

# BIOFUELS

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## HEARING BEFORE THE COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

TO

REVIEW THE U.S. DEPARTMENT OF ENERGY'S BIOFUEL PROGRAMS AND  
BIOFUEL INFRASTRUCTURE ISSUES, AND TO CONSIDER S. 187, THE  
BIOFUELS MARKET EXPANSION ACT OF 2011

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## BIOFUELS

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THURSDAY, APRIL 7, 2011

U.S. SENATE,  
COMMITTEE ON ENERGY AND NATURAL RESOURCES,  
*Washington, DC.*

The committee met, pursuant to notice, at 9:32 a.m. in room SD-366, Dirksen Senate Office Building, Hon. Jeff Bingaman, chairman, presiding.

### OPENING STATEMENT OF HON. JEFF BINGAMAN, U.S. SENATOR FROM NEW MEXICO

The CHAIRMAN. OK. Why don't we get started?

Today's hearing will discuss biofuels and the biofuel infrastructure issues. It's important that we consider those issues for two main reasons.

First, the unrest in the Middle East and associated high oil prices are a reminder of the cost of our reliance on foreign oil. Libya's oil production is shut in for the indefinite future. Oil prices might well remain high for some period here. These high oil prices and the resulting high gasoline prices endanger our national and global economic recovery. So it makes sense to be sure we're doing all we can to make our economy less vulnerable to dramatic changes in oil.

In my view the key to making our economy less vulnerable to oil price increases is to use less oil. Renewable biofuels are the best near term option for replacing oil in the transportation sector. Increased use of biofuels combined with fuel efficiency gains and increased domestic oil production have together reversed years of increasing dependence on imported oil and have actually lowered our petroleum imports.

We can go into those statistics. But that's a very good trend which I think we all need to acknowledge.

Second, the second reason why this is an appropriate time for this hearing is that even as we have a renewed sense of urgency to shift away from reliance on oil, renewable fuels are facing financing and infrastructure constraints that could prevent them from reaching their full production potential. The financing constraints are shared by many clean energy technologies and are not limited to renewable fuels.

Senator Murkowski and I authored a piece of legislation in the last Congress to address those policy challenges through the creation of a Clean Energy Deployment Administration. I hope the committee can focus again on that policy in the near future.

The infrastructure issues, however, are specific to the renewable fuels industry. We have maxxed out our capacity to absorb ethanol into our gasoline pool. This is true of traditional corn based ethanol, but also true of emerging cellulosic ethanol which is the advanced biofuel that is expected to be the first to enter the marketplace.

Cellulosic ethanol is made from woody biomass, from waste materials and grasses and the inedible parts of agricultural crops. Cellulosic ethanol does not compete with the food supply.

We have three broad options for continuing to replace oil consumption with renewable fuel consumption and staying on track to satisfy the requirements that we put in the 2007 Renewable Fuel Standard.

The first of those broad options is to increase the market for high level ethanol blends of 85 percent ethanol and 15 percent gasoline. That's E-85.

The second broad option would be to use ethanol in mid level blends higher than the current 10 or 15 percent ethanol, but still significantly less than 85 percent ethanol.

The third would be to move forward with renewable fuels other than ethanol.

Senator Harkin, who is here today to give us his views along with Senators Johnson and Franken and Klobuchar have helped to initiate the discussions on this topic with the introduction of S. 187, the Biofuels Market Expansion Act of 2007. 2011 it must be, right? S. 187 chooses the first of these options. That is maximizing the market penetration of E-85 through a mandate for cars and pumps that are compatible with E-85.

I'm concerned somewhat about the danger of over shooting the mark on maximizing E-85 infrastructure because I'm hoping that infrastructure compatible drop in fuels such as algae based biocrude and biobutanol would emerge to fill much of the renewable fuels requirement in the future. I know Senator Coons is very focused on this set of issues too and will be actively involved in the questions as we get into the hearing.

I'm not suggesting we can simply put our renewable fuels policy on hold while we wait for drop in fuels to come to market. As best we can tell right now ethanol from cellulose is likely to be the next renewable fuel to enter the marketplace. I note that the overwhelming majority of the grants and loan guarantees made by the Department of Energy and the Department of Agriculture have been for cellulosic ethanol. It seems to make sense that we would be working to ensure that there is a market for this cellulosic ethanol.

It's appropriate to explore a middle ground approach on this infrastructure issue. If ethanol can fuel more than 10 percent of our transportation needs in the near term than we should explore a path toward enabling it to do so. However, we should not go so far in locking our infrastructure into ethanol as the renewable fuel choice that we prevent different and perhaps even better renewable fuels from coming to market in the future.

There's obviously a balancing act here. These are complex issues which are going to require us to get the very best information we can before we take any action.

Senator Murkowski.

**STATEMENT OF HON. LISA MURKOWSKI, U.S. SENATOR  
FROM ALASKA**

Senator MURKOWSKI. Thank you, Mr. Chairman and welcome to Senator Harkin to the committee today.

I think that this hearing marks the first time that our committee has actually focused specifically on biofuels policies since some time mid of 2008 when we looked at the relationship between renewable fuels and food prices. Looking back I think it was probably a pretty optimistic time. It was a time when many policymakers thought that we had found both technologies and policies that would substantially reduce our Nation's oil consumption over a relatively brief period of time. But roughly 3 years later I think it's probably fair to say that some of the optimism surrounding biofuels has begun to ebb.

First generation biofuels have entered the market in significant quantities and at considerable cost to taxpayers. There's less agreement on the use of certain feed stocks. A coalition of some 90 groups, an unlikely alliance that includes members of the agriculture, environmental and business communities has emerged to oppose most, if not all Federal support for corn based ethanol. The optimism surrounding advanced biofuels, meanwhile, has both dimmed and shifted.

Congress' mandate for cellulosic biofuel required 100 million gallons last year but we saw very little production. This year the cellulosic standard ramps up to 250 million gallons. But again, barely any of that fuel will reach market. With time and technological developments many have begun to tout the drop in replacement fuels, as you know, Mr. Chairman, which promise to be more compatible with the existing infrastructure as the wave of the future.

We've reached a crossroads, I think, for our biofuel policies well before most of us expected to reach one. Nothing characterizes that crossroads better than the so called blend wall where ethanol production rises over 10 percent of our fuel supply. This could limit the overall use of ethanol. It could leave cellulosic production, one that begins in earnest, with no market at all. As we've seen with the recent A15 waiver there are no easy way out of this situation, only processes that we should seek to avoid in the future.

Now I hope that my comments this morning are not construed as anti-ethanol or anti-biofuel because that's clearly not my intention. I believe most certainly that biofuels have a definite and an ongoing place in our fuel supply. I make these observations simply to point out that our work in this area is just not finished.

We face a range of problems related to infrastructure, related to liability, other issues that could ultimately require legislation to address. Other committees are planning to revisit the RFS to make sure that it's working in Congress as intended. Given how the past few years have unfolded we should also recognize that it's possible that we may just be too aggressive.

I'm hopeful that today will mark the start of a larger conversation between all of the stakeholders that are affected by the biofuels policy. We should determine if there are ideas and if there are consensus on these ideas to help resolve the blend well prob-

lem, avoid retroactive fuel waivers and generally improve our biofuels policies. As part of that effort we'll need to pay close attention to the costs that would result from any new policy that's put forward.

We need to do our best to anticipate some of the unintended consequences that could arise. We will need to focus on all of the issues that are facing biofuels, not just some. We should be ready to admit that perhaps our previous policies have not always worked out as well as expected.

I look forward to the testimony that we will receive here this morning. Again, thank Senator Harkin, Senator Franken, so many, that are involved in this issue, for their input.

The CHAIRMAN. Thank you very much.

Our first witness today is Senator Harkin, who's been a leader on this set of issues for all the years that I've been here in the Senate. We very much welcome him and look forward to hearing your views on what we ought to do.

Go right ahead.

**STATEMENT OF HON. TOM HARKIN, U.S. SENATOR FROM IOWA**

Senator HARKIN. Thank you very much, Mr. Chairman and Senator Murkowski, members of the Energy and Natural Resources Committee. I appreciate the opportunity to provide my perspective on this issue of biofuels which I understand this is what this hearing is about.

You know, we constantly hear the refrain that we've got to reduce our oil imports. We've got to get off of imported oil. It's just a constant refrain all the time. To the extent where I think most people actually believe we have done nothing. We have just banging our heads against a wall. We've done nothing to reduce our oil imports.

I'm here today with a different message. We have made substantial progress in reducing oil imports. We can easily do more. I want to reemphasize, easily do more.

The greatest success in reducing our dependence on imported oil has come about through the advancement of biofuels, now totaling about 13 billion gallons per year or about 10 percent of our gasoline use in this country is now based in biofuels. Quite frankly that's happened in the last 10 years or put in another way the amount of ethanol or biofuels that we are using in America today is more than all of the gasoline used in Great Britain and France combined. More than all of the gasoline used in Great Britain and France combined, that's how much we're using right now in term of biofuels.

As I said, this has happened in 10 years. Think about that. We've reduced our dependence on imported oil by 10 percent in less than 10 years.

But most of this remarkable achievement has come about through actions of Congress, mostly from this committee, through the Renewable Fuels Standard of 2005 and what we called RFS-2 in 2007. So my message is not one of doom and gloom nor is it of idle hope. I think we can have optimism and confidence based not upon a will of a whisp or some ephemeral kinds of ghosts that we're chasing but based upon facts and accomplishments.



What have we done? what are the facts?

Well, OK, here we go.

This committee passed and the Congress passed the Renewable Fuels Standard saying that we're going to have 36 billion gallons of renewable fuels by 2022. Now we can achieve this and easily achieve this. I said we're at 13 right now. We've done that in literally 10 years.

But we need Federal policies to support biofuels expansion. Now one of those you mentioned the blend wall, the E10. We've been using 10 percent or gasohol as I've said, since the 60s, 70s.

Finally EPA, last year, and we met with them, a number of us. Senators met with them last fall. As you know they have now increased it to E15 that any car manufactured after 2001 can use 15 percent of ethanol blend without any problems whatsoever.

The problem before 2001 is they don't really have enough cars to test because most of those cars before 2001 already have 100,000 miles. So we don't know what's causing the problems. But, they've already proved E15. Quite frankly in our talks with them there's a belief that we can go to E20 without really any problems whatsoever, E20.

But the biggest challenge that we face in biofuels is what I call marketplace expansion. Senator Murkowski, you mentioned briefly about putting things in place that prohibit the development of other kinds of fuels. We kind of have that situation right now in the way that we have our cars manufactured and the way that we have our gasoline stations set up that really work against biofuels expansion.

So our bill, S. 187, does basically three things.

It provides a mandate on flex fuel cars. It has a phase in that all cars made in America, sold in America, have to be flexible fuel by a certain year. Again, we know that that costs less than \$100 a car, much less, if you do it on a mass production basis.

Or think of it this way, all of the cars, almost all the cars sold in the Brazil for the last dozen years have all been flex fuel. Ford, every car they make in Brazil does flexible fuel. General Motors, every car they make in Brazil is flexible fuel. Honda, Toyota, they're all flexible fuel. So there's no reason why we can't do that here.

So S. 187 basically phases in a requirement that cars sold in America have to be flexible fuel. When I mean flexible fuel that means they can burn at anything from gasoline to 85 percent ethanol. Brazil it's anything from gasoline to 100 percent ethanol.

