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Deputy Director- Office of Transportation & Air Quality at the U.S. Environmental
Protection Agency (EPA)
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The Changing U.S. Landscape for Climate Change Policy

Good Afternoon, and thank you for having me. It's a pretty sobering time to be here today and in the auto industry in general. I grew up down the road in Kalamazoo, Michigan; I've been a car guy. All my life I had a subscription to Road & Track Magazine long before I had a driver's license. So, it's very painful for me and many other people I work with at EPA to read the news everyday and get the latest bad headline, because to me that translates into a lot of families who are suffering, and I cannot imagine what it's like to work in this sector right now with the uncertainty and with the market the way it is, and with car sales down as more than I think anyone really ever imagined.

At the same time, I have to admit I'm an optimist by nature. And I think for anyone that's working in the industry now or working with the industry as we do at EPA, the prospect of being around at the time and helping perhaps create the renaissance of this industry, and being there to help create perhaps the future mobility of the world is also a pretty daunting and exciting task. And so I think if it's possible to be living in a moment of history where it's very, very sobering and probably very scary due to all the uncertainty, I think is tempered by the opportunity we all have to invent that new future, and for engineers, that's always an exciting thing to be – place to be. And that's frankly why Margo, my boss in Washington is unable to be here today. Our team, along with others across the governance is working night and day, to be quite honest, with the President's automotive task force. We want to be part of the solution, and part of the solution is trying to figure out what are going to be the economic costs and benefits of future regulatory requirements as the government tries to make these difficult viability decisions with respect to General Motors and Chrysler. And so it's a very, very intense period of time in our organization as we work through the very complicated choices that confront us.

The name of my presentation is: "The Changing U.S. Landscape for Climate Change Policy." I've been involved in Presidential transitions since 1980, and I've got to tell you that the pace of change and the pace during this transition is really quite breathtaking. I've never seen anything like it. And my job today is to try to convey what this landscape is going to look like as best I can. I've got a lot of material to cover. I'm going to try to move through this information pretty quickly because I prefer that this become more of a conversation where you can ask questions and I'll do my best to answer them.

At the new EPA, under the new President and our new Administrator, whose name is Lisa Jackson, and by the way, the first ever Administrator of EPA who happens to be an engineer. She has a master's in chemical engineering from Princeton University and is very determined and very gracious boss to have. We've been able to spend quite a bit of time with her, because many of the big decisions confronting EPA in these early days happen to be in our portfolio, and I'll touch on some of those. But, she sent out a memo, as we like to do in governments, become known as the Day One Memo, where she laid out the three most important values of the (President Barack) Obama-EPA. And they are that we've – all our decisions will be governed by the best science that's available, that will be guided by the law, and that everything we do will be transparent to those of you who pay our salaries. So, I mention that because I am going to shoot straight with you and try to answer the questions to the best of my ability.

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Now, I do also have to say I was present at the first Task Force Meeting of this Auto Task Force and the co-chairs of the task force, (Treasury Secretary) Tim Geithner and (National Economic Council (NEC) Director) Larry Summers looked us all in the eye and said this is going to be an experiment and we're going to trust all of you to be discreet because what we're going to be talking about here is very sensitive. There are a lot of securities that are traded in these companies. And the only thing – you can only say three sentences about this work, and each sentence must begin with: "As the President has said." So there are some things I'm not going to be able to be transparent about, but I'll do my best to let you know what's going on.

So, I wanted to review how quickly the world has changed in the last three years. It was only three years ago, in 2006, that Al Gore released a documentary called '*An Inconvenient Truth*.' I happened to actually witness the former Vice President present this PowerPoint presentation live before he made a documentary and it was a pretty amazing experience. Many people in the crowd thought that: "Boy, if he was this funny, and this down-to-earth, and this articulate during the campaign, we might be living in a very different world." But who would have imagined, certainly no one in the audience then and even today would have imagined that millions of Americans would spend \$10 to listen to Al Gore lecture them about climate change. But that's exactly what happened. And from my point of view that film and the subsequent Oscar buzz and Oscar Award did more to raise public awareness than anything EPA or the non-governmental organizations might have done to date to raise the public awareness that this climate change thing really might be a problem.

In 2007, the United Nations Inter-Governmental Panel on Climate Change released its fourth assessment report. These are 2000 scientists, by the way, appointed by their governments. All the countries that had signed the original Framework Convention on Climate Change, appoint leading scientists in their field to this panel. And every three or four year they assess the latest science in this area. And their key findings, and I quote was "Warming of the climate system is unequivocal." Now I read each of the reports leading up to that and you can tell how in each report the uncertainty has been reduced and the language becomes more and more powerful. Unequivocal is a pretty strong English language. Then the second key finding for policy makers was most of the observed increase in temperatures is very likely, and in their terminology, that means greater than 90% probability, very likely due to the increase in anthropogenic greenhouse gas concentrations.

