. Thank you, Mr. Chairman.

Mr. GAFFNEY. Mr. Chairman, could I just add one quick point on that?

I think you are absolutely right to be concerned about the industrial capabilities of this country in this technology. From a national security perspective as well as from an economic perspective, it is the height of folly for us to be depending on China or, for that matter, Japan or Korea, which are, I think, the other principal foci of these kinds of technologies at the moment. This is a place where we really need for both the Defense Department's applications—I have served on the Defense Science Board panel, looking into this, and I think there is keen interest in this whole question, and it really needs your support.

Thank you.

The CHAIRMAN. Great. The gentleman's time has expired.

The Chair recognizes the gentleman from Washington, Mr. Inslee.

Mr. INSLEE. Thank you.

First, I want to tell you how happy I am that you are here. Mr. Vieau eloquently used a metaphor involving our response to World War II, and I have suggested another metaphor, which is our Apollo project, and virtually everything you have all suggested is contained in the new Apollo Energy Act that I have introduced with some of my colleagues. I am glad you are telling your story, too. It is a very important one. I have tried to tell, Mr. Gaffney, Mr. Hoover, Mr. Vieau, all of your stories in a book coming out called Apollo's Fire. I have tried to tell your stories because they are good ones, and the more that people know them, the more they will embrace both of these technologies and the policies they need to drive them.

I believe we are in a technological race, as we were in the original space race, right now with the rest of the world to develop the technologies and to manufacture some here and maybe some overseas, but we need to keep these technologies homegrown, and I think that is the race we are in right now.

I want to express frustration that this is not moving faster. I met a guy, while writing this book, named Felix Kramer with a group called CalCars in California. They developed the first one of these to get them on the road to try to get Detroit and others to promote this, and I am still frustrated, frankly, that they are still talking 5 to 10 years to get these mass-produced. The Dreamliner that Alan Mulally built at Boeing took—I do not know—maybe 6 or 7 years from conception to roll-out. These things are on the road today; the batteries are manufactured today, and we are still talking 5 or 10 years for mass production.

What would you suggest is the most important thing we could do to accelerate that rate of getting them on the road? Anyone could help me on that.

Mr. HOOVER. Two suggestions, one that has already been discussed. Targeted funding for research on the batteries to help make sure that the commercialization happens sooner and then, secondly, incentives for consumers to buy plug-in hybrids.

As I mentioned, Austin Energy is willing to put its money up for those types of incentives, but I think the Federal incentive that

was done originally for hybrids was a big part of that. I formerly served in the Maryland State Government. We had a State incentive to encourage people to buy hybrids back when they first came into the market, and it had a lot to do with pushing that. So I think those types of things can be done immediately.

Mr. INSLEE. You will be pleased to know that I think both of those are going to be in our bill and that we have a tax incentive for consumers with an increasing amount per megawatt hour of capacity.

Also, I passed an amendment, with the help of others, last week to develop an R&D program to develop the software we need to use these batteries as part of the utility grid because now we have this tremendous ability to use batteries as a storage capacity for the utility grid. We had earlier testimony from another committee member who said it might have an economic value of $3,000 for owners to essentially rent their battery to the utility to store the utility electricity in their grid while you are asleep. That is a good way to make some money. We hope that will happen.

I want to focus and ask you all about the ability—I think, Mr. Hoover, you made reference to the fact that, even on today's grid, which is mostly coal-powered, a mostly dirty, CO2-emitting, coal-powered grid—even on today's dirty grid, we get CO2 savings relative to gasoline and other situations. My perception is, as that grid becomes cleaner, as we move to more renewable resources, including perhaps clean coal someday, I believe this technology can get cleaner over time. In other words, the car you buy today is actually going to get cleaner over time because you are going to be using cleaner electricity.

Is that a fair assessment?

Mr. HOOVER. I would agree with that. I mean our view has been—to put it in a simple way, it is much easier to control emissions from the generation side than from the tailpipe side. Previously, what we have tried to do with automobiles is to deal with what comes out of the tailpipe and to do things to that. If you change the mixture that the car runs on so as it is running on a cleaner fuel you are lowering emissions, and you are pushing the control of the emissions to one central place as opposed to thousands of tailpipes.