The second requirement of S. 187 is to require blender pumps. That over a 6-year period of time that major oil companies, major gasoline stations would have to have at least one blender pump at a certain number of gas stations to the point where by 2020, 50 percent of all gasoline stations, one half of all gasoline stations would have at least one blender pump at that gasoline station.

I will relate to you a meeting that Senator Lugar and I had just a few years ago. We had called in the automobile companies. We had Chrysler there, Ford, General Motors. I think a representative of Honda was there. I forget who else.

We sat across the table from them and were asking them about why they aren't producing more flexible fuel cars. They said, well,

there's a lot of reasons. But the basic reason was why produce a flexible fuel car when there's no flex fuel out there. There are no stations out there. Why build them?

Literally, literally within a month after that we had, I remember we had, Texaco, Exxon, Shell, Mobil. We had a bunch of the major gasoline stations, companies, gas—oil companies in, Senator Lugar and I and there were some others there. We asked them why don't you put more blender pumps at your gasoline stations and their response was, you guessed it. Because there are no cars out there that can use this fuel.

So we have the chicken and egg situation. So the way to break that down is to have a phase in of both flexible fuel cars and blender pumps at the same time. So that as you make more flexible fuel cars, there are more blender pumps at the station. So those are two of the items in the bill.

It also, in our bill, provides grants. Obviously there are some small gasoline stations that people own just a few, maybe two or three or four, five, gasoline stations. We provide grants there for them to put in the tanks and the blender pumps.

The third part of the bill which is also vitally important is a loan guarantee for pipelines. A pipeline from places where they produce biofuels to the places where there are the most cars, like the east coast, for example. Already there are a couple of companies that have right of way and are prepared basically, to move ahead with a dedicated biofuels pipeline from the Midwest to basically New Jersey/New York City/Pennsylvania area.

But because of markets and because of the recession they haven't moved ahead. A loan guarantee, I think, would jump start that and get that pipeline built so that you could ship the biofuels to where most of the people are.

So those are basically the three things that are in S. 187. I might just add a couple of, three things, other.

We need to develop more cellulosic ethanol. That was mentioned, I think, by both Senator Bingaman and Senator Murkowski on cellulosic ethanol.

A few years ago we started on this. It showed great promise. Then the recession hit. A lot of the investments went down. But we've had some setbacks in that.

But I think we need to restart that effort and move ahead again on cellulosic ethanol. For the main reason is that—and we've had a number of experiments that I've been involved in for my role on the Agriculture Committee of using grasslands, using places of where you can go. Things like switch grass and things like that where you can harvest it annually. There's no erosion problems, either switch grass, miscanthus, things like that.

We've had experiments. We know we can grow that in areas where you're not really growing crops or anything else. But you can grow a lot of grass. You can harvest that every year for biofuels production. So we need to get that back on track.

One other issue that comes up is the issue of energy payback. A lot of critics say, well it takes more energy to make ethanol than you get out of it. I hope that's been put to rest.

We've had studies done by the Argon National Laboratory, the Department of Agriculture. That shows that that simply is not

true. That we basically can get up to just short, maybe twice the amount of energy out of a unit of ethanol than the energy that goes into it.

Which is reasonable when you think about it because most biofuels, ethanol, it takes sunshine and rain and soil. Those are renewable. So it doesn't take a lot of energy to produce the ethanol. I hope that's been put to bed.

It was mentioned about the drop in fuels, the biobutanols and the green gasolines. Again I think they have a lot of promise. But that's again, 20 years down the pike. We need to have continued research in it. But don't think that somehow we shouldn't do biofuels. We shouldn't do ethanol because we're going to have these drop in fuels.

Drop in fuels are not there. We can be researching that for the next 10, 20 years. I think we should. But it's not anywhere near being available like ethanol is right now.

Last, there was an article that came out this morning in the New York Times. I just saw it. It says, "Rush to use crops as fuel raises food prices and hunger fears."

Again, this is one of those—I don't know what you'd call it that just keeps coming up all the time in which there's just no basis in fact. We use mostly corn now to make ethanol in this country. Our corn exports are as much as they've ever been. The amount of corn we feed to chickens, hogs, and cattle and livestock is basically the same as it's ever been.

What's happened is we've increased the productivity. So the increased productivity, a lot of that has gone into ethanol and corn production. So it hasn't been that we're taking anything out of the food chain. We simply have increased the productive capacity of corn.

A lot of people don't know that the distiller's grain that is left over after you make ethanol is a good feed source for livestock. So you can still feed the cattle and still get the meat out of it. A lot of people think well that corn is the corn we eat. That's not the corn we eat. That's the corn you feed the chickens and cattle and hogs to produce meat that we consume.

So this, again, this story again, is just one of those things that keep coming up all the time that by using ethanol or biofuels we're going to have a lot of hungry people. That's just simply not so. But it just keeps coming up all the time.

I thank you for having me here this morning. I'll just close by saying that biofuels is and will continue to be our most important strategy to reduce dependence on imported oil if, I believe, we do the things that are outlined in S. 187, blender pumps, flex fuel cars and pipelines that can move this. With that, I think we can really, really move from a 10 percent to 20, to 30 percent reduction in our gasoline supplies in a very short period of time.

Thank you, Mr. Chairman.

[The prepared statement of Senator Harkin follows:]

PREPARED STATEMENT OF HON. TOM HARKIN, U.S. SENATOR FROM IOWA

Chairman Bingaman and Ranking Member Murkowski, thank you for holding this hearing and for inviting me to offer my views on the status and future of biofuels. I have supported the production and use of biofuels as a key strategy for

America for decades, so I welcome this opportunity to provide my current perspectives and recommendations.

We're all familiar with America's addiction to oil and our dangerous dependence on foreign oil. That message has been delivered countless times for decades, with powerful amplification every time oil prices rise. When those prices rise, we repeatedly decry the fact that we haven't solved this problem. Many think it's as though we're banging our heads against the wall, with no progress made nor any policy solutions in sight.

I'm here to offer a different perspective that recognizes our continuing challenges with respect to our addition to oil, but which also applauds some noteworthy successes. My message is that we've taken real steps to reduce our dependency on oil, and we have made substantial progress, but that there are also further steps within our reach.

The first thing we've done is to increase vehicle efficiency, and that has dramatically reduced our need for oil.

Even more remarkable, our biofuel production now totals about 13 billion gallons per year, and equals nearly 10 percent of our gasoline supply. While 10 percent might not sound too impressive, that is more than all the gasoline that Great Britain and France combined use in a year. Please think about that. For the first three decades that we bemoaned our oil dependency dilemma, no alternative fuels played any significant role in powering our cars and trucks. But over this past decade, contributions from ethanol and biodiesel have risen to nearly 10 percent of demand.

Given the size of our liquid fuels market, this is a remarkable accomplishment. Biofuels truly are working for us. Congress played a key role in this. In addition to the biofuels tax credits that we established in the 1970's, we also adopted the Renewable Fuel Standard in the 2005 energy bill, and we adopted a revised, more aggressive RFS2 in 2007 to put us on this trajectory.

So my message to your committee, Senator Bingaman, to the Congress, and to the American people, is not a message of doom and gloom about our continuing dependence on oil. Nor is it a message of idle hope. My message is one of optimism—optimism grounded in what we have done, and confidence that we can do much more. Our Renewable Fuel Standard calls for 36 billion gallons of biofuel by 2022. We can do that. We will do that. We must do that, and we must make sure that our federal biofuels policies' support this pace of biofuels expansion.

Success isn't a slam dunk. We have some major challenges. The biggest challenge is that our marketplace for transportation fuels is not yet equipped to absorb the increasing volumes of biofuels required by the Renewable Fuel Standard. This issue is especially acute for ethanol, which is the leading biofuel today, and which, despite real promise in other biofuels, will almost certainly remain the dominant biofuel for at least 2 more decades. Our problem is that nearly all of our ethanol is used in the form of E10, which is a 10 percent blend of ethanol with gasoline and which can be sold for use in all gasoline-powered vehicles. We use very little ethanol at higher blend levels, both because very few vehicles can legally use higher blends, and because such higher blends are available at very few refueling stations. With ethanol nearing 10 percent of our total gasoline supplies, we're facing what's called the "blend wall." This is a very serious limitation to expanding the use of ethanol. While the Environmental Protection Agency has announced that E15 will be approved for use in vehicles that are model year 2001 or newer, this only offers limited and temporary ethanol expansion potential.

I want to point out that even this marketplace limitation, from a longer-term perspective, is a clear sign of our success. Hitting this 10 percent blend wall is a result of that success! Ten years ago, when gasoline was essentially the only fuel, almost no one would have predicted this problem, that by 2011 we would be struggling with how to help an alternative to gasoline climb over a 10 percent barrier. However, with leadership in Congress, these challenges can be addressed. Thank you for including Senate bill S.187, the Biofuels Market Expansion Act of 2011, among the discussion topics for this hearing. I introduced this bill, along with Senators Johnson, Klobuchar, and Franken, on the very first legislative day of this Congress to highlight its importance. This measure consists of three main components.

- 1) The first is a requirement that a large majority of automobiles manufactured for sale in the United States be "flex-fuel" vehicles, meaning that they can utilize a wide range of ethanol blends, all the way from E0, straight gasoline, to E85. This is easy to do, and I've been told that it only costs about \$100 per vehicle, and possibly less. Almost all cars sold in Brazil have been flex-fuel vehicles for several years now.

- 2) The next provision expands the number of blender pumps that can provide higher blends of ethanol across the country. It does that by requiring that major

fuel distributors, those distributing the fuels sold at more than 50 refueling stations, install blender pumps at increasing numbers of their stations over a six-year period. It also authorizes grants for owners of smaller numbers of filling stations to install blender pumps that will dispense fuels with higher ethanol contents.

3) This bill also authorizes loan guarantees for the development of biofuel pipelines to move ethanol from its major production regions to other areas of the nation. There is already serious interest in building a pipeline from the Midwest to the New York harbor. But, investment commitments for such a large project require a loan guarantee because of the associated uncertainties and risks.

This Biofuels Market Expansion bill that you are looking at today is one way to address the marketplace and infrastructure challenges associated with supporting the further roll out of biofuels. There may well be better ways, different provisions that are more broadly acceptable while accomplishing the same purpose, and I look forward to working with your committee and our colleagues across the Senate in formulating and passing a bill. Indeed, many think we should revisit our whole federal policy framework for biofuels, including consideration of financial provisions such as the ethanol tax credits, and I agree with that. I understand that the ethanol industry intends to propose biofuels policy reform, including possible reductions in tax credits for ethanol coupled with provisions to support market expansion. I think that is commendable. I only wish that other industries would do the same—including the oil industry, which is getting very lucrative and unnecessary subsidies.

In addition to addressing the marketplace and infrastructure challenges that biofuels currently face, I'd also like to note the importance of accelerating the development and commercialization of cellulosic ethanol and other advanced biofuels. Frankly, about 3 or 4 years ago, advanced biofuel technology seemed to be poised to take off. Unfortunately, the fact that technologies were not quite ready, along with the financial meltdown that froze investments for new technologies, has cost us about 3 or 4 years. We now need to make sure that advanced biofuels' development and commercialization gets the federal support it needs in order to get back on a fast track.