To me, this was the second major event. I think this, more than anything else created a political consensus in our system that this is a real problem and the government needed to act. Now, we're very far away from a consensus on what should be done, and I expect a lively debate this year and probably next over what the right government action should be. But I think this, more than anything else, created a political consensus that something had to happen and the government needs to intervene.

Now, since 2007 of course, our understanding of the seriousness of this problem has only increased and the impacts look like they're happening more rapidly, and will be more severe than what we thought of two years ago.

The other major event and the one that created most of the change in my life was United States Supreme Court decided in the case called Massachusetts versus EPA that EPA may have a duty to regulate in this arena. We were petitioned in 1999, I think by a number of environmental groups and states to regulate greenhouse gases from automobiles. The opinion of the Bush Administration at the time was that carbon dioxide was not a pollutant in the meaning of Clean Air Act, and even if it was, we've got other policies that are addressing this problem and we don't see a need to regulate. The court saw this differently.

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They in fact spent very little uptime on whether or not CO2 was a pollutant. They decided that pretty easily. But they also said that a secondary reason that even if it was a pollutant, CAFE (Corporate Average Fuel Economy regulation) is handling this. We've got lot of R&D going on. There are plenty of things going on in the government to address this problem. And they slapped us down pretty hard on that, in fact, and I quote now "The fact that the Department of Transportation has overlapping responsibilities to save energy, it no way allows EPA to shirk its responsibilities to protect the environment."

So, there is really only one permissible reason for us to not regulate greenhouse gases in the Clean Air Act, and that is if we find that greenhouse gas emissions do not pose a danger to public health or the environment, or we decide that the science is too uncertain. So, what the court told us is: "you have to decide that." And as a career employee of EPA, the fact that it has taken us two years to respond to that directive is a big, big embarrassment, which was recently annihilated. I will get to that in a moment. But the fact that what many people in the world consider the leading environmental agency did not have an official position on climate change science was really an embarrassment to the country.

Of course, the other thing that happened last year is that we elected a new President, and he said shortly after he was elected to a gathering of governors from around the world: "Now is the time to confront this challenge once and for all. Delay is no longer an option. Denial is no longer an acceptable response." So, I think across our government, certainly the new political leadership as well as the senior career officials like myself who serve political bosses, we're all seized by a sense of renewed urgency and importance of this task. And the President certainly has acted consistent with what he said in the campaign since January 21. In fact, on Day 7 or 6, he was inaugurated on a Tuesday, the following Monday, my boss was invited to the White House press event, where he signed a presidential memorandum directing EPA to reconsider its decision to deny California the ability to regulate greenhouse gases from automobiles. It's known as the California Waiver. It was a pretty notorious decision, which created a lot of debate and controversy, and congressional investigations, which is something you don't want to ever have to live through as I did about what were our reasonings in denying this waiver for California to adopt their own standards. And make no mistake, and I think the President said this to the press conference (sic) the reason where we are right now with the automotive industry finding itself in triple jeopardy with the possibility of California regulations, EPA regulations under the supreme court decision, and CAFE regulations is solely due a lack of coherent Federal policy in this matter. California would not have acted if there was responsible leadership from Washington. And I think that is changing, I'll address that later in my talk.

On the same day, he directed the Department of Transportation to reconsider how it goes about setting fuel economy standards and to work closely with EPA in doing so. The CAFE proposal generated a lot of negative comments from across the spectrum in terms of assumptions and costs and benefits and other reasoning that they used to set their standard. And the President has asked them to reconsider that and to work with EPA and the Energy Department on how they do that.

In his first address to Congress, he asked Congress to deliver to him comprehensive cap-and-trade legislation to reduce greenhouse gases from our economy, and he also signed a rather large stimulus package, which directs a lot of money at not only energy conservation but also investing in new technology to get us to a low carbon future. And that's in the first 30 days. Subsequent to that, he submitted to Congress his proposed 2010 budget, which had a specific language in it for the first time, where the government has signed on to specific reduction targets, which are 14% across the economy reduction from 2005 baseline, 14% reduction by 2020 and an 83% reduction by 2050, again from a 2005 baseline.

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And that the program will be implemented through a cap-and-trade scheme. He has signaled that as his preference. And we know through that successful Acid Rain Program that these types of market-based approaches can be very successful.

What we've done since January 21 is we've already held a public hearing to take comment on whether or not we should change our mind with respect to the California Standards. We've proposed a mandatory reporting rule for all sectors of the economy requiring reporting of greenhouse gas emissions over a certain threshold for firms to report to the government what their greenhouse gas emissions are. This is essential to designing a wise and sensible regulatory scheme. And just last week EPA proposed a finding that greenhouse gas emissions in fact do endanger public health and welfare which is the first step down a regulatory pathway.