Mr. INSLEE. Okay. Thank you.

A quick question to Mr. Vieau as far as costs.

Costs are high now, relative. We are in a small manufacturing situation. They are obviously going to come down. We have these huge scales of economy.

Can you make any projections about costs, once we get to mass-scale production, for these vehicles relative to hybrid costs today? Also, as far as operating costs, I have heard numbers as low as 1 cent to 2 cents per mile; whereas, gasoline is at least 9 cents a mile to run your car.

Could you address both of those issues?

Mr. VIEAU. Certainly.

With respect to the initial costs today, we are projecting a sale price for the multi-year warranted conversion of an existing hybrid next year of less than $10,000. We expect that that will go down by about 40 percent over a 3- to 5-year period by increasing vol-

umes gradually over that time and by improvements in the technology that we have in our product pipeline.

As far as the operating costs are concerned on the vehicle, we are expecting an 80 percent reduction in the consumption of gasoline and in the associated costs. Now, one of the questions is the cost of the electricity that is used at night. In some areas of the country and in the world, smart metering is being implemented to take advantage of the lower costs of electricity in the evening as opposed to the daytime costs, and so in some areas where it is 10 cents to 12 cents per kilowatt hour in the day, the cost is now being provided for evening use of electricity in the 2- to 3-cent-per-kilowatt-hour range, the combination of which would make these systems even more cost-effective.

Mr. INSLEE. Thank you.

The CHAIRMAN. The gentleman's time has expired.

The Chair recognizes the gentlewoman from Michigan, Mrs. Miller.

Mrs. MILLER. Thank you very much, Mr. Chairman.

I think this entire hearing is fascinating. Certainly, the subject matter is something I have a great degree of interest in, my coming from Detroit—outside of Detroit, I should say—but really Michigan actually during World War II was known as the "arsenal of democracy" because we had the manufacturing capability that literally built the armaments that led the world to peace, and yet now Congress seems to be making a conscious decision to bankrupt Detroit, and I appreciate the fact that particularly—Mr. Gaffney, my principal committee assignment is sitting on the House Armed Services Committee, and I wanted that committee assignment because I believe that the first and foremost responsibility of the Federal Government is to provide for our national defense and to protect the homeland. Yet, when we think about what Congress is trying to do to achieve energy independence/energy security, which does equal national security—I absolutely do believe that—we have put Detroit in a bind because we expect them, the domestic auto industry, to compete internationally in building automobiles with countries like Japan, which you mentioned about Sony in making your investment.

Actually, the Japanese government has spent over $1.5 billion on lithium ion battery technology and doing the R&D. China, the government of China, is doing the same kinds of things. There are health care costs that the foreign automobile industry does not have to pay. Yet our industry obviously does have to pay them. GM has over 1 million retirees right now who we are paying health care costs on.

We want to be an active participant in getting to where we need to be as a country. Yet we are so focused on the antiquated modeling system of CAFE, which is crazy. It is nuts. That was actually initiated in the 1970s to get us off of the consumption of foreign fuel. Since that time our consumption of foreign fuel has increased by 100 percent. Now, I am not a mathematician, but it seems like that is not working.

Wouldn't it be better for us as the Federal Government to assist the domestic auto industry on R&D with lithium ion battery technology and all of these kinds of things? Because if we do not do so,

we are literally going to put the domestic auto industry out of business under the CAFE standards that just passed the Senate. Chrysler will go bankrupt because of the product mix. About 70 percent of their product line is SUVs and light trucks, et cetera. So we are going to bankrupt the domestic auto industry.

How does that—I guess this is my question. How does that advance our national security interest and our energy independence interest to bankrupt the domestic auto industry, thereby only allowing our consumers the availability of buying foreign cars?

Mr. VIEAU. I would like to make at least the first comment on this.