I also want to take this opportunity to address the environmental charges that some have raised relative to ethanol. One question that continues to be raised has to do with the energy payback of ethanol. Authoritative analysis released last summer by the Department of Agriculture concludes that ethanol delivers about twice as much energy as is used in its production. That analysis takes into account the lower energy content of ethanol as well as the energy contents remaining in the main byproduct, the distillers grains that are used for livestock feed. We should also consider petroleum payback since a key benefit of biofuels is displacement of imported oil. Ethanol from corn actually delivers the equivalent of about 12 times as much energy as is contained in the petroleum used in its production.

As we consider alternative fuels, I agree that we should be examining their environmental impacts. In this regard, I would point out that we are using increasing amounts of fuels from tar sands, and surely we can all agree that the energy and water requirements for ethanol are far less than for those fuels.

There are also some who assert that corn ethanol is a mistake and that we should focus on "drop-in" fuels such as biobutanol or green gasoline. I agree that there is real promise and potential to drop-in fuels, and I wholeheartedly support their further development, but their widespread use and application is realistically decades away. I think it will be 20 years before they contribute 10 percent of our fuels, so that would be a 2-decade mistake. In the meantime, we are likely to see very substantial commercialization of cellulosic ethanol. By all means, we should continue apace with the development of drop-in fuels, but this is not an either-or proposition. Until drop-in fuels are commercially viable, we should continue to support ethanol.

Finally, some have expressed serious concerns about the impact of biofuels production on deforestation in developing countries. I understand that deforestation is a major contributor to increases in atmospheric greenhouse gases, and I fully support the need for controlling such land use changes. However, I believe the most effective way to limit environmentally destructive land-use change elsewhere is through land use policies. Limiting the development of biofuels in the United States seems to me a very uncertain and likely ineffective approach to reducing deforestation in Indonesia.

As one who has a strong environmental record and has authored or supported numerous conservation programs, I hope that our environmental groups revisit their prioritization of alternative, environmentally responsible strategies for America to

reduce our dependence on oil. In this real world of energy policy, a stance against ethanol may well be a stance in favor of tar sands oil.

Let me close by repeating my belief that biofuels have been—and will continue to be—our most important supply-side strategy for reducing dependence on imported oil. Those biofuels lower transportation fuel costs by increasing fuel supplies, and that saves us money at the pump, as well as reducing our dependence on foreign oil. Biofuels also are cleaner today than gasoline, by any measure, and their environmental impacts are steadily declining as we improve efficiencies and reduce emissions in our biorefineries. We should be pleased with our record with ethanol and biofuels. We definitely should enable their expanding contributions to resolving our most critical energy problem.

Senator Bingaman and Senator Murkowski, I congratulate you and your committee members for your leadership on charting strategies for addressing our oil problem. Thank you for this very timely consideration of our national biofuels policy issues. You led the formulation and passage of the renewable fuel standards that set the trajectory for biofuel contributions. We should all celebrate that success, and we must stay on that course. Thank you for inviting me to testify today on a subject that I consider to be so vital to our future energy economy, and I look forward to working with you and our colleagues across the Senate on reforming federal biofuels policy to assure their continuing and expanding contributions to our transportation fuel supplies.

The CHAIRMAN. Thank you very much. I appreciate your testimony. I'm sure we will have a great opportunity to discuss this with you more as the weeks go on here through the session.

Why don't we go ahead with our first panel of witnesses? I know that I was informed Senator Shaheen wanted to introduce Mr. Brady. So why don't you go ahead with that at this time if you want. I'll introduce the other three.

Senator SHAHEEN. Thank you very much, Mr. Chairman. Welcome to all of our panelists this morning. I'm really delighted. I should probably share this introduction a little bit with Senator Stabenow.

But we have Bill Brady here, who is the CEO of Mascoma Corporation which is a New Hampshire based corporation that is about to build a facility in Michigan. We would rather have it in New Hampshire. But we're delighted we're expanding. You're expanding. We hope that goes forward as planned.

Mascoma and the effort that Bill is leading is a facility that has developed cellulosic ethanol from research that was done at Dartmouth. It's, I think cutting edge research, really on the cutting edge globally for the research that they're doing on cellulosic ethanol. I've had the opportunity to visit the facility up in Lebanon and Hanover, New Hampshire. It's very impressive to see the growth that you have benefited from and to see the research that's going on there.

So we're delighted to have you here and to be able to question you about some of the challenges that you face. Hopefully we can put in place some policies to continue to benefit the work that you're doing.

Thank you very much for being here, Mr. Brady.

The CHAIRMAN. Alright. Let me before we hear from you, Mr. Brady, let me introduce our other three panel members.

Mr. Shane Karr, who is the Vice President for Federal Affairs with the alliance of Automobile Manufacturers. We appreciate you being here.

Bob Dinneen, who is President and CEO of the Renewable Fuels Association. We're glad to have you back before the committee.

Mr. John Eichberger, who is the Vice President of Government Relations with the National Association of Convenience Stores. Thank you for being here.

Why don't we just have each of you take five or 6 minutes and give us the main points that you think we should understand. We will include your full statements in the record as if read.

Mr. Brady, why don't you go ahead?

**STATEMENT OF BILL BRADY, CEO, MASCOMA CORPORATION,  
LEBANON, NH**

Mr. BRADY. Thank you. Thank you very much, Senator Shaheen. Thank you, Mr. Chairman, Senator Murkowski and members of the committee. It's my honor to be here today.

Senator Shaheen did a terrific job introducing the company. We do have our headquarters in the great State of New Hampshire. We have a pilot facility, a 300,000 gallon pilot facility in/near Syracuse, New York. We are indeed planning a 40 million gallon commercial scale production facility in Kinross, Michigan, in the upper peninsula of Michigan.

The \$350 million Kinross project which we call Frontier Renewable Resources is being developed in conjunction with a Michigan based timber company called, J.M. Longyear, 120 year old timber company. We will make 40 million gallons of cellulosic ethanol. The construction will employ 150 people. Once operational there will be 70 skilled jobs in the facility and the State of Michigan estimates spin off jobs on the order of 700.

In the past year we've made significant progress.

On the technology front, ethanol produced at that plant will be competitive with oil at \$75 per barrel and will be competitive on a cash cost basis with corn ethanol today.

On the financial and supply chain front Valero Energy Corporation has invested in Mascoma and will be partnering with us both on taking the off take from the facility and providing equity.

We also have a pending loan guarantee application under consideration at the Department of Energy.

So we've made considerable progress. We do need the government's help to get the project moving. I'll outline that in a second. But before I do I want to make it clear. Our job and our commitment is to continue to drive down the costs, advance the technology and make this technology competitive. We're committed to doing that.

On the government front. The companies like mine have made good progress because we have been backed by venture companies and strategic investors. What's needed now is a significant capital investment to build the production facilities.

Venture capital firms don't provide that type of capital. Most private equity firms want to see it working before they'll put considerable money to work and debt providers simply won't take that risk or the cost will be much too high. This is the so called Valley of Death that I think you hear about with new companies between where we are now and building the first facilities.

So here's how the government can help.

First, Congress must maintain the DOE's authority and funding to provide renewable energy loan guarantees. Concepts like Chair-

man Bingaman's CEDA proposal holds great promise for the future. But today the DOE Loan Guarantee Program is the best choice and the best bet for companies like ours. Eliminating the program will delay projects and make it very, very difficult for us to raise funds.

Second, the market signals for cellulosic ethanol provided by the RFS-2 and by the PTC or Production Tax Credit are critical. Efforts to weaken the RFS 16 billion gallons must be avoided. The existing PTC or Production Tax Credit is scheduled to expire in 2012. This is vital to our first plant financials. Ideally our industry would like to see long term, 10 year, production tax incentives. But engaging in this yearly extenders game does not give investors confidence that it will be there for them.

Then third, the U.S. needs to make significant progress in breaking through the blend wall. I think Senator Harkin spoke about this. We need to create some space for cellulosic fuels.

The investors are very aware of this blend wall and its limitations and what they basically want to see, what we all want to see, is infrastructure policy on FFVs and on blender pumps that equal the RFS-2 gallons or that support the RFS-2 gallons. So a robust commitment to FFVs is necessary and critical. We know this technology is here and is relatively inexpensive.

Efforts also need to focus on blender pumps. I think we need Federal mechanisms to significantly increase the speed of installation of blender pumps. I commend Senator Harkin's efforts to address these issues in S. 187.

So my final message is the time is now. The technologies are ready. Unfortunately the Valley is before us. The market signals are less than clear.

We spend as a country, \$560 billion per year on imported oil. I think a long weekend of that spending would go a long way to moving this industry forward quickly. It will help this country in what we so badly need in our energy independence and economic security.

So I thank you for holding this hearing. I thank you very much for having me here today.

[The prepared statement of Mr. Brady follows:]

PREPARED STATEMENT OF BILL BRADY, CEO, MASCOMA CORPORATION

Good morning, Mr. Chairman and members of the committee. My name is Bill Brady, CEO of Mascoma Corporation and Chairman of the Advanced Ethanol Council, a group of companies leading the development and commercialization of advanced ethanol technologies.

Mascoma is an innovative biofuels company committed to developing environmentally sustainable, low cost, low carbon biofuels from cellulosic biomass. The company's corporate office and R&D laboratories are based in Lebanon, New Hampshire. Mascoma is producing cellulosic ethanol at a 300,000 gallon demonstration scale at its facility in Rome, New York. We are also developing a 40 million gallon per year commercial scale project in Kinross, Michigan. Our hope is to begin construction on this facility this fall pending achievement of several milestones, some of which I will discuss today.

BACKGROUND ON MASCOMA'S TECHNOLOGY AND RESEARCH AND DEMONSTRATION FACILITIES

Mascoma's Consolidated BioProcessing method converts non-food biomass feedstocks into cellulosic ethanol through a patented process that eliminates the need for costly enzymes and additives. This transformative technology enables ethanol



competitively priced with gasoline to be derived from cellulose in a manner not previously possible. The processing steps involve:

1. Selective harvesting of pulpwood.
2. Chipping of excess pulpwood (the feedstock we are using in our first plant).
3. Pretreating the feedstock by cooking and processing the wood chips into a softened material similar to peat moss.
4. Combining the pretreated material with proprietary microorganisms in a fermenter, and fermenting the cellulose into ethanol.
5. Recovering ethanol and lignin from the process. Cellulosic ethanol is blended with gasoline as a low carbon motor fuel. The unconverted fiber, called lignin, is used as a low carbon boiler fuel or converted into other non-ethanol fuels.

Mascoma's aim is to develop the lowest cost technology to convert cellulose materials into ethanol that we will, in turn, use in commercial scale ethanol facilities in rural America that will create new economic opportunities for local feedstock providers, create jobs, and lessen our dependence on foreign oil.

At our labs in Lebanon, New Hampshire our team of 60 scientists are continuing to make significant advances in our CBP process by improving upon our advanced biocatalysts for the cost effective conversion of cellulosic biomass into ethanol.

Our demonstration facility in Rome, New York has been in operation since the fall of 2008. It is here that our integrated team of scientists, engineers, and experience plant operators validate the organisms we have developed in Lebanon at large scale. It is also where new process technologies are implemented before being included in our designs for our commercial facility.

Mascoma has been fortunate to have received grant funding from the Department of Energy to augment private equity in our research and demonstration activities in Lebanon and Rome. I thank the Committee for its leadership in providing DOE with this important authority.