Now in announcing this endangerment finding – that's what we call it – Lisa Jackson indicated that our preference is for comprehensive legislative solution to the crisis of climate change. We're working very closely with Congress on such a comprehensive approach, but it is a pretty heavy lift. And anyone who has been in Washington for very long knows that when Congress tries to do something big and do something fast, the outcome is not something that we ordinarily like to see. So this is a big job, it is a very complicated job for Congress, there are lot of different regional and other interests that are at stake. The President has asked for comprehensive legislation by the end of this year and that is pretty optimistic. So we'll see. In the meantime, we now have an obligation to begin regulating green house gases beginning with automobiles and we are starting down that path. So what does all this mean for the automotive business, what do these changes mean?

Well, one of my slides has a very funny cartoon – it's a couple driving down the road in what looks to be a Model T Ford and the balloon says it only gets 20 miles per gallon, but in a hundred years, that will be vastly improved. And then my next slide is from our fuel economy trends report which shows that the combined current truck fleet last year did slightly better than 20 miles per gallon. So, we're still at 20 miles per gallon, and those of you in the business know the reasons behind that. I think those Model T drivers would truly be astonished at how much better the typical automobile is today in terms of safety, in terms of performance, in terms of durability, in terms of other attributes. But they probably would have expected that the efficiency, I should say, the fuel economies would have been better than 20 miles per gallon. I happen to believe that again, the government has to share this responsibility for the fact that we are here and obviously one of the most important reasons why we are here is because we've enjoyed cheap energy for many, many years in this country. But these low prices combined with respect to shifts in the vehicle mix is why we are – where we are in terms of the overall new vehicle fleet economy.

Now, obviously for those of you in the business, you know that the industry has not been standing still. In fact, indeed this is very much of a technology driven industry. But, the market has chosen to use that technology in very different ways. In fact, since -- I have a great slide here ... since the 1980 horsepower, this is of the average vehicle, car truck has gone from a 102 horsepower average and 3,200 pounds to last year the average horsepower of the average vehicle was at 222 horsepower, so greater than 100% increase in horsepower, corresponding drop in the 0-60 times and the average vehicle now sold in America is over 4,000 pounds. So that is where the technology has been going, the facts are what they are. The question is what is the typical vehicle going to look like in 10 or 20 years, and that is what we are here to talk about.

Another bit of context in terms of green house gases, the U.S. transportation sector, so that includes passenger vehicles, highway trucks, off road equipment, as a sector, it makes more green house gases than all but six countries in the world release from their entire economy. Or put in another way, our transportation sector is bigger than the total green house gas emissions of all but 6 countries in the world including United States. So, it's a significant source. Also, we use two-thirds of our oil. So if you're a climate skeptic, there are still very good reasons for us to transform the technology of this sector.

So, let me talk a little about cap-and-trade. You've all read about cap-and-trade, you know that that is the President's preference, you know the Europeans are about there. What does that mean for transportation? First, for the uninitiated, very simply cap means that we as a country decide that we're going to impose a cap across the economy if no more than x tons will be released. And then through either auctions or other processes, we'll allocate two firms' allowances for them to admit. And cap will then decline over time. So the idea is for those firms that have got great technology that they do better than their allowance, there will be a market to sell those credits, and there will be an incentive to reduce energy and reduce green house gases. That is kind of the simplest, and that is how we approach the Acid Rain Program, and it's a system that really rewards innovation.

Most caps would be placed upstream in the economy. Most cap proposals include, including the most recent one by Mr. Waxman includes fuel production, transportation fuels will be included under the cap. Now the problem is – and we have analyzed the last cap-and-trade proposal called the Warner – Lieberman. Such an upstream cap provides very few reductions from the transportation sector downstream. And the reason is, based on our economic modeling, the price signal that would result from this upstream cap, the price signal to people that use fuel is relatively modest. So the type of caps that have been proposed in Congress would provide only about 5% to 10% green house gas reductions from the transportation sector, and that's in relationship to maybe 32% - 33% of the problem. So it's not an effective tool to motivate investment or changes in behavior or bring in new technology. We estimated at the time last year that the price signal in 2030 might have been \$0.50 a gallon, and that is not enough to get someone to invest in electric drive technology or advanced gasoline technology or to persuade you and me to drive less. So it's not going to create this change in demand, which is why most people who thought about this – including EPA – and in fact now in the discussion draft and Congress believe that complimentary measures are going to be required to motivate transformational technology change in this sector.

And in fact, there is an organization called US CAP, the Climate Action Partnership of which DuPont is a member, and they have developed a blueprint for legislative action. And I was there when they came in and briefed the EPA on it right after the election. And this partnership includes 30 major corporations, major emitters BP, Ford, General Motors, Chrysler, other chemical companies, major utilities as well as environmental groups came together over the last two years, hammered out this blue print for Congress. And if you follow this stuff, the discussion draft, the proposed bill, borrows an enormous amount of thinking and approach from this blueprint, because this was consensus recommendation. So I think to a politician, if this group of major firms and environmental groups can agree that this is the right answer – that is pretty powerful. And what this group says is, we need an economy-wide cap, fuels need to be under that cap, but we also need complimentary measures for important sectors. And so for the transportation sector, they are recommending that we need to have a vehicle related green house gas, performance standards, we need a low-carbon fuel standard, and we also need government policies that will address the growing demand both in the freight sector and in the passenger vehicle sector.