It is just that we need the domestic auto manufacturing capability now and in the future, and I believe that the cooperation of American technology being developed today by us and by others—by the way, there are a number of other companies working in the same field as aggressively as we are at this point in time, the combination of which can be very competitive on the global scale today, and I think that without that union of the two and without that available, our business is not going to be as successful in the long term. Our opportunity is in the cooperation with General Motors, Ford and DaimlerChrysler.

Mrs. MILLER. Yet—and I would like to hear your answers—Ford loses $3,200 on every Ford Focus that it sells, and they are selling these cars just to comply with these crazy CAFE standards. We will never be able to compete under this model.

Mr. GAFFNEY. I am very sensitive to the concerns you have expressed. Particularly, as I said earlier in response to Congressman Sensenbrenner, the industrial base of this country is a national security imperative. I think, in a previous appearance before your committee, I testified that one of the things that I think we have done a woefully inadequate job on is understanding how dependent we are becoming on foreign suppliers for even the military hardware of this country that may not be available to us in time of war, let alone these other industrial capabilities. The public is now suddenly aware of this in the context of the dependence that, all of a sudden, we realize we have on China for food and for other products that are perhaps unsafe. That is a microcosm of a larger problem. Let me give you just one example directly relevant to your constituents.

I was at the unveiling at the Washington auto show of the GM Volt. It is a very exciting concept car that they are very anxious to produce, they say. The reason given, in response to Congressman Inslee's question of why is it still 5 or 10 years away, is they say they cannot get batteries for that car.

Now, I am hopeful that the kinds of technologies that we are talking about here will help rectify that, but as long as we continue to rely on China or on Japan or on Korea or on somebody else to supply this stuff, we will always be at the mercy of guys who do not necessarily want the Volt to come on the market and to be an effective competitor with their future products.

Mrs. MILLER. Yet the domestic auto industry—actually, the auto industry is the only industry in America that has carbon constraints placed on it. We do not place carbon constraints on the oil and gas industry, on the electrical industry or what have you. Ap-

parently, Congress has made a conscious decision to do whatever they can to bankrupt the domestic auto industry.

Do you think this is the best way for energy independence?

Mr. GAFFNEY. I certainly do not. More to the point, I think if that industry goes away our dependence for other directly militarily relevant vehicles will also become a greater problem. So this is not purely a lunatic economic approach. It is also, I think, a national security problem.

Mr. VIEAU. I think that, from what I have seen of the American auto companies right now, they are beginning to embrace the electrification of vehicles, and the Chevy Volt is a great example of the technological change that can change this whole dynamic that you are talking about. Having a superior vehicle with superior technology, with advances—we had that Chevy Volt at our facility yesterday so all of our employees could drive it and take a look at it and experience it and be motivated by what it means.

The key point right now is that we need to start something today and to demonstrate these capabilities. There are pockets of reluctance and resistance around the industry and around the world saying a lot of this cannot be done. I think the key thing is we need to do some things, and the combination, too, is going to strengthen the automotive competitiveness.

Mrs. MILLER. Thank you, Mr. Chairman.

The CHAIRMAN. The gentlelady's time has expired.

The Chair recognizes the gentlewoman from South Dakota, Ms. Herseth Sandlin.

Ms. HERSETH SANDLIN. Thank you, Mr. Chairman.

I want to thank Mr. Cleaver for yielding his time to me at the outset to make a call at 11:30.

As I mentioned in my opening statement, I drive Flex Fuel Vehicles. I drive a Chevy Impala that can fill up with E85—an 85 percent blend of ethanol—and I drive a Jeep Liberty Common Rail diesel that can fill up with biodiesel.

Given what Mrs. Miller has been saying about the importance of our domestic auto manufacturing capacity, I think that Detroit has made a significant commitment in trying to find a competitive edge in light of a number of factors that she identified and that Flex Fuel Vehicle manufacturing has been where they have been in trying to find a niche in light of some of the difficulty of getting access to these batteries for their hybrid manufacturing. So I do not want to in any way undercut but, rather, to enhance what Detroit has already done and the direction that we hope to incent as it relates to plug-in hybrid technology.