#### EFFORTS UNDERWAY TO DEVELOP FIRST COMMERCIAL FACILITY

Mascoma, in conjunction with J.M. Longyear, a Michigan-based natural resource management company that is certified under the Forest Stewardship Council, is actively developing the first commercial scale production facility through its affiliate Frontier Renewable Resources in Kinross, Michigan. The facility will use sustainable, lower-value wood products such as pulpwood to produce 40 million gallons of cellulosic ethanol per year.

The \$350 million Kinross biorefinery will be located in a rural area in the Upper Peninsula of Michigan. The plant will be constructed on a site near a decommissioned U.S. Air Force base. The facility is strategically located in close proximity to approximately 8.3 million acres of timberlands. Annual growth in these forests exceeds harvest by 1.8 million tons annually and the Kinross facility could double its expected production levels and the area would still have an annual surplus of growth. Beyond this, a recent analysis by Michigan Technological University found that the Kinross facility will reduce greenhouse gas emissions by 108% compared to gasoline.

The construction and operation of a cellulosic ethanol plant in this area will create jobs and develop demand for underutilized regional hardwood timber resources, providing support for the local economy. It will employ 150 people during construction. Once operational, the plant will employ 70 highly skilled people, and create 700 spin off jobs in the region according to estimates by the state of Michigan.

In the past year, we have made substantial strides in developing the Kinross site in regards to technology development, supply chain development and securing additional financing. On the technology front, cellulosic ethanol produced at our Kinross facility will be competitive with oil at \$75 per barrel. In addition, we will be competitive with corn ethanol today when compared on a cash cost basis. On the financing and supply chain front, we announced, in January, that Valero Energy Corporation invested in Mascoma and will be partnering with us in the Frontier project. Additionally, we have a pending loan guarantee application under consideration at the Department of Energy.

We have made considerable progress. However, we know we need to continue to drive down our costs to make cellulosic ethanol even more competitive in the marketplace. This is our job and our commitment. We will also need strong continued and consistent federal policies to help us reach our goal of breaking ground in 2011 and beginning operations in 2013.

## NEED FOR CONTINUING ROLE OF THE FEDERAL GOVERNMENT

Advanced and cellulosic ethanol companies like Mascoma have made significant progress in recent years in large part because of backing of venture and strategic investors. Our technologies are well developed and proven at demonstration scale. What is needed is a significant capital infusion to scale up to full commercial operation. Venture capital firms do not provide this type of financing. Most private equity firms want to see that the technology works before they will commit large scale funding. Debt providers either won't engage because of risk or set the cost of debt too high in comparison to relevant risk. While companies like mine have been able to secure investments from strategic investors, a delta still exists. This is the so-called "valley of death."

It is during this critical time that clear signals must be sent to the marketplace about the Federal government's commitment to advanced biofuels. As we move forward in our discussions with investors, there are three critical areas where the Federal government needs to provide consistency.

First, Congress must maintain DOE's authority and funding to provide renewable energy loan guarantees. To cross the valley and start construction of projects in 2011, this loan guarantee authority represents the best available tool for many projects. Last week, 34 CEOs with loan guarantees pending at DOE sent a letter highlighting that their projects represent an additional \$24 billion in near-term investment in America's energy infrastructure and would put another 35,000 Americans to work. Additionally, seven leading trade associations representing, biofuels, biomass, wind, solar, and geothermal interests also sent a letter highlighting support for the program last week. With high crude oil and gasoline prices and a RFS2 mandate calling for significantly more gallons of cellulosic biofuels, now is not the time to eliminate this program. It will delay projects and undermine confidence in the investment community.

Second, the market signals for cellulosic ethanol provided by the RFS2 and the cellulosic biofuels production tax credit must be maintained. The RFS2's call for 36 billion gallons of renewable fuels including 16 billion gallons of cellulosic biofuels including the cellulosic waiver credit pricing mechanism are extremely important. Efforts to weaken this commitment must be avoided. In addition, the existing cellulosic biofuels production tax credit (PTC) is important to our financials in the near term as our capital and production costs continue to decline. The existing PTC is set to expire at the end of 2012. Ideally, our industry would like to see long-term (10 year) tax incentives for advanced and cellulosic biofuels. Engaging in a yearly extenders game surrounding the cellulosic biofuels production tax credit will not provide the kind of consistent market signal that investors are looking for when making decisions in this industry. As you can imagine, incentives that expire before a facility is placed in service are very hard to market to investors. Well developed projects that break ground this year will likely not be in production until 2013. A one year extension of tax incentives that expire in 2011 or 2012 do not provide the type of certainty investors are looking for when making investment decisions.

Third, the United States needs to make significant progress in breaking through the existing ethanol blend wall to ensure sufficient head room in the fuel marketplace for advanced and cellulosic ethanol. Investors are very aware of the limitations of the existing blend wall. While EPA, with the support of DOE and other agencies, have spent significant time working to approve increased ethanol blends in the existing automobile fleet from E10 to E15, focus needs to shift to removing infrastructure hurdles preventing the use of even higher ethanol blends in the future.

In 2007, GM, Ford, and DaimlerChrysler committed to increasing production of FFVs to 50% by 2012 conditioned on having sufficient E85 refueling infrastructure to meet this demand. While this was an important step forward, pledges and incremental progress help only to a degree. A robust commitment to FFVs is necessary to unlock the potential of advanced and cellulosic ethanol and provide investors with the certainty they need. Besides producing vehicles that are capable of running on high ethanol blends, efforts need to be focused on installing blender pumps that can handle higher ethanol blends in our country's approximately 180,000 gas stations. Today, there are only approximately 2,300 E85 pumps (up from 1,200 in 2007) at those 180,000 stations. Addressing vehicles and pumps are essential to improving the investment climate and ensuring sufficient consumer demand for advanced and cellulosic ethanol. I commend Senator Harkin's efforts to address these issues in S. 187, the Biofuels Market Expansion Act of 2011 and thank the committee for holding this hearing on this critical issue.

## CONCLUSION

The time is now for the United States to make significant strides in the commercialization of advanced and cellulosic ethanol. The technologies are ready. Unfortunately, the valley is before us, and the market signals that will help drive investment are less than clear. High oil prices are not only driving up gasoline prices at the pump, but the costs of goods and services across the entire economy. The U.S. is spending \$560 billion annually to import foreign sources of oil which make up 60 percent of our total oil requirements. In 2008, the price spike in the gasoline market cost the United States nearly \$1 trillion. It would be far better to invest funds to build out the advanced and cellulosic ethanol infrastructure that our country so badly needs for our energy security and economic well-being.

Putting in place a consistent, long-term federal policy for advanced and cellulosic biofuels including significant focus on higher-blend ethanol infrastructure and FFVs is critical to continued development in the United States and its ability to continue to keep pace with clean energy investments of other countries.

Thank you.

The CHAIRMAN. Thank you very much.

Mr. Karr, go right ahead, please.

**STATEMENT OF SHANE KARR, VICE PRESIDENT FOR FEDERAL AFFAIRS, ALLIANCE OF AUTOMOBILE MANUFACTURERS**

Mr. KARR. Thank you, Chairman Bingaman, Senator Murkowski and members of the committee. I appreciate the opportunity to be here today representing the Alliance of Automobile Manufacturers, a trade association of 12 car and light truck manufacturers, who together account for nearly 80 percent of annual motor vehicle sales in the United States.

Auto manufacturing is a cornerstone of the U.S. economy. Indeed we're the largest remaining manufacturing sector in the U.S. economy.

Our sector accounts for more than 4 percent of gross domestic product.

Supports eight million private sector jobs, \$500 billion in annual compensation, and \$70 billion in personal income tax revenues.

On behalf of the Alliance I appreciate the opportunity to offer our views on the role biofuels can play in helping address our Nation's energy security and environmental concerns.

Auto makers are fully engaged in development of vehicles in advanced technologies to help reduce gasoline consumption and emissions including carbon emissions. Today consumers can choose from more than 160 models that get over 30 miles per gallon. We're working on a variety of additional technologies that will also dramatically reduce gasoline consumption.

However, there's no single—there's no silver bullet or single technology that will solve the challenges of enhancing energy security and reducing greenhouse gas emissions. Therefore, we strongly believe that any legislation mandating a particular technology is a step in the wrong direction for our Nation's energy policy. So let me say first and clearly, auto makers support biofuels and continue to believe they are an important component of a national strategy to lessen our dependence on foreign oil.

Several of my member companies are direct investors in conventional and advanced biofuel companies. We also support flexible fuel technology and are manufacturing flexible fuel vehicles faster than the fueling infrastructure can keep up. In fact there are already more than 8.2 million FFVs on U.S. roads. Yet less than 2

percent of gas stations have an alternative fuel pump and most are concentrated in the Midwest which makes sense because that's where most ethanol is produced.

But even in states where E85 pumps are concentrated, actual sale of E85 has been stagnant. For example, in 2008 which is the last year for which we have complete data, Minnesota had more stations than any other State in the country, 364 with an E85 pump. But on average, FFVs in that State use less than one full tank of E85 for the whole year.

The data suggests that widespread market penetration of biofuels is not as simple as it is sometimes portrayed. FFVs will continue to be an important vehicle technology. But their effectiveness in helping to reduce U.S. oil consumption is a function of fuel price and availability and consumer's willingness to use the fuel.

So S. 187 calls for 90 percent of vehicles to be FFVs beginning in model year 2016 and 90 percent mandate would cost consumers more than \$2 billion per year to purchase FFVs which is a significant tax if consumers have little or no access to the alternative fuels or little incentive to use them. But for manufacturers there's also a large opportunity cost with this plan. Hundreds of millions of dollars annually that we could be applying to other fuel saving technologies would be diverted to one single technology that would result in oil savings and emissions reductions only if consumers actually use the biofuels in significant quantities.

So while auto makers oppose FFV mandates we recognize the need for pragmatic policies to address expanding production of biofuels under the RFS. Our industry has a vision for how we could work together to ensure that our Nation's passenger vehicle fleet and our national fuel pool remain compatible as we transition to greater use of renewable fuels. For our part, auto makers would commit to a dialog with Congress and the appropriate Federal agencies to discuss making our future light duty vehicles capable of running on gasoline alcohol blends at a higher level than what is available today at E10 for model years beyond the established timeframe.

The availability of the new fuel should coincide with the availability of vehicles that can run on the new fuel. So we have a market for both. In order to ensure successful implementation we would work closely with other stakeholders to determine the right level and timeframe. We would propose government policies where necessary to safeguard consumer access to the fuels.

Some key considerations in a transition like this would include:

Maintaining a high octane level since ethanol provides less energy per gallon than gasoline, it would be important that the future fuel would provide higher octane which would allow us to minimize fuel economy decreases and corresponding increases in greenhouse gas emissions.

Legacy fuels. Legacy fuels would have to continue to be available for older vehicles and other small engines while the refueling infrastructure for higher level ethanol blends is transitioning. Likewise we would need to take serious steps to ensure that we don't have widespread mis-fueling.

Finally liability protection because we know some mis-fueling is likely to occur despite our best efforts. Appropriate consideration

should be given for some liability protection for auto makers and fuel providers.

This approach that I've outlined would give auto makers the lead time required and the certainty needed to design and develop vehicles that can best meet the multitude of requirements placed on us by our regulators and the expectations of our customers. It should also provide a clear path for producers, retailers, engine manufacturers and other stakeholders. With certainty about the fuels our vehicles will be using our engineers can design vehicles that are optimized for these fuels. This will allow us to deliver better fuel economy, better performance and more cost effective compliance with the mission standards which in turn improves the value proposition for our customers.