And in fact, in all of the opening statements and press releases surrounding the Waxman discussion draft, they reference this blueprint and they reference this approach, their recommendations and say that they base the legislation in large part on this blueprint.

So, let me just touch a little bit on vehicle related measures and what we're trying to do. As I mentioned, the automotive industry finds itself now in triple jeopardy. And kind of the doomsday scenario is that they are going to be regulated in three different ways by three different regulatory agencies; California, EPA, and Department of Transportation. Now to me that would really be a bad result and would constitute bad government, and we're working very hard to avoid that situation and in fact a big part of the task of the Presidential Automotive Task Force is to come up with a national policy that will preserve both agency's regulatory responsibilities, provide California and other states with greenhouse gas reductions that they need, and importantly, allow for manufacturers to come up with a single compliance strategy and a single technology strategy to meet those requirements. So the goal is that General Motors and Chrysler and Toyota can build a single fleet of vehicles that will satisfy these parameters, and we've been working very hard to try to thread that needle and come up with that one national policy. And I'm very optimistic that we will succeed, because we have to succeed. As I said, the President has been very clear that we have to succeed and also has provided a great sense of urgency to all the different players involved including the automotive industry and EPA and Department of Transportation that this can be done, and I think it will be done.

The Supreme Court decision covered not just passenger vehicles but also heavy-duty truck vehicles. And so we're going to have to come up with a regulatory strategy to reduce greenhouse gases from heavy-duty trucks. And I don't know, if you're in the business of supplying to that sector or work for an OEM, but we understand the sector pretty well. We've been regulating heavy trucks for diesel emissions and gasoline emissions for nearly 30 years. We also know that we're going to have to take a very different approach because if we just look at the engine we'll only cover about 20% of the problem; we need to look at the entire vehicle. We also need to come up with a new way to test the efficiency and greenhouse gas emissions from that vehicle because 60% of the energy demand is going to be coming from how the trailer is designed and how the vehicle is designed. So we're going to need new thinking to reduce greenhouse gas from the second largest part of the transportation sector. Roughly 18% of the emissions come from heavy-duty trucks, and it's the fastest growing part of the transportation sector. And in fact the engine manufacturers and truck manufacturers were in to see the Administrator of EPA yesterday and very much want to work with EPA to come up with sensible rules that will lower greenhouse gases from that sector.

Let me say a little bit about fuels, I'm going to have some really nice charts here. We've been tasked under the Energy Independence and Security Act to come up with a renewable fuel standard that's going to increase by five times the amount of renewable fuels that will be required to be used in the transportation fuel market, going from today's standard volume of roughly 9 billion gallons to 36 billion gallons by 2022. And that's a pretty steep ramp-up and pretty big job. Most of that growth as you can see on this chart will be fueled by what we call advanced biofuels. So primarily non-food feed stocks of biofuels. What has made this standard setting process so interesting to us as well as to people in the business is for the first time, Congress required us to undertake lifecycle assessment tools to set the standard because the law sets up four different categories of fuels and sets a greenhouse gas performance reduction threshold by which these fuels would be qualified to earn the credits and so that obligated parties can comply with the standard. And so for example conventional, what we call conventional renewable fuel, which would be ethanol from cornstarches, has to be 20% better than the fuels replacing, which is 2005 Gasoline. Cellulosic renewable fuel to count has to be 60% better on a lifecycle basis.

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And so what we've discovered through this work – aficionados won't be surprised – is that not all renewable fuel is created equally and that there is great renewable fuel and there is not so great renewable fuel, particularly when you look at this entire lifecycle. Now there is another little quirk of the law, which is how Congress defined lifecycle greenhouse gas emissions. And I quote: "Including direct emissions and significant indirect emissions such as significant emissions from land-use change." This changed everything. The first standard we set a couple of years ago, we just looked at direct emissions and it turns out these indirect emissions are significant.