I am wondering if any of you can address the issue of why we have not seen any manufacturing of the flex fuel gas-electric hybrids, let alone any flex fuel plug-in hybrids. Is it an infrastructure issue and the availability of fuels like E85, like biodiesel? Is it primarily the issue of the difficulty of getting the batteries to be able to integrate both technologies into one vehicle?

My understanding is that, perhaps down at Virginia Tech, they have been doing some research. They have got a car that is a hybrid Flex Fuel Vehicle, but are there any others on the road that you are aware of, and don't you agree that it makes sense—I think, Mr. Gaffney, you say in your testimony—to take the next sort of

step or to add the small step of ensuring that we can have vehicle engines that can run on any combination of liquid fuel and electricity? Beyond that, we have to ensure that the liquid fuel is anything from pure gasoline to pure ethanol to biodiesel and anything in between.

Perhaps, you might want to comment as well on vehicle engines as it relates to diesel fuel. We know that in Europe we have far more passenger vehicles that utilize the diesel engine technology. What are your thoughts on what we can do in this area?

Mr. GAFFNEY. May I respond?

One of the fuels that you mentioned—or failed to mention, I should say—is methanol, and I think the marginal additional cost in programming the chip to ensure that it can also consume methanol is negligible, so we ought to be making sure that that is a piece of the Flexible Fuel Vehicle equation.

As I said in my testimony, I cannot imagine why we are not making it an obligation of any car manufacturer—not just Detroit—but of any car manufacturer that wishes to sell cars in the United States. They have to have seatbelts for every passenger. That is a given. They have to have airbags for the front two passengers. That is a given. They ought to also have a Flexible Fuel Vehicle capability built into the car. It just immediately—whether there are supply problems right now or whether there are localized areas where you can get this particular alternative fuel or another over time, the fleet is transformed into one that has a requirement for a fraction of the gasoline. Now, you may want to use gasoline for other reasons, but you do not have to if you have got these other features built into it.

My hope is—you are absolutely right—that what we will do, as a result of what I call the "tsunami of legislation," is to create incentives, to create R&D programs, to create demonstration programs, to create education programs, but most especially, to facilitate production in this country so that you will have plug-in hybrid electric vehicles that have, yes, a Flexible Fuel Vehicle capability as well.

Mr. HOOVER. If I could offer a couple of thoughts on that, it seems that from our view the plug-in hybrid is part of the solution, but it is not the only solution, and our attitude is that we need to sort of diversify the way we fuel vehicles in order to have the purchasing ability for Americans to have a vehicle that fits their needs best.

Right now, we do that basically by size. You pick a car for your needs on that. What we need to do is to change the fueling infrastructure and to change the engine technology so that cars can run on a multiplicity of fuels. That way, consumers can pick that type of vehicle that best fits their needs. For an urban consumer who does a daily commute, a plug-in hybrid might be best. In other areas, it may be a Flex Fuel Vehicle that has other capabilities, but I think that is how we sort of get away from this problem we have of the overdependence on one fuel source.

Ms. HERSETH SANDLIN. Well, I thank you for your responses. Does anyone want to address the diesel engine technology issue?

Mr. Vieau, are there complications with utilizing the battery technology with a diesel engine?

Mr. VIEAU. No. No, not at all.

I think that the proposition that we have today for plug-in hybrid vehicles is a system that is in harmony with a Flex Fuel Vehicle by the very nature of it, and the electrification is a piece of the problem. I do not think anyone is suggesting, though, that we are ready technologically to make fully electric vehicles. It is probably in the category of where we looked at fuel cell vehicles a few years ago. There is a lot more time to get to the point where you have that.

The Chevy Volt and I think the GM platform suggests that the proper combination for the technology we have available today is a vehicle that runs on an electric motor with a series of batteries that power that. The batteries can be provided with energy from a number of flexible sources. One of those can be a generator that runs on biofuels, diesels and a number of different materials, and it can be plugged in as well from a local source. So having that combination of flexibility is really what the American people want. They want to have a vehicle that they can use extensively, that they can use efficiently and with less pollution.

Ms. HERSETH SANDLIN. Thank you.