Thank you for the opportunity to testify. I would be happy to answer any questions.

[The prepared statement of Mr. Karr follows:]

PREPARED STATEMENT OF SHANE KARR, VICE PRESIDENT, FEDERAL GOVERNMENT AFFAIRS, THE ALLIANCE OF AUTOMOBILE MANUFACTURERS

Thank you, Chairman Bingaman, Ranking Member Murkowski and members of the Committee. My name is Shane Karr and I am Vice President for Federal Government Affairs at the Alliance of Automobile Manufacturers (Alliance). The Alliance is a trade association of twelve car and light truck manufacturers including BMW Group, Chrysler Group LLC, Ford Motor Company, General Motors Company, Jaguar Land Rover, Mazda, Mercedes-Benz, Mitsubishi Motors, Porsche Cars, Toyota Motors, Volkswagen Group and Volvo Cars. Together, Alliance members account for nearly 80 percent of annual motor vehicle sales in the U.S. Auto manufacturing is a cornerstone of the U.S. economy, supporting 8 million private-sector jobs, \$500 billion in annual compensation, and \$70 billion in personal income tax revenues. On behalf of the Alliance, I appreciate the opportunity to offer our views on the role biofuels can play in helping address our nation's energy security and environmental concerns.

Automakers are fully engaged in development of vehicles and advanced technologies to help reduce gasoline consumption and emissions, including carbon emissions. Today, consumers can choose from more than 160 models that get over 30 miles per gallon—and we are working on a variety of additional technologies that will also dramatically reduce gasoline consumption. However, there is no silver bullet or single technology that will solve the challenges of enhancing energy security and reducing greenhouse gas emissions. Therefore, we strongly believe that any legislation mandating a particular vehicle technology is a step in the wrong direction for our nation's energy policy.

Automakers support flexible fuel technology and are manufacturing flexible fuel vehicles (FFVs) faster than the fueling infrastructure can keep up. In fact, there are already more than 8.2 million FFVs on U.S. roads, yet less than 2 percent of gas stations have an alternative fuel pump, and most are concentrated in the Midwest, where most ethanol is produced. The GAO predicts that federal fleet alternative fuel usage requirements are unlikely to be met in the foreseeable future "because of limited availability of alternative fuel." But even in states where E85 pumps are concentrated, actual sale of E85 has been stagnant. For example, in 2008 (the last year for which complete data is available), Minnesota had 364 stations with an E85 pump, but on average, FFVs in the state used less than one full tank of E85 each for the whole year. The data suggests that widespread market penetration of biofuels is not as simple as it is sometimes portrayed. FFVs will likely continue to be an important vehicle technology, but their effectiveness in helping to reduce U.S. oil consumption is a function of fuel price and availability and consumers' willingness to use it.

S. 187 calls for 90 percent of vehicles to be FFVs beginning in model year 2016. At costs of \$100-\$300 per vehicle, a 90 percent mandate would cost consumers more than \$2 billion per year to purchase FFVs (if fully passed through), even though consumers will have little or no access to alternative fuels. Therefore, such a mandate is essentially a tax with little consumer benefit. There is also a large opportunity cost with such a plan. Hundreds of millions of dollars annually that could be applied to other fuel saving technologies would be diverted to one technology.

Without companion fuel use, the overall GHG and oil consumption reductions from an FFV mandate would be marginal and possibly less impactful than other technology applications.

The cost of making vehicles flex fuel capable is also expected to increase in the next few years as smog-forming emissions requirements are tightened. Today's FFVs do not comply with the most stringent state emissions standards and testing requirements. California has indicated it will require virtually all vehicles to certify to the most stringent standard in the coming years under LEV III, and the federal government is likely to follow suit under Tier 3. It is not clear that future FFVs may be engineered to meet these regulations at an affordable cost for consumers.

All of this said, automakers continue to believe that renewable fuels are an important component of our national strategy to lessen our dependence on foreign oil. Our industry also understands that calls for FFV mandates are largely motivated by the requirements of the Renewable Fuel Standard (RFS) to greatly increase the amount of ethanol and other biofuels in the national fuel mix.

While our industry opposes FFV mandates for all of the reasons I have previously noted, we recognize the need for pragmatic policies to address expanding production of biofuels under the RFS. We know the auto industry has a role to play in helping to make the RFS a success.

The question is: What combination of fuel-related and auto-related policies will best facilitate that goal? FFV mandates that fail to align the vehicle population with the fuel available in the marketplace are not the answer. The pressing need going forward—for automakers, for fuel providers, and for American consumers—is to ensure that our nation's passenger vehicle fleet and our national fuel pool remain compatible as we transition to greater use of renewable fuels. Our industry has a vision for how we can work together prospectively with policymakers and fuel providers to accomplish that goal.

For our part, automakers would commit to a dialog with Congress and the appropriate federal agencies to discuss making our future light duty vehicles capable of running on gasoline/alcohol blends at a level higher than what is available today at E10, for model years beyond an established timeframe. The availability of the new fuel should coincide with the availability of the vehicles that can run on the new fuel, so there is a market for both. Such a prospective approach is a far preferable alternative to the use of E15 in MY 2001 and newer vehicles, which are not designed, certified or warranted to run on greater than 10% volume ethanol blends.

In order to ensure a successful implementation, we would work closely with other stakeholders to determine the right level and to identify and propose government policies to safeguard consumer access to the fuels needed to maintain vehicle performance, reliability, and refueling convenience. Some key considerations in such a transition include:

- **Octane Level:** Since ethanol provides less energy per gallon than gasoline, the future fuel may need to provide higher octane—to minimize fuel economy decreases and corresponding increases in greenhouse gas emissions—as more ethanol is added to gasoline. This change may be crucial for consumer acceptance. It is also critical that automakers not be penalized under future regulations for any decreases in fuel economy that are attributable to greater ethanol use.
- **Legacy Fuels—Misfueling:** Legacy fuels must continue to be available for older vehicles while the refueling infrastructure for higher level ethanol blends is transitioning. Government assistance in implementing an effective program to educate consumers about the fueling capabilities of their vehicles to prevent misfueling will also be crucial to the success of the effort. In addition, enforcement of fuel blend and labeling requirements must be extensively and effectively executed.
- **Liability Protection:** Because some misfueling is likely to occur despite the best efforts of regulators, automakers and fuel providers, consideration should be given for appropriate liability protection that would stem from misfueling.

The approach I have outlined here provides a strong path forward to helping to meet our energy security goals. By taking a responsible, prospective approach, for both the vehicles and the fuels, we can avoid the problems that have undermined the ability of E85 to make a meaningful contribution to date and the problems likely posed by using E-15 in older vehicles not designed for such fuels.

Above all, this approach would give automakers the lead-time required and establish the certainty needed to design and develop vehicles that can best meet the multitude of requirements placed on us by regulators, and by consumers. It should also provide a clear path for producers, retailers, engine manufacturers and other stakeholders. With certainty about the fuels our vehicles will be using, our engineers can design vehicles that are optimized for these fuels. This will allow us to deliver better

fuel economy, better performance, and more cost-effective compliance with emissions standards—which in turn improves the value proposition for our customers.

The CHAIRMAN. Thank you very much.  
Mr. Dinneen, go right ahead.

**STATEMENT OF BOB DINNEEN, PRESIDENT AND CEO,  
RENEWABLE FUELS ASSOCIATION**

Mr. DINNEEN. Thank you, Mr. Chairman. Good morning, Chairman Bingaman, Senator Murkowski, members of the committee. My name is Bob Dinneen. I'm the President of the Renewable Fuels Association.

This is an important and timely hearing. I would echo Senator Harkin's comments that because of the vision of this committee in the passage of the energy bill in 2007. That bill put our Nation on a path toward greater energy diversity and national security through an expanded renewable fuel standard.

That has stimulated unprecedented investment in the U.S. ethanol biofuels industry. As a consequence with more than 13 billion gallons of production, the U.S. now leads the world in the production and use of clean, renewable, domestic liquid transportation fuels. Consider the progress that has been made as a consequence of that bill.

Today ethanol is blended into roughly 90 percent of the gasoline sold in this country. In 2010 ethanol production contributed \$53 billion to the national gross domestic product and added \$36 billion to household income.

Ethanol production has meant jobs to this country. 70,000 Americans are employed directly in the production of ethanol and in the industries providing goods and services. But the economic activity generated by ethanol production supports a total of more than 400,000 jobs across this country.

Domestic ethanol production improves our Nation's balance of trade while also reducing our reliance on foreign oil. The production of 13 billion gallons of ethanol means that the U.S. needed to import 445 million fewer barrels of oil in 2010 to refine gasoline. That is more oil than the U.S. imports from Saudi Arabia. Displacing these imported oil barrels saved the U.S. more than \$34 billion last year.

But finally at a time when American consumers are faced, once again, with skyrocketing gasoline prices, ethanol is helping to hold the price of gasoline lower at the pump. Economists estimate that increased ethanol blending has reduced the price of gasoline from 15 to 50 cents a gallon. For the average American driver that's an annual savings of \$120 to \$400 each year. Those savings result not just from the fact that ethanol has been priced 50 cents to a dollar less than gasoline over the last several years, but also because 13 billion gallons is reducing the net amount of oil that we have to import and use.

But for the energy bill 2007 to reach its ultimate goal of 36 billion gallons of renewable fuels additional Federal efforts to open markets, stimulate investments in new technologies and assist in the development of infrastructure for these new fuels will absolutely be necessary. Without question moving beyond 10 percent ethanol blends is essential to meeting the 36 billion gallon RFS.

Importantly cellulosic and advanced ethanol will largely represent the renewable fuel supply beyond E10. To leave the blend market artificially constrained further limits the market opportunities for next generation biofuels that are so very close to commercialization today. That's why E15 is so important.

But in addition to expanding the ethanol blend market it is going to be critical to the future growth of cellulosic and advanced ethanol to promote ethanol's important role as an alternative fuel as well. Currently, as Shane indicated, the E85 market represents just a fraction of the overall U.S. ethanol market. But it's growing.

We estimate that there are about eight and a half billion flex fuel vehicles on American roads today. That's up significantly from recent years and is a testament to the leadership of General Motors and Ford and Chrysler. But it still represents just 3 percent of the total automotive fleet. We need more flex fuel vehicles.

I was greatly encouraged by the comments a moment ago from the Alliance of Automobile Manufacturers recognizing the need to move our passenger vehicles beyond E10 is a big step. I welcome the offer of a dialog to discuss the most appropriate blend level and timeframe. I would encourage this committee, however, that this dialog should happen expeditiously because with each passing day America's energy crisis grows ever worse.

Mr. Brady has articulated quite well the challenges of financial investment in second generation technologies. But I will merely underscore that if the volume of advanced biofuels envisioned by the energy bill are to be realized in the infrastructure to support them, the Department of Energy's Loan Guarantee Program must be more effectively implemented. Federal funding to this program should be restored.

Now addressing the infrastructure needs of America's renewable fuels policy cannot be based on a wish list. It must be grounded in sound analysis. The RFA has released a study on how future requirements of the RFS can be met if the right commitments are made to ensure a steady evolution of refueling infrastructure and the automotive fleet.

In short, blender pumps will need to be installed at a minimum of 53,000 service stations. This represents roughly 33 percent of service stations across the country. Efforts to install blender pumps should focus on areas with the highest levels of vehicle miles traveled throughout the country.