Now most lifecycle analytical processes look at just production process and distribution of the fuel in the economy. To understand these indirect emissions, we need to understand the markets, and we need to use economic models to predict what these indirect emissions are. And very simply the indirect emissions is a ripple effect; you grow more corn, a commodity farmer is going to make different choices, the price of that corn is going to go up a little bit, and he will very likely move more acres into corn production to take advantage of that; it's a very rational shift in crops. That in turn will mean that we're probably going to export a little bit less corn to the world market; the world is hungry, the world needs corn. That means someone else is going to grow that corn. When that land is converted to grow that corn, that's going to result in an impact and it's going to depend on how much land is converted, what type of land is converted and so on. If it's forest, it's going to have a bigger impact than if it's savanna. So EPA has spent an enormous amount of time and effort and resources working with the agricultural department, working with the academic community to gather the best science and process models and economic models to try to understand what this overall impact is going to be. And we've been sharing the results of that analysis, and while I don't want to get into the details because I'm almost out of time. Suffice it to say that the results of our analysis is inconvenient to some stakeholders. And so this has just generated a lot of controversy, and we've done a lot of sensitivity analysis around this because there is uncertainty, we know there is uncertainty. But we know also that there is going to be an impact, and the question is how much is that going to be the impact because the policy goal is to promote and grow sustainable renewable fuels, not fuels that are going to make the problem more difficult to address. So I won't get into the methodology in the interest of time. I cover what the key questions are internationally. By the way, most of this is an international effect.

In the United States, the land use impacts of these biofuel policies is relatively small because most of the land, we've already converted here in the United States.

The next step is to get this proposal out. I'm very optimistic that this proposal will be out very soon and we want to have, again getting back to the three values that are going to guide our decisions, science facts, law, transparency. We want to have a broad open conversation about our analysis, our sensitivity, our tools, and improve it between now and before we make any final decision. But we've gone to great lengths to have that dialog already. We sent a team down to Brazil for a week to meet with Brazilian sugarcane experts, and so we're frankly quite proud of how far we've advanced the science is a very robust analysis, and we're eager to start talking to others about it. And then we envision every three to five years improving the science and improving this analysis.

There are other key questions which maybe we'll get into in the Q&A with respect to renewable fuels. There are other sustainability issues surrounding again using crops for fuel including water consumption, air quality, infrastructure, and distribution of these fuels, some of which are not easy to get around. Are there going to be enough vehicles in the marketplace to use all of this new fuel?

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What about this so called blend wall and there is an interest in allowing higher level become mid-level blends of ethanol above 10% and that's going to be a very interesting conversation.

The magnitude of the challenge is pretty stark. If you could see this chart, business as usual for the transportation sector, even with this 36 billion gallons of renewable fuel by 2022, even with the congressionally mandated 35 mpg new CAFE standard combined for cars and trucks, the slope of that line continues to go up. And if you apply the President's 83% reduction target to transportation as a fair share, there is a big gap between business-as-usual and where science says we need to be by mid century. And I know it's a big assumption to assume that transportation ought to do its "fair share," and certainly economists in the room would dispute that, but even if it's a 20% reduction between now and 2050 given the growth, that's a pretty heavy lift. And it means cars are the future, cars in mid century, the entire fleet in mid century needs to look very, very different than it looks like today. And if we're going to hit that mid-century fleet, it means we need to start selling these new technology vehicles beginning in 2030. So the task is enormous.

Of course, I think there's going to be very real pressure, in light of our economic crisis. Both substandard pressure and political pressure to slowdown, and there are voices and some of them I heard yesterday in the first hearing of the Waxman Discussion Draft that we need to go slow. We need to -- we ought to write our economic ship first, before we sail off to this low-carbon horizon. And I think if we accept that reasoning, we'll be making a huge and consequential mistake. I think the problem that we've had in our society, in our economy, in our financial markets is that we do way too much short-term thinking. Our competitors are much better at planning longer term. And I think if we keep looking only a few years down the road, we're going to get left behind in this new low-carbon economic revolution that a lot of people and observers think is on the horizon.

Now transitioning that is not going to be free. It's going to require some upfront -- a lot of upfront investments. It's going to require federal policies that are going to encourage alternatives. But we have to -- I think the science demands it, and I think our competitors demand that we get started now. And if we wait, I fear our country is going to get left behind, and that our competitors -- some of whom are already ahead of us in the automotive world will -- it's going to be that much harder to catch up. But it's really going to be essential, I think to move it to this transition that there's going to be clear and unambiguous policy signals on both the price of carbon and where we need to be unleash the kind of innovation that's going to be required.

But I think there's also one another key reason why we shouldn't delay. Another tool to get us out of this current economic crisis where and it's going to be a lot of physical stimulus, not just by our government but by governments around the world. And if that government physical stimulus is invested in old technology or the wrong technology, it's going to make it even harder for the world to dig out of this carbon hole that we find ourselves in. And that's why our plan has roughly \$100 billion going toward this type of Green Technology. China incidentally, a competitor I'm very worried about, is doing the same thing and their stimulus plan has a \$50 billion, again based or invested in these types of Green Technology. So it will be a heavy lift. It's going to be, there is no question. It's going to be hard work, but I don't think we have any time to lose, and let's resolve to work together on this and be guided by the science to not let the enemy be the -- not let the "perfect" be the enemy of the "good," and be guided by what's possible and at all times use our common sense and aim it up to common good. Thank you for listening, and I'd be delighted to take as many questions as you have.

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Question and Answer Session

Question – Non-uniform national standards currently impose huge financial burdens on carmakers and ultimately on consumers. How do we get pass this two sensible consistent set of regulations?