Just one final comment, Mr. Chairman.

I agree with what Mr. Gaffney said in his response, that any requirement, any incentive but any, again, requirement that we will consider as it relates to Flex Fuel Vehicles has to be on any car sold in the United States. It cannot be simply targeted to Detroit, which has already made a significant commitment in this area. I think that, again, whether it is fuel choice or vehicle choice, it is important.

Then, of course, I appreciate what Austin is doing as it relates to the importance of smart grid metering, because we have a lot of wind in South Dakota just like you have a lot of wind in Texas, and I think that we have tremendous opportunity for storage capacity in electric vehicles.

Thank you, Mr. Chairman.

The CHAIRMAN. The gentlelady's time has expired.

The Chair recognizes the gentleman from Missouri, Mr. Cleaver.

Mr. CLEAVER. Thank you, Mr. Chairman.

Mr. Lowe—Senator. I am sorry—right now there is not a lot of discussion about the fact that ethanol is subsidized at about 51 cents a gallon, which is tremendous. There is a tremendous subsidy of $4.4 billion a year.

What do you think the Federal Government can do or should do that would encourage the manufacturers and the public to move significantly toward plug-in hybrids?

Mr. LOWE. Well, first of all, what you have to understand is that I am playing a presidential candidate, so I am loath to get into ethanol because I would like to win Iowa, but that said, I think part of what—certainly, my thrust here today is to raise awareness that we are even having this discussion, that for those who are still in the flat earth society that there is maybe not a problem with our environment, okay, let us take that off the table.

Certainly, you will agree that this is a national security issue. So there are two wonderful reasons to be having this debate, and when the public tunes into this, I think that they will be engaged,

and like I said in my testimony, I believe they do want to do their part.

One of my best friends has just recently converted his whole fleet to biodiesel. He loves it. I have been driving this plug-in hybrid. I have been able to drive some other prototypes. When Governor Schwarzenegger was sworn in, all of his official fleet at the swearing-in were prototypes from all over the world, and they were extraordinary.

So I think, in answer to your question, you have to lead the public into an area where they are ready to accept this and are ready to take action and, on a parallel track, you need to be working with Detroit and also making sure that the other foreign manufacturers have the same amount of—"impediments" is not the right word, but what is good for the goose needs to be good for the gander, I think, and so I think it is really a parallel track.

Mr. CLEAVER. I have a mobile office in Kansas City and, incidentally, Ford Motor Company has a plant there that produces the Escape hybrid, but my mobile unit runs on vegetable oil, which costs about 70 cents a gallon, and it is true that you sometimes smell like a Big Mac, but——

Mr. LOWE. How is that for your diet?

Mr. CLEAVER [continuing]. I agree with you.

I brought this up because I think there probably should be a—I mean we should use every available source of reducing our dependence on foreign oil, and I think we will be making a terrible mistake if we think that we can solve this problem simply by getting more plug-in hybrids or E85 or, you know, any other Flex Fuel Vehicles. There is a problem that I would like someone to address.

When we use flex fuels, the engines are not calibrated to operate optimally for any of them, and so the more we talk about flex fuels we are also talking about not putting cars on the road that are operating at their optimum.

Is that a concern that I should discard?

Mr. GAFFNEY. Well, what is the object of the exercise?

From my perspective, the object of the exercise is reducing the amount of oil that we rely upon to power our transportation fleet. If we have alternatives to oil that may be used less efficiently in some respects but that are indigenously available, that we are getting from products—and I would add to your ethanol question the obvious, immediate opportunities of sugarcane-based ethanol coming from sources other than dangerous Wahhabists and Islamafascists in the Middle East, for example, and in Latin America, also the possibility that we will shortly see cellulosic ethanol become a real contributor. These are, in other words, alternative sources of fuel that, you may be well right, are not as efficiently used or that we consume more of than we might consume of oil on a per mile basis, but yet if the object of the exercise is to stop transferring wealth to people who are trying to kill us, I think that is a good trade-off to be making. You are absolutely right. It is flexible fuel, and these alternative fuels are just one piece of a comprehensive approach that we call in the Set America Free Coalition "fuel choice."