Many of the challenges I've discussed are addressed by S. 187. The RFA supports that legislation. At a minimum Federal policies should maintain and extend existing tax incentives for higher ethanol blends to allow for the continued growth of these fuels, expand tax incentives for refueling infrastructure and create new consumer based incentives to encourage the purchase of FFVs.

The RFA supports legislative action to require a percentage of new vehicles sold in the U.S. be FFVs. Further the RFA supports legislation requiring the installation of higher level ethanol blends refueling infrastructure. But there may be many ways to accomplish these goals. We want to work with this committee and all stakeholders to accomplish that.



Mr. Chairman, thank you for your continued leadership. I look forward to working with you and the rest of the committee in the coming months to move this country's energy future forward.

[The prepared statement of Mr. Dinneen follows:]

PREPARED STATEMENT OF BOB DINNEEN, PRESIDENT & CEO, RENEWABLE FUELS ASSOCIATION

Good morning, Chairman Bingaman, Ranking Member Murkowski, and Members of the Committee. My name is Bob Dinneen and I am president and CEO of the Renewable Fuels Association (RFA), the national trade association representing the U.S. ethanol industry.

RFA is the leading trade association for America's ethanol industry. Its mission is to advance the development, production, and use of fuel ethanol and co-products by strengthening America's ethanol industry and raising awareness about the benefits of renewable fuels. Founded in 1981, RFA's 300-plus members are working to help America become cleaner, safer, more energy secure and more economically vibrant.

This is an important and timely hearing, and I am pleased to be here to discuss the future of our nation's ethanol industry and how S. 187—the "Biofuel Market Expansion Act of 2011" can help our country achieve its energy security goals.

Due to the visionary and invaluable work of this Committee in the 110th Congress, the Energy Independence and Security Act of 2007 (EISA) put our nation on a path toward greater energy diversity and national security through the expanded Renewable Fuels Standard (RFS). EISA has stimulated unprecedented investment in the U.S. biofuels industry and, as a consequence, the U.S. now leads the world in the production and use of clean, renewable, domestic liquid transportation fuels. For EISA's ultimate goal of 36 billion gallons of renewable fuel use to be realized, however, additional federal efforts to open markets, stimulate investments in new technologies and assist in the development of infrastructure for these new fuels will be necessary.

BACKGROUND

Today, ethanol is blended into roughly 90 percent of the gasoline sold in the U.S., the majority as E10 (10 percent ethanol and 90 percent gasoline)—a blend component adding octane, displacing toxics and helping refiners meet Clean Air Act specifications. Ethanol is a thoroughly tested, safe, and effective motor fuel. Americans spend nearly \$1 billion a day importing oil, often from hostile regions of the world. If the chaos in the Middle East teaches us anything, it should be that America must forcefully begin down the path of energy self-reliance. Increasing the use of domestic renewable fuels like ethanol is the first, and arguably, the easiest step we can take.

Already, ethanol production is contributing to our nation's financial well-being as well as that of American households. In 2010, ethanol production contributed \$53.6 billion to the national Gross Domestic Product and added \$36 billion to household incomes.

According to an economic analysis from Cardno ENTRIX, 70,600 Americans are employed directly in the production of ethanol and in industries providing goods and services to ethanol producers. The economic activity generated by ethanol production supported a total of more than 400,000 Americans in 2010.

Additionally, ethanol production is paying for itself. The increased economic activity and income generated by America's ethanol industry added some \$12 billion to federal, state and local governments through increased tax revenue.

Domestic ethanol production improves our nation's balance of trade while also reducing our reliance on foreign oil. The production of 13 billion gallons of ethanol means that the U.S. needed to import 445 million fewer barrels of oil in 2010 to refine gasoline. That is more oil than America imports from Saudi Arabia annually. Displacing these imported oil barrels saved the U.S. \$34 billion in 2010.

Finally, at a time when American drivers are facing rising gas prices, ethanol is helping to hold pump prices lower than they would be otherwise. Economists from government agencies like DOE, universities like Iowa State, and financial institutions like Merrill Lynch have examined the impact of increased ethanol blending on consumer gas prices. Their studies have concluded that increased blending of ethanol has generally reduced the price of gasoline by 15-50 cents per gallon. For the average American driver, that's an annual savings of \$120 to \$400 dollars. These savings result not only from the fact that ethanol has been \$0.50-\$1.00 cheaper than gasoline at the wholesale level for the last several years, but also from the fact that

replacing 13 billion gallons of gasoline reduces aggregate oil demand and, thus, exerts downward pressure on gasoline prices.

#### OPEN MARKETS

Because U.S. ethanol production capacity continues to grow steadily, there is a sense of urgency surrounding the need to move to ethanol blends that include more than 10 percent ethanol. The RFA is dedicated to maximizing the use of ethanol consistent with sound technical evidence. The RFA supports the safe and effective use of higher level ethanol blends in both conventional as well as Flex-Fuel Vehicles (FFVs). The RFA continues to work with engine and vehicle manufacturers, as well as non-road engine and vehicle manufacturers, to secure their support for the use of higher level blends of ethanol.

Moving beyond 10 percent ethanol blends is essential to achieving our nation's goals of reducing our reliance on foreign oil, and to foster the growth of a robust, domestic renewable fuels industry. The implementation of EISA and its 36 billion gallon RFS will require the use of ethanol beyond the traditional 10 percent blends. Cellulosic and advanced ethanol will largely represent the renewable fuel supply beyond the E10 blend market. To leave the market artificially constrained further limits market opportunities for next generation biofuels very close to commercialization, missing an opportunity to meaningfully increase America's use of renewable fuels and reduce our dependence on imported oil.

The U.S. Environmental Protection Agency (EPA) has approved E15 blends to be safe for use in all cars, pickups and SUVs built in 2001 and later, or 62 percent of vehicles on the road today according to car industry data—nearly two out of every three cars on the road today. If E15 were used in all vehicles covered by this decision, the theoretical blend wall for ethanol use would be approximately 17.5 billion gallons. The EPA continues to move in the right direction with respect to increasing ethanol blends, but challenges still remain. The RFA continues to urge EPA to extend the waiver for E15 use to all passenger vehicles. A report by the highly regarded automotive engineering firm, Ricardo Inc., concluded there were no unique emissions, material compatibility or drivability issues with older vehicles compared to 2001 automobiles. Our nation can and should move in the direction of ethanol blends in excess of 10 percent in conventional, gas-only vehicles.

As with any new fuel, additional testing and some regulatory issues relating to the fuel's properties must be addressed before widespread E15 use can occur. The RFA is working to address those issues and accelerate the commercial use of E15.

In addition to expanding the blend market, it will be critical to the future growth opportunities for cellulosic and advanced ethanol to promote ethanol's important role as an alternative fuel as well. Currently, the E85 market represents just a fraction of the overall U.S. ethanol market, but it is growing. We estimate that there are about 8.5 million flexible fuel vehicles on America's roadways today. That's up significantly from recent years and a testament to the leadership and commitment of General Motors and Ford; but it still represents just 3 percent of the total automotive fleet. Likewise, we estimate E85 and mid-level blends are offered at approximately 2,700 retail gas stations across the U.S. That's a huge improvement over the handful of E85 stations just a decade ago, but it still represents just 1.5 percent of the nation's gas stations. Obviously we have a long way to go if consumers are to be given the flexibility to maximize their use of domestic renewable fuels like ethanol. Efforts to expand FFV technology must be a part of our energy future.

#### STIMULATE INVESTMENT

A major policy objective of EISA was to accelerate the commercialization of new technologies and next generation biofuels. Certainly, by creating demand for at least 21 billion gallons of advanced biofuels by 2022, cellulosic ethanol and other advanced biofuels were given a tremendous boost. But the economic collapse of 2008 and the concurrent banking crisis made it extraordinarily difficult for these new technologies to secure financing. The U.S. Department of Energy (DOE) Loan Guarantee Program this Committee thoughtfully created has been hamstrung by a bureaucracy seemingly unwilling to meaningfully reduce the risk associated with these investments.

If the volumes of advanced biofuels envisioned by EISA and the infrastructure to support them are to be realized, the DOE Loan Guarantee Program must be more effectively implemented and Federal funding to this important program should be restored.

## REFUELING INFRASTRUCTURE

Achieving the goals of the RFS and giving Americans more control over their energy future can be done with smart policies and targeted investment that expand ethanol refueling infrastructure and use. In a climate of fiscal concerns, we can meaningfully expand the ethanol market, reduce our reliance on imported oil, and create jobs without breaking the bank. Addressing the infrastructure needs of America's renewable fuels policy cannot be based on a wish list. It must be grounded in sound research and analysis that identifies policy needs and the needs of the marketplace.

On March 7th, the RFA released a study on how the future requirements of the RFS can be met primarily with ethanol if the right commitments are made to ensure a steady evolution of refueling infrastructure and the automotive fleet.

The study, conducted by Air Improvement Resource, Inc. (AIR) and commissioned by the RFA, shows that the long-term requirements of the RFS can indeed be met mostly with ethanol if "blender pumps" are made available at approximately one-third of nation's 162,000 service stations, and if automakers honor and expand their commitment to produce more FFVs. (Blender pumps are fuel dispensers designed to dispense a variety of ethanol blends from 10 percent up to 85 percent ethanol.)

The AIR study examines 27 future scenarios regarding available ethanol volumes, FFV availability, ethanol use in non-FFVs, and the availability and location of blender pumps and/or E85 pumps. Based on the results of the scenarios, certain conclusions can be drawn about the role ethanol can play in meeting the RFS2, which ultimately requires the use of 36 billion gallons of renewable fuels by 2022.

Expanding the use of ethanol will take a multi-pronged approach. The EPA's approval of E15 for use in vehicles made in 2001 and subsequent years will help grow the potential market for ethanol to approximately 20 billion gallons over the next several years. Still, even if E15 is eventually used in all conventional vehicles, meeting long term RFS requirements with ethanol will necessitate a substantial increase in the availability and use of "mid-level" ethanol blends (i.e., blends consisting of more than 15 percent ethanol and less than 85 percent gasoline).

If all light-duty vehicles sold in the United States in 2015 and later years are FFVs, and if a corresponding expansion of refueling infrastructure occurs, ethanol could be used to meet the majority of the long-term RFS2 requirements. Under this scenario, the average ethanol blend needed in FFVs by 2022 would be nearly 30 percent (E30), while it is assumed all non-FFVs would be using E15.

The AIR report provided some key insights into the infrastructure and vehicle needs to make the RFS2 successful, including:

- Long term RFS requirements can be achieved if automakers honor and expand their commitments to ramp up production of FFVs, and if blender pumps are installed at roughly one-third of the nation's retail service stations.
- Even if E15 is eventually used in all conventional vehicles (non-FFVs), meeting long term RFS requirements with ethanol will necessitate a substantial increase in the availability and use of "mid-level" ethanol blends.
- Without the commitment of the "Detroit Three" automakers to ensure that 50 percent of the vehicles they produce in 2012 and subsequent years are FFVs, it would not be possible to meet long term RFS requirements.
- Even with the 50 percent FFV production commitment by the "Detroit Three," FFVs would need to refuel with E85 essentially three-quarters of the time or E56 all of the time by 2022. This highlights the need for an expanded commitment to FFV production from all automakers.
- If all vehicles sold in 2015 and subsequent years are FFVs, and if E15 is used in all non-FFVs, the average fuel blend consumed in FFVs will need to contain 29 percent ethanol by volume (E29) in order to satisfy the 2022 RFS2 requirements. Incidentally, E30 is one of the most common and popular blends dispensed from blender pumps today.
- If the RFS2 is to be met, blender pumps will need to be installed at a minimum of 53,000 service stations. This represents roughly 33 percent of service stations in the country. Efforts to install blender pumps should focus on areas with the highest levels of vehicle miles traveled per service station.