Answer (Grundler) – I think it was the Chief of Staff of President Obama who said ... never waste a crisis ... I think the kind of the urgency of saving the strong domestic automotive industry is the opportunity to come up with a national -- a coordinated national policy that will not only address the concerns about a confusing patchwork of standards, but can also position our domestic automotive industry in such a way that they can be leaders. So I think the way the policymakers are looking at it, is this an opportunity if we're going to invest in these companies as a country, this is an opportunity to make sure that those investments will drive the type of technology transformation that science is demanding, and that the public will get significant benefit from that.

So what we're working on very hard right now, as I mentioned in my remarks, is figuring out what those requirements should look like and threading this needle and coming up with a way to have a result where automakers can build one fleet of cars, so they can sell in all 50 states that will provide the kind of benefits that we're looking for. And I think that's possible, and I've got a very good example. California has a long history of leading because of their history of very severe air quality impacts, but in those instances where EPA took the lead and came up with a good result, and I'm speaking now of our clean diesel rules for heavy-duty trucks and off-road machines, guess what, California adopted the federal program.

So the problem was we weren't leading on greenhouse gases, and so there was nothing for them to adopt and nothing for them to follow. So I'm convinced if we come up with a result that's good enough and California, in fact, has said this publicly, I'm confident that as they have done in the past on our EPA clean diesel standards, they will adopt a national policy.

Question – So will biofuels change how mile per gallon is recorded, and if so, will the EPA look at going to a European carbon dioxide per kilometer type of system?

Answer (Grundler) – I don't think that the biofuels question is necessarily going to drive it, but it will be a factor, and the bottom line is yes. The type of a policy we are thinking about, and now that we have a repose and danger in finding kind of Clean Air Act rules governing vehicles, greenhouse gas emissions from vehicles, will be expressed in a carbon metric, most likely CO2 equivalent mile per gallon -- CO2 equivalent grams per mile. And the advantages are going to a carbon-based metric are numerous, and I won't pre-label them here. I'll just give one example: we can imagine a national policy that would provide flexibilities to manufacturers to meet that standard by either powertrain changes, as well as air conditioning improvements. As we know that air conditioning has a non-trivial impact on both tailpipe greenhouse gas emissions, as well as greenhouse gas emissions through leaks and the truth is that OEMs have not had any incentive to improve air conditioning systems.

And by a Clean Air Act type CO2 metric approach, this would I think provide a valuable flexibility to our car makers to meet those standards through more than one way or through, a combined -- more likely a combined approach, and we think that's a smart way to go.

Question – What specific issues would prevent the EPA from granting the waiver request for use of E15, as a substantially similar gasoline? When do you foresee Emission Certification Gasoline containing ethanol?

Answer (Grundler) – Again, this is another opportunity for me to repeat the values that we've all been told are going to guide everything we do. And that's: What are the facts; what is the law; and whatever we decide we should do it at an open transparent way. We do have a petition in for our waiver for gasoline up to a 15% ethanol blend. The law has some very specific requirements that have to guide our decisions and the most important one is: we have to find that there is evidence that such a higher-level ethanol blend would not cause or contribute to a failure of the emission control system, throughout the useful life of its vehicle, something like that.

So basically, we have to determine that there's enough evidence that an E15 gasoline is not going to result in some type of systems failure. So we're interested and we've asked for, we've put out a public notice, we're asking for this data both durability data, as well as performance data and that's what will guide our decision. Now the good news is we've been working very closely with the CRC and the Energy Department on a pretty comprehensive testing program of vehicles that will allow us to make a fact-based decision. We also have to consider the impact of these blends on equipment and we've heard early and often from people that make small engines and boat motors, are very concerned about the impact of higher blends on their products. So that will be part of this consideration as well.

Question – Is the electric car really green in your perspective, since electricity generation uses a lot of coal in the United States and around the world?

Answer (Grundler) – And the obvious answer is: It depends. We've done a quite a bit of analysis, because there is a lot of exuberance about electric vehicles and plug-in hybrid vehicles. And what's great about EPA is we do have a lot of really sophisticated tools to allow us to analyze that question. So we have done that analysis, where we linked our power generation electric utility models with our vehicle models. And the answer is again it depends.

Right now, if you use an average national grid type of number for the upstream emissions, and you take an optimistic 40-mile per gallon -- 40 mile or electric range plug-in hybrid. It's about as good as today's gasoline electric vehicle. Now, if you drive that vehicle and you recharge at night, there are lots of different assumptions that you use to come up with the answer of these questions. If you use that vehicle in California, which has got a pretty clean utility mix, it's better. And how does the customer use that vehicle, when does he or she recharge, all this goes into this equation. But I will tell you that again if we need to get to -- where science is, we need to be by mid-century. And by the way, that's to avert the worst impacts of climate change. The climate is changing, there's a lot in this system, the world is going to be different in 2050. So the type of reduction numbers I mentioned is to really avert the worst climatic impacts, based on what we know today. But if we're going to hit those targets, I can tell you today that the majority of vehicles in the fleet by mid-century need to have some kind of electric-drive component.