Mr. CLEAVER. Thank you.

Thank you. I thought I would catch you talking, and I would slip another one in. Thank you, Mr. Chairman.

The CHAIRMAN. The gentleman's time has expired.

The Chair recognizes the gentleman from Oregon, Mr. Blumenauer.

Mr. BLUMENAUER. Thank you, Mr. Chairman.

Mr. Vieau, is there a conversion kit available for those of us who drive a Toyota Highlander hybrid?

Mr. VIEAU. Not at this point in time. We do have plans to expand which modules we have available. We do have a Ford Escape, and we do have the Prius on a small scale, but we are in the process of completing testing and then scaling up from there into different models.

Mr. BLUMENAUER. Would you keep me on your mailing list?

Mr. VIEAU. We will do that for sure.

Mr. BLUMENAUER. Thank you. Thank you very much.

Mr. Lowe or others, I have a vision in the world of West Wing that if confronted with a recalcitrant Congress that I could envision a President's issuing an executive order that he is not going to wait for them, that since the Department of Defense is the largest consumer of energy in the world, since the Federal Government purchases thousands of vehicles a month, that he would just execute an executive order that says, "After September 30th, we are not going to purchase anything that is not a hybrid, that does not have the dual-fuel capacity and that does not have the capacity for a plug-in conversion." I can envision this on West Wing. I can also envision it in the next administration. It would also seem to me that this might be something that even some of our friends who are somewhat skeptical about broader applications in Congress might agree to as far as the Federal Government's leading by example.

Would any of you have any thoughts about the impact of a Federal Government executive order or Federal legislation that would mandate that the Federal Government do this within 6 months, a year and let those market signals ripple out?

Mr. LOWE. I think you are right that my character would advise President Bartlet that that might be a pretty good idea, and I do think perhaps it is an opportunity to tell Detroit, look, we are going to preorder a large number of these. You know, you are not going to go broke when you have the Federal Government buying X amount of vehicles.

Listen, I am really sympathetic to those concerns. I think we need to buttress that industry, and we need to not penalize that industry to the extent that we can, but you know, there has been such a lack of the bully pulpit on issues like this, and there is enough blame to go around. It is not a Republican or a Democrat issue. It just has not been at the forefront of the debate that it needs to be, particularly in a time of war. We should be hearing as much about this as our plans in the Middle East and as we are hearing about anything else, and we just hear nothing, and I am hopeful that that will change in the next administration regardless of what party controls the White House.

Mr. GAFFNEY. Could I just add to that?

There is no reason why this should wait for the next administration. The President has diagnosed our condition as addicted to oil,

this President. I mean you talk about Nixon's going to China. This is an opportunity—I have argued it with my friends in the administration. This is an opportunity for this President to make—you are absolutely right—the Federal Government an early adopter that will enormously catalyze the kinds of industrial retooling and changes that are required from both a national security and an economic point of view.

Mr. HOOVER. I would like to add one final thing.

There is one specific part of the government that is made to order for plug-in hybrids, and that is the U.S. postal system. If you look at how their vehicles are used, it is a no-brainer that they should be moving to this technology.

Mr. VIEAU. This is an important message for me on the problem that we face in trying to execute more efficient battery systems, and the same thing carries across into flex fuels and the like.

At the working level, we go in to our business partners in industries that have tremendous resources, and we say, "We want you to work on 'such and such' chemical that will have a huge impact." they say, "There is no demand." they say, "There is no market. When you get a market and there is a demand, we will come back and work on it." I am talking about major multinationals in North America today and around the world.

Three years ago, I went forward and said, "Hey, we have got brand new technology." I sat with some major corporations and said, "We are going to start moving into this area." they said, "You are kidding yourself. There is no market."

What the government needs to do is to demonstrate that there is a market and a capability. That is what you would do with that activity.

Mr. BLUMENAUER. Mr. Chairman, I appreciate your courtesy. I feel extraordinarily strongly that recommendation come from this committee that the Federal Government be that early adopter, that the Federal Government work with friends like we have here on this panel to decide what is the earliest feasible date and we set down a marker.