## S. 187—THE "BIOFUEL MARKET EXPANSION ACT OF 2011

Many of the challenges discussed are addressed by S. 187, legislation introduced by Senator Tom Harkin that would require certain fuel marketers to install blender pumps and tanks at an increasing percentage of their stations beginning in three years, and would also mandate that half of all new passenger vehicles sold in the U.S. be flexible fuel vehicles (FFV). The bill would also direct the Secretary of En-

ergy to make grants to direct retailers for 50 percent of the cost of installing blender pumps and storage tanks for ethanol.

The RFA supports S. 187. Without question, policies that expand the number of certified and approved blender pumps available to consumers to support the sale of blends between E15 and E85 for FFVs, and incentives that favor ethanol sales into the E10-E85 market will aid in the transition beyond the blend market for ethanol.

At a minimum, federal policies should maintain and extend existing tax incentives for higher level ethanol blends to allow for continued growth, expand tax incentives for refueling infrastructure, and create new consumer-based tax incentives to encourage the purchase of FFVs. The RFA supports legislative action to require a percentage of new vehicles sold in the U.S. be flexible fuel capable. Further, the RFA supports legislation requiring the installation of higher level ethanol blends refueling infrastructure.

#### CONCLUSION

The continued commitment of the 112th Congress, this Committee, and the enactment of legislation such as S. 187 will all contribute to ensuring America's future energy security.

Chairman Bingaman and Ranking Member Murkowski, you have made clear your commitment to the hardworking men and woman across America who are today's newest energy producers. The RFA looks forward to working with you to further develop and implement sound policies that provide the proper incentives to grow ethanol use across a variety of blending levels.

Thank you.

The CHAIRMAN. Thank you very much.

Mr. Eichberger, go right ahead.

#### **STATEMENT OF JOHN EICHBERGER, VICE PRESIDENT, GOVERNMENT RELATIONS, NATIONAL ASSOCIATION OF CONVENIENCE STORES, ALEXANDRIA, VA**

Mr. EICHBERGER. Thank you, Chairman Bingaman, Senator Murkowski, members of the committee. My name is John Eichberger. I'm with the National Association of Convenience Stores and our industry operates around 117,000 retail fueling outlets in the country. We generate about half a trillion dollars in sales every year. That is one out of 28 American dollars spent goes through the convenience store industry.

Fifty-seven and a half percent of all of our fueling stations are one store companies. They're not chains. They're Mom and Pop operations. We sell through—about 80 percent of the gasoline and diesel fuel in this country.

We're here today to evaluate the challenges facing the implementation of renewable fuel standard and to consider options for overcoming these challenges. I want to make it clear our members want to sell the fuel products that our customers want to buy. We want to find the best way to move forward in doing that.

In thinking about how to prepare my oral statement today I thought it might be a good idea to walk through the decision-making process a retailer faces when considering offering a new fuel. It's not the same as offering a new candy bar. It takes a little bit more of an investment.

So what I thought we'd start off doing is pick a retailer from your State that you're familiar with and let's pick a fuel. I'm going to use E15 as my example because that's the one we're familiar with. But it really could be anything.

It could be E40. It could be E50. It could be a liquefied chicken McNuggets and barbecue sauce. The facts are the same in terms of the decisionmaking process.

The first thing the retailer needs to consider is how much it will cost to enter this new market. Now assume he just installed state-of-the-art tanks, pipes and dispensers a year and a half/two years ago. He's probably thinking my equipment is probably safe enough to handle E15. Maybe I could just go ahead and do that.

Perhaps he's correct in the equipment is safe and compatible. But it does not necessarily mean that it is lawful to do so. Federal law requires that any equipment that stores or dispenses a flammable or combustible liquid must be certified by nationally recognized testing laboratories such as Underwriters Laboratories, as compatible with that fuel.

Now the challenge is that it wasn't until last spring that you all had listed that any dispensers as compatible with any fuel containing greater than 10 percent ethanol. That's means all the E85 stations in the country are using equipment that was not UL listed. They agreed to do that when they bought the equipment from their dispenser manufacturers. The dispenser manufacturer offered them an E85 compatible dispenser and charged them a seven to \$8 thousand premium for that unit, although it was not UL listed.

So it is most likely since no equipment was certified until last March, that the equipment at this retailer's location is not certified by UL. Therefore it must be replaced completely. A new dispenser, blender pumps that we've been talking about today, can cost upwards of \$20,000.

It's important to know what a blender pump is. We use them all the time. Typically you take premium tank. You take an unleaded tank. You run it through a blender pump and you provide the customer with a mid grade option. It's just a mixing unit.

In today's discussion we're talking about blender pumps maybe you're going to take an E85 tank and an E10 tank. Mix it together to get E15, E40 or whatever the mixture might be. But you're going to have to replace that dispenser under current law.

If the retailer has to replace his tanks and pipes. The second you crack concrete you're looking at maybe 100,000 or more depending on where they operate and what the environmental regulations are. So the retailer could be looking at an investment cost of \$120,000 just to sell E15 in a lawful manner.

But this retailer we're talking about, he's committed. He wants to be a leader in his community to renewable fuels. So he makes the investment.

Now he has to ask the question that Mr. Karr was referencing. Does the customer want to buy it? According to Mr. Dinneen's testimony, about 62 percent of vehicles approved by EPA to use E15 can do so. About 65 percent—or he said another 3 percent can use E85, flex fuel vehicles. So we're looking at a total population of vehicles, about 65 percent on the road, can lawfully buy E15.

But the question is can that 65 percent of the population. Do they want to buy it? The auto makers have already said they don't necessarily support EPA's decision on E15. Their warranties and user manuals do not support the use of that fuel. This could definitely impede demand. The retailer has to think about that.

This takes us to an important distinction. This is the first transition to a new fuel that does not require the customer to buy it. If you look back at the last couple decades when we pulled lead out

of gasoline. We pulled sulphur out of on road diesel fuel. The new vehicles manufactured were required to run on that fuel. So you had a definite guaranteed demand and that demand was going to grow over time because all new vehicles had to run on that product.

The other main difference is unleaded gasoline and ultra low sulphur diesel were backward compatible. All vehicles on the road were able to run on those fuels. You didn't have a concern with mis-fueling causing problems.

So we look at it now and say, we also have to look at the fact that the equipment at retail was able to run/use those fuels without being replaced. So now we look at the retailer and we think about OK, we have a limited demand. I'm going to do it anyway.

But how do I prevent consumers from mis-fueling? If a retailer offers a fuel and the customer mis-fuels that retailer could be held for violation of the Clean Air Act. He could be sued for any damage to the engine and voiding the warranty.

More importantly if that fuel is eventually ruled to be not appropriate and ruled defective he could be sued for selling a defective product. Even though at the time he sold it, it was lawful and compliant with all applicable laws and regulations. Retroactive liability is something he has to think about.

So with all these factors of play he may reconsider his decision to sell the fuel. So we need to talk about how we can eliminate these challenges and get the retailer to an answer of yes. I'm going to sell the fuels.

Several proposals being discussed today that are in my written statement, I just want to point out a couple things that we need to be considering when you think about new programs.

The first question is will the new fuels were discussing be backward compatible? If not, how do we protect consumer to legacy fuels vehicles and manufacturers and sellers of the fuel from potential damage and liability?

Will the consumers be able to use the new fuels being offered and will they actually buy them? That's demand.

Will retailers have to replace their equipment or will the new fuels be compatible and reduce costs?

Finally will the fuels be economically beneficial to the consumer? NACS recommends four things.

One, Congress should authorize a new method for determining the technical and lawful compatibility of equipment. We need to be able to look back and see if our existing equipment is compatible. Under current law and UL policy, we cannot recertify existing equipment. We have to replace it. We should be able to determine if that new tank and dispenser is safe, make it lawful to sell a new fuel. Reduce the cost of entry.

Congress should provide a regulatory certainty and legal protection to market participants who lawfully sell fuels according to today's regulations and protect them from retroactive liability if the laws change in the future.

Congress should refrain from picking a fuel of the future. We've talked about innovation. We've talked about where we need to go.

If we pick a fuel as the winner in the future, we will stifle innovation in new fuels, drop in fuels, biobutol. The research may actu-

ally stop because Congress has already said this is the fuel we're going to go to. We want to make sure those options stay open.

But challenges in implementing RFS are real but they can be overcome if we focus on the elements necessary to do so. I thank you for the opportunity to show our perspective. I look forward to your questions.

[The prepared statement of Mr. Eichberger follows:]

PREPARED STATEMENT OF JOHN EICHBERGER, VICE PRESIDENT OF GOVERNMENT RELATIONS, NATIONAL ASSOCIATION OF CONVENIENCE STORES, ALEXANDRIA, VA

#### SUMMARY

- NACS members make decisions each day regarding what products to sell and which services to offer their customers. But taking a chance by offering a new candy bar is very different from switching their fueling infrastructure to accommodate a new fuel. For this reason, and many others, they are often slow to adopt new fuel products until they are certain sufficient consumer demand exists to provide a reasonable return on their investment—an investment which in many cases can be significant.
- Our industry is committed to complying with today's laws and regulations, to provide our customers with the best products and services we can offer and to adapt to new technologies and market opportunities as they arise. NACS members are not beholden to any specific product—they simply desire to sell what the customer wants to buy provided it is lawful and, hopefully, profitable to do so. As new fuels come onto the market, our members want to have the legal option to sell these fuels if their customers wish to buy them.
- Retailers face many challenges when considering whether to sell a new fuel and these challenges must be overcome if the goals of the RFS are to be realized. Among these issues are the compatibility of retail storage and dispensing equipment; associated risks of a customer fueling a non-authorized engine with a new fuel; and associated risks of retroactive liability if today's laws governing the sale of such fuels change in the future.
- S. 187 highlights many of the issues standing in the way of new fuels, specifically the compatibility of engines to run on higher-blend ethanol fuels and the availability of these fuels at retail facilities. The discussion generated by this legislation is critical to finding the right solutions. Although NACS believes S. 187 misses the mark with its proposed solutions, we believe from this discussion other ideas can be developed that will move the market in the right direction and prepare it to accommodate new fuels.
- Proposals to set a fuel specification of the future would enable engine and equipment manufacturers time to build units that can accommodate the new fuel. NACS believes this is an interesting concept and if sufficient lead time were provided could yield some positive outcomes. However, NACS cautions against dictating specifically which fuel should be the "fuel of the future" since making such a decision based upon currently available technologies could undermine innovation and prevent the emergence of new fuel products that are more suitable to the nation's objectives and require less investment in infrastructure modifications. NACS is also concerned about the consequences of requiring another wholesale change in existing infrastructure to accommodate the new fuels.
- NACS urges Congress to consider proposals that will allow retailers to have existing equipment evaluated and certified as compatible with new fuels, thereby eliminating some of the costs associated with necessary replacements; protect market participants from liability in the event self-service consumers ignore warning notices and misfuel their vehicles; protect market participants from retroactive liability should today's laws governing fuel sales change in the future; and promote development of new fuel products that are more compatible with existing vehicles and infrastructure.