There's no doubt – the math won't work. So we do need to find breakthroughs in battery costs, we need to figure out how to get drivers over, what the automakers call range anxiety, and we need to clean up our electricity supply for that strategy to make sense.

Question – The focus of transportation regulation, is on low-carbon fuel and carbon dioxide emissions. What about emissions of mobile pollutants, should we expect tighter tailpipe and evaporative standards and when?

Answer (Grundler) – Right now, I can tell you our priority is completely focused on addressing greenhouse gas emissions. I mean today's car is, you've all heard this, 98% cleaner than it was when we began with. I think it's a tribute to your community and is probably the greatest public policy success story that the United States has that, which is a Clean Air Act, where if you look at all of the trends, economic growth, population growth, energy use, all up, Clean Air Act regulate emissions down by about a third. So VMT (Vehicle Miles Traveled) has increased. So the story on greenhouse gases is very different. And so my organization is focused very much on the greenhouse gas story right now. What will drive future local pollution standards will be our quality standard, and when those change, and they just have, that will drive what we need to do by sector. We do have some concerns that we've underestimated a fine particle pollution from the light-duty gasoline fleet. We think we've underestimated some heavy-duty emissions. So we're constantly learning. So I don't think our work is done, but all organizations have to make choices, and I think right now because of the economic and energy and climate demands on the country, we're going to be focusing on greenhouse gases.

Question – Instead of regulating carbon dioxide in fuel economy, why not raise the federal gas tax, so people choose to buy more fuel-efficient vehicles?

Answer (Grundler) – Well, that's a very good question. And if you ask any economist worth their salt, they will tell you that's the most efficient way to promote energy efficiency in our economy. I am an engineer, not an economist. Our economists have created a lot of stress in my life these days. But to be honest, I think you have to -- if we're going to solve this problem by mid-century, we have to address the demand side of this equation.

I've got a very clever chart on why if you deal with the transportation sector you have to deal with technology; on the vehicle you have to deal with the carbon content of the fuel and you have to deal with people. And that's going to be the hardest part of this because this is about freedom. And people in the regulatory business need to understand that especially in this country we're talking about the freedom of mobility. I love to cite this survey that I've read a number of years back, where Americans were asked to rank the top 10 things in modern life that they could not live without. And guess what was number one? The car. Electricity came in at number four, which tells me we'd rather be in the dark than to be without our car.

So another or more scholarly work was done, where Americans were asked to define freedom. And more people when asked that question mentioned their car, than mentioned the right to vote. So what that tells me is we've got to be pretty careful when we look at measures to try to get Americans to get out of their car.

But if we're constantly fighting this demand curve, which goes up -- which for as long as Federal Highways has been measuring this -- has been going up 2% to 3% a year until last year, when \$4 a gallon gas hit. And there was no growth between 2007 and 2008, first time since the government started tracking these statistics. So it was pretty remarkable, and again another lesson in economics that I mean you want to tax the bad stuff and not tax the good stuff.

Again our political system cannot handle the idea of energy taxes. The opponents to cap-and-trade are already calling it cap-and-tax legislation. So cheap energy seems to run along with property rights and is a cherished tradition in our country. So I think this is a generational issue. If you look at the housing permits, more housing permits are being taken in urban areas than in ex-urban areas. People are moving back into the cities. Younger people have a different view of this. So I can imagine a world, where people in America have a small, maybe battery vehicle for their city driving, for their work commute and so on and have another vehicle for other uses. I think that's where we need to be. Also you look at the data on transit, only 30% of trips taken on transit go from suburbs to the intercity. So if you're only going to get at, even if you could somehow magically, enormously increase ridership on transit, you're dealing with a third of the problem, whereas job creation is being in the suburbs.

Another very important demographic: women entering the workforce. Now you've got people in households going to different places. It's very hard for public transport to capture all those emissions in a country such as ours. So I'm not as optimistic on reducing demand as I am on technology and fuels. But it has to be part of the mix, the house discussion draft has measures in it, not mandatory measures, but incentive-based measures for communities to measure and report on greenhouse gas emissions. If they change their zoning, if they change their transit patterns, if they change their housing and land use ordinances that reduce greenhouse gas emissions, they get more money. So I think we're going to try to get it added from that soft way. But again, we have to be really smart about this, because of who we are.

Question – Can you comment on the major differences or similarities between the U.S. approach and the Europe and Asia approach to greenhouse emissions?