I am mindful that the war in Iraq is the most energy-intensive military operation in the history of the world, four times more intense than was the first Gulf War—16 gallons of fuel per day per soldier. It is putting our soldiers' lives at risk. It is costing an inordinate amount of money. This would have a broad ripple effect, and I would hope we could work with the committee and our friends here to establish that marker and to move it forward.

The CHAIRMAN. I think that the gentleman has made an excellent suggestion, and I would recommend that we work with the Republicans on the committee to adopt that as a recommendation.

The gentleman's time has expired. I apologize to you. We need unanimous consent for the gentleman from Washington State to ask one quick question before we end the hearing.

I am going to ask each one of the witnesses, at the conclusion of the questioning from Mr. Inslee, to each give us a 1-minute summary statement of what you want the committee to remember as we leave.

The gentleman from Washington.

Mr. INSLEE. Thank you, Mr. Chairman.

Mr. Vieau, I wanted to make sure that we had clarity. I was asking about the costs both of the batteries and of the operating costs, and I wanted to make sure we got the right answer. I want to ask you:

When these batteries become part of the original manufacturing, when it is not a conversion but when in fact it is part of the original manufacturing—we are doing 200,000 units every couple of months. This is a mainstream part of the industry, and I believe we are going to get to that position.

When we get to that position, could you give us, first, a projection of what that cost may be relative to just a hybrid today—and I realize it is just a projection—and second, what the per mile cost at that point will be of running the car when it is on the electrical mode versus gasoline per mile today?

Again, these are projections, but if you can just give us your best shot, we would appreciate it.

Mr. VIEAU. On the first part, I think I can give a pretty clear answer. The second part may be a little more challenging for me. On the cost of the system today as we talk about a system that is available for less than $10,000 next year, coming down in the range of 40 percent over a 3- to 5-year period, this is a system that we create which has redundant capabilities in it to an existing vehicle. We must create a system that adds more materials and more competency than if you put it in the car. So, clearly, if you build a system into the car, which is being done today, the cost is going to be significantly less, and I would say it will be in the range of another 30 to 40 percent less than that by eliminating redundant components. So take that $10,000 system down to $3,000 or $4,000, and you have a system that could be implemented to create an 80 percent fuel savings and a 60 percent reduction in emissions.

I do not have a number off the top of my head that tells you on a per mile basis exactly what that translates into. I am not sure if I can get any help from anyone here.

It would be about 2 or 3 cents a mile according to my colleague.

Mr. INSLEE. Clearly, you will save money over the life of the car with those numbers. Thank you.

Mr. VIEAU. Thank you.

The CHAIRMAN. Thank you, Mr. Vieau.

Let us go in reverse order of the opening statements, and we will ask each one of our witnesses to now give us their concluding comments that they want the committee to remember as we are moving forward with policymaking this year.

We will begin with you, Mr. Hoover.

Mr. HOOVER. Thank you, Mr. Chairman.

From Austin Energy's viewpoint, what we have tried to do with plug-in partners is to actually create a market research program for the automakers to demonstrate to them that there actually is a market out there. From our vast number of partners, there is a lot of interest in buying these cars. The only thing we ever get asked is how soon can we get them.

Our view is that Congress, through its appropriations, can support advanced battery research to make sure that the battery problem gets solved, and then at that point it becomes incentives both

from the Federal Government's purchase of these vehicles to incentives for consumers to purchase these vehicles.

The CHAIRMAN. Thank you, Mr. Hoover.

Mr. Gaffney.

Mr. GAFFNEY. Mr. Chairman, a quick point on Mr. Blumenauer's last comment.

Not only is this an intensive, energy-demanding environment in Iraq, but one of the most dangerous things we are doing is moving fuel around inside the country. So there is a tremendous imperative. I mentioned I was on the Defense Science Board's review of this. There is intense interest in figuring out how to make the Defense Department more energy independent, and this technology, I think, can play a role.

We should not be in the business of picking winners and losers. We should be moving aggressively to facilitate an industrial base that taps into the best of these technologies and does so, I think, in a dynamic way.

I am all in favor of an executive order. I would be delighted to work with you on that if I could. I think one of the issues we are going to bump up against probably in crafting of it is in trying to encourage American sources to be utilized, especially as that conflicts, for reasons we have been talking about all morning, with how fast you can do it.

Finally, Mr. Chairman, as I have said in my testimony repeatedly, there is a national security imperative to all of this. We are, I believe, in mortal peril of an oil collapse of some kind. I do not know whether it will be from a terrorist's taking out a key facility or whether it will be from some government or other deciding not to sell to us, but this is a peril that we see coming. We need to be doing all of these things as aggressively as possible.

I will commend you, if I may, Mr. Chairman. I would like to submit for the record the Set America Free blueprint that this coalition of national security-minded people, labor people, all different kinds of environmentalists, and so on have come together around specifically because I think what it suggests is we will wind up doing every single one of these recommendations later, if not sooner, and "later" is going to be harder.

The CHAIRMAN. My father always said, "Try to start out where you are going to be forced to wind up, because it is prettier that way." So we hope that we are now on that new course. I thank you, Mr. Gaffney.

Mr. Lowe.

Mr. LOWE. The first money I ever made as an actor, when I had a moment to invest it, I invested in an alternative energy source. That was over 20 years ago. So this is an area that I have cared about for a long time, but it is recent events in the world—global warming reaching this sort of critical mass—that has gotten me off the sidelines and brought me here today.

I am not a big proponent of taxes. I am just not. That said, I do think there is a time when you invest in something that has the potential to create new industry, particularly the kind of new industry that secures our Nation and that cleans our environment, and so I would urge you and your colleagues to do whatever you can to help, whether it is by the early-user tax credits or by any

other economic incentives that you can come up with to jump start this industry, particularly with the plug-in hybrid cars that are ready to go on the road today.

The CHAIRMAN. Thank you, Mr. Lowe, very much.

Mr. Vieau.

Mr. VIEAU. In January, Bob Lutz, the Vice Chairman of General Motors, stepped up in front of the public and said that he has found some battery technology in Boston, Massachusetts that is changing their view about the limitations of batteries, and they believe that the technology exists today sufficiently so that they are willing to commit to a new model of electric vehicle based around this competency.

I am going to repeat what I said earlier. I think the strongest message that we can make is that we do not believe that you have any legislative opportunity in front of you that can provide a greater return for a limited investment using current infrastructure than what we are talking about today in the near term, and so we appreciate the effort that you have made, and we hope that you can continue with your efforts and support this activity.

The CHAIRMAN. Thank you, Mr. Vieau, very much. I know, Mr. Vieau, that your technology comes from MIT.

When the Soviet Union challenged us with Sputnik, President Kennedy asked Jerome Wiesner, a professor from MIT, to become his science adviser and to help shepherd through this goal of putting a man on the Moon and returning him to Earth in 8 years, and we were successful.

When the Soviet Union threatened us, potentially, with a nuclear strike that could destroy our communications capacity, MIT developed a new technology that first was called "DARPANet," and it is now called the "Internet," and we have deployed it ubiquitously around the world.

Hopefully, our technology, the technology at A123 which has come out of MIT, can be embraced as well, at least as a concept where not only your company but dozens of other companies could accept this challenge to give us the capacity to break our dependence on imported oil and to give this technology to the rest of the world as well. It is that important for our energy security and also for our national security.

This panel, I think, has helped to really focus us on this issue. Speaker Pelosi created this select committee as her only select committee in her first 2 years as Speaker of the House, and it was to have these kinds of hearings, and I can promise you that, in the legislation which we are considering this year, the kind of tax incentives and regulatory changes are now being seriously considered that can hopefully open up these new technologies to adoption and to telescope the time frame it takes in order to see them deployed ubiquitously, not only across our country but across the world.

We thank you for your testimony today. This hearing is adjourned.

[Whereupon, at 11:54 a.m., the committee was adjourned.]