Answer (Grundler) – The attitude there (Europe) amongst the members of the public and in terms of business leadership is -- it's not an argument there. I mean CO2 matters to the average person and to the business leadership. So I think it's a little bit -- they're a little bit ahead of us in terms of integrating greenhouse gas considerations into business planning and into their culture. They're vastly more efficient in terms of use of electricity. Anyone who's traveled there knows that you go out into your hotel hallway, and it's dark until you move and the lights come on. They use water more efficiently. They have a more efficient economy because they've been pricing energy very differently than we have. So it has much, a much greater value there, their fuel taxes are very high. And again -- and it's not because they became all of a sudden much more aware of planet 20 years ago. They taxed gasoline to fund their government, not because ... of the concern of climate change.

Now but they do have many different other taxing incentives. So for example, your vehicle registration fee, you pay more when you purchase a vehicle if you have a big engine than if you buy less horsepower. And what has that created? That hasn't inspired a lot of innovation in the German automotive sector to build powerful, but small engines. So one of the technologies we're really high on is -- are these direct injection downsizable gasoline engines.

I drove one when I was there and it had amazing performance and yet had V-8 type performance in a much smaller package. So we're anticipating that that's going to -- we're going to see a lot more of that technology here. So their approach has been, use the tax code with respect to variable registration fees and fuel taxes. They have already adopted a cap-and-trade scheme, it's been a failure, frankly, because they didn't do the allowance system right, but they are -- as a general statement, they are past the arguing stage and into implementation.

Same in Japan. Japan has done a lot to increase the efficiency of their transportation sector, but they had a lot of help -- that's because -- their population is actually declining. So they are driving few and fewer miles here, because they are -- they have few and fewer babies born every year. They've also changed their fleet mix a lot too. They've got a lot more small vehicles in their fleet than they did a few years ago. But again, I think Japan in particular feels a lot of ownership for the climate change problem because of the Kyoto agreement in their government is very active in kind of what's coming next. And they are also being very strategic frankly.

So it's not that the European policymakers or the Asian policymakers are particularly more altruistic than we are. The Japanese see a very strong -- very strong technology position in steel and in autos and in few other areas, and they are an export nation. And they see -- that their interests are served by the world reducing these emissions. Same with some of the other European nations. That's why there is such a huge competitiveness angle here, and why we feel such an urgency to move to this low-carbon future -- there is going to be a huge economic opportunity once we get of this trough to -- if we can get these policy signals right. And the Europeans and some Asian countries are already on that path.

Question – India and China have rejected emission caps, will the EPA implement caps in the U.S. without global consensus?

Answer (Grundler) – That's a great question. Here's a lesson we learned from Kyoto, where the entire government was focused on an international negotiation, trying to serve our interest by using modern tools like these cap-and-trade and market mechanisms in that agreement. It was all focused internationally. And then we brought that deal back to the Congress and got creamed. The guy that led that negotiation, there was a big part of it -- in the Clinton White House is back and he is now the special envoy for the State Department as our lead climate negotiator, his name is Todd Stern, pretty smart fellow and also very pragmatic guy. And I think that lesson has been seared in his brain. And so our posture going forward internationally is that, we will agree to legally binding targets in the post Kyoto agreement, but those targets have to be consistent with our domestic policy and our domestic legislation.

So we're going -- we are reversing this, and we're going to get our domestic policy right, and reach a consensus here in America on what we're going to do, and how we're going to do it. And that will form the basis of our international position in Copenhagen and what comes after that. So that's the first part. We'll agree demanding mandatory targets, but it will be driven by our domestic policy making process, which we're engaged in right now. We will not agree to any new agreement without commitments by other major economies. Now I've been doing a fair amount of international work these days, and I'm learning that nuance matters in these international conversations. And there's an enormous amount of nuance here.

So – and people choose their words very carefully – so commitments by major economies like China could mean they accept a cap like we do, highly unlikely, because that means they can't grow. Or it could mean more possibly that they agree to specific reduction measures in their major sectors. So that's not a cap. It allows growth. And after all, who are we to tell China or India and other developing countries that, no, no you can't grow, you don't deserve the kind of quality of life we do after we've pumped a quarter of the greenhouse gases into the atmosphere, since the industrial age.

So we have to appreciate their ambitions. At the same time, we know the facts are that we are not going to get to where we need to go unless there's significant action by the developing world. So if I were in charge, I predict that Europe, North America, Japan and others will agree to some kind of cap that's driven by our domestic policy and that will demand significant action from the developing world and that would be the format -- and then as they develop and down the road, then we'd all be under some similar type of arrangement. And then there's also -- also huge debate and opportunities about offsets and forest protection and lot of incentives frankly for a major economy like Brazil to agree to specific reductions, because they will benefit from some of the offsetting ideas, emissions offsets are being talked about.

So I think it's going to be very interesting. It would be a big surprise to me if we had assigned comprehensive climate legislation by the time the major parties get together in Copenhagen to make an agreement. And it will be Todd Stearns' job to figure out how to proceed in that environment. But on the other hand it scares a lot of people in Congress that EPA is going to be off on its own doing rules. So that might be a strong enough incentive to get to yes in Congress, so that there is a greater certainty.