#### INTRODUCTION

Chairman Bingaman, Senator Murkowski and members of the Senate Energy and Natural Resources Committee. Thank you for the opportunity to present to you the perspective of the convenience and fuel retailing industry concerning the future of renewable and alternative fuels in the United States.

My name is John Eichberger and I am Vice President of Government Relations for the National Association of Convenience Stores (NACS). NACS is an international trade association comprised of more than 2,200 retail member companies and more than 1,800 supplier companies doing business in nearly 50 countries.

As of December 31, 2010, the U.S. convenience and fuel retailing industry operated 146,341 stores of which 117,297 (80.2%) sold motor fuels. In 2009, our industry generated \$511 billion in sales (one of every 28 dollars spent in the United States), employed more than 1.5 million workers and sold approximately 80% of the nation's motor fuel.

Our industry is dominated by small businesses. In fact, of the convenience stores that sell fuel, 57.5% of them are single-store companies—true mom and pop operations. Despite common misperceptions, the large integrated oil companies are leaving the retail market place and today own and operate fewer than 2% of the retail locations. Although a store may sell a particular brand of fuel associated with a refiner, the vast majority are independently owned and operated and the relationship to the fuel brand they sell ends there. The rest have sought to establish their own brand in the market.<sup>1</sup>

NACS members make decisions each day regarding what products to sell and which services to offer their customers. But taking a chance by offering a new candy bar is very different from switching their fueling infrastructure to accommodate a new fuel. For this reason, and many others, they are often slow to adopt new fuel products until they are certain sufficient consumer demand exists to provide a reasonable return on their investment—an investment which in many cases can be significant.

Our industry is committed to complying with today's laws and regulations, to provide our customers with the best products and services we can offer and to adapt to new technologies and market opportunities as they arise. NACS members are not beholden to any specific product—they simply desire to sell what the customer wants to buy provided it is lawful and, hopefully, profitable to do so. As new fuels come onto the market, our members want to have the legal option to sell these fuels if their customers wish to buy them.

It is with this background that NACS approaches the discussion about the future of renewable fuels. In this testimony, I will outline the challenges facing the retail motor fuel marketplace as it tries to accommodate the demands of the Renewable Fuel Standard (RFS), evaluate different legislative proposals designed to help overcome these challenges and provide NACS recommendations for policies that will assist the market transition to new, renewable and sustainable fuels.

#### THE BLEND WALL

Since enactment of the Energy Independence and Security Act (EISA) of 2007, Washington has been discussing the pending arrival of the blend wall—that point beyond which the market cannot absorb any additional renewable fuels. We can now say unequivocally that we are there.

The 2011 statutory mandate for the RFS is 13.95 billion gallons. If 10% ethanol were blended into every gallon of gasoline sold in the nation in 2010, we would max out at 13.85 billion gallons.<sup>2</sup> Meanwhile the market for higher blends of ethanol for flexible fuel vehicles (FFVs) has not developed as rapidly as some had hoped and there are few indications for a rapid expansion. So clearly we have a problem.

The recent decision by EPA to authorize the use of E15 in certain vehicles and engines does very little to expand the use of renewable fuels. This is primarily because there are many barriers to the introduction of E15 that must be overcome before it is fully legal or advisable for it to be sold<sup>3</sup> and the number of markets into which it may be sold are extremely limited.<sup>4</sup>

<sup>1</sup> See Attachment 1.

<sup>2</sup> U.S. Energy Information Administration Product Supplied 2010, Finished Motor Gasoline: 3.297 billion barrels ([http://www.eia.doe.gov/dnav/pet/pet\\_cons\\_psup\\_dc\\_nus\\_mbb1\\_a.htm](http://www.eia.doe.gov/dnav/pet/pet_cons_psup_dc_nus_mbb1_a.htm))

<sup>3</sup> See Attachment 2.

<sup>4</sup> Once E15 is officially registered and satisfies the various conditions required by EPA for sale in the market, other factors will continue to limit its availability. These include: 1) the Federal Reformulated Gasoline Program's complex model for emissions characteristics must be amended to accommodate E15; 2) The Clean Air Act's Reid Vapor Pressure one pound allowance afforded to gasoline blended with 9-10% ethanol must be amended to apply to fuels with up to 15% ethanol, otherwise such fuels would violate air quality control programs in many states and counties; 3) The California Reformulated Gasoline program does not allow for ethanol concentrations above 10%; and 4) Various contractual obligations with supplier companies may reduce the ability of branded retail outlets (representing approximately 50% of retail facilities) to sell fuels containing more than 10% ethanol.



But let's imagine for a moment that all barriers to E15 are removed, it can be used in all engines and it becomes ubiquitous in the market. At 15% maximum blend, we still can only blend 20.78 billion gallons of renewable fuels. While this would buy us four additional years of compliance with the RFS schedule, it is far short of the 36 billion gallons ultimately required.

That leaves us with the real issue facing us today—How can we get from here to there in a way that benefits consumers, our energy security and our economy?

One of the primary challenges facing the fuels market is the lack of planning that goes into establishing energy policy. The RFS was developed to promote energy independence, reduce our reliance on fossil fuels and benefit the environment. It set ambitious goals and focused on the materials used to produce our fuel. It did not, however, take into consideration how the fuel would be delivered into the consumer's vehicle. The distribution and retail infrastructure was largely ignored in favor of broader policy issues, yet it is precisely this component of the system that is presenting some of the greatest obstacles to successful implementation of the program.

Our backs are now to the wall, so to speak. We recognize there are infrastructure issues that must be addressed: more than 160,000 retail facilities, 230 million vehicles and hundreds of millions of small engines are incapable of accommodating any additional renewable fuels.

So what policies can Congress consider that will help bridge the gap between what we can do and what we are required to do by law? Before we can answer that question, it is critical to understand the challenges that face the retail infrastructure.

#### INFRASTRUCTURE LIMITATIONS

##### 1) *Compatibility*

The reason the retail market is unable to accommodate additional volumes of renewable fuels begins with the equipment found at retail stations. By law, all equipment used to store and dispense flammable and combustible liquids must be certified by a nationally recognized testing laboratory. These requirements are found in regulations of the Occupational Safety and Health Administration.<sup>5</sup>

Currently, there is essentially only one organization that certifies such equipment—Underwriters Laboratories (UL). UL establishes specifications for safety and compatibility and runs tests on equipment submitted by manufacturers for UL listing. Once satisfied, UL lists the equipment as meeting a certain standard for a certain fuel. Prior to last spring, UL had not listed a single motor fuel dispenser (a.k.a. pump) as compatible with any fuel containing more than 10% ethanol. This means that any dispenser in the market prior to last spring is not legally permitted to sell E15, E85 or anything above 10% ethanol—even if it is technically able to do so safely.

If a retailer fails to use listed equipment, that retailer is violating OSHA regulations and may be violating tank insurance policies, state tank fund program requirements, bank loan covenants, and potentially other local regulations. Furthermore, if the retailer experiences a petroleum release from that equipment, he could be sued on the grounds of negligence for using non-listed equipment, which would subject him to penalties above and beyond the cost of remediation.

This brings us to the primary challenge: If no dispenser prior to early 2010 was listed as compatible with E10+ fuels, what options are available to retailers to sell E10+ fuels?

In February 2009,<sup>6</sup> UL issued a letter announcing that dispensers listed under a certain UL standard as compatible with E10 were in fact safe to handle fuels containing up to 15% ethanol. UL said that it would support “local authorities having jurisdiction” to provide waivers to retailers who wished to increase their ethanol blends through these dispensers. UL did not, however, change the official certification of those dispensers. Consequently, retailers who relied upon local authority

<sup>5</sup> 29CFR1926.152(a)(1) “Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids.” “Approved” is defined at 29CFR1910.106 (35) “Approved unless otherwise indicated, approved, or listed by a nationally recognized testing laboratory.”

<sup>6</sup> Underwriters Laboratories. ([http://www.ul.com/global/eng/pages/corporate/newsroom/newsitem.jsp?cpath=%2Fglobal%2Feng%2Fcontent%2Fcorporate%2Fnewsroom%2Fpressreleases%2Fdata%2Funderwriterslaboratoriesannouncessupportforauthoritieshavingjurisdiction20090219140900\\_20090219140900.xml](http://www.ul.com/global/eng/pages/corporate/newsroom/newsitem.jsp?cpath=%2Fglobal%2Feng%2Fcontent%2Fcorporate%2Fnewsroom%2Fpressreleases%2Fdata%2Funderwriterslaboratoriesannouncessupportforauthoritieshavingjurisdiction20090219140900_20090219140900.xml))

waivers would still be in violation of all laws and regulations requiring listed equipment.

However, in December 2010<sup>7</sup> UL rescinded that notice based upon new research that indicated issues with gaskets, seals and hoses when exposed to E15. UL now recommends that only equipment specifically listed by UL as compatible with E10+ fuels be used for such fuels.

Unfortunately, this places a significant economic burden on the retail market. UL policy prevents retroactive certification of equipment. In other words, only those units produced after UL certification is issued are so certified—all previously manufactured devices, even if they are the same model, are subject only to the UL listing available at the time of manufacture. This means that no retail dispensers, except those produced after UL issued a listing last spring, are legally approved for E10+ fuels.

In other words, under current requirements any retailer wishing to sell E10+ fuels must replace their dispensers. On average, a retail motor fuel dispenser costs approximately \$20,000.

It is less clear how many underground storage tanks and associated pipes and lines would require replacement. Many of these units are manufactured to be compatible with high concentrations of ethanol, however they may not be listed as such. Further, if there are concerns with gaskets and seals in dispensers, care must be given to ensure the underground gaskets and seals do not pose a threat to the environment. Once a retailer begins to replace underground equipment, the cost can escalate rapidly and can easily exceed \$100,000 per location.

## 2) *Misfueling*

The second major issue facing retailers is the potential liability associated with improperly fueling a vehicle with a non-approved fuel. The EPA decision concerning E15 puts this issue into sharp focus for retailers. Under EPA's partial waiver, only vehicles manufactured in model year 2001 or more recently are authorized to fuel with E15. Older vehicles, motorcycles, boats, and small engines are not authorized to use E15.

For the retailer, bifurcating the market in this way presents serious challenges. How does the retailer prevent the consumer from buying the wrong fuel? Typically, when new fuels are authorized they are backwards compatible so this is not a problem. In other words, older vehicles can use the new fuel.

Example 1: When EPA phased lead out of gasoline in the late 1970s and early 1980s, older vehicles were capable of running on unleaded—newer vehicles, however, were required to run only on unleaded. These newer vehicle gasoline tanks were equipped with smaller fill pipes into which a leaded nozzle could not fit—likewise, unleaded dispensers were equipped with smaller nozzles.

Example 2: When EPA mandated a 97% reduction in the sulfur content of on-road diesel fuel, trucks manufactured beginning with model year 2007 were required to use only ultra low sulfur diesel (ULSD) fuel. Earlier model trucks were able to run on this new fuel. Misfueling was limited by a combination of a mandated oversupply of ULSD (which limited the supply of the restricted fuel and therefore limited the potential for misfueling) and enforced labeling requirements.

E15 is very different—legacy vehicles are not permitted to use the new fuel. Doing so will violate Clean Air Act standards and could cause engine performance or safety issues. Yet, there are no viable options to retroactively install physical countermeasures to prevent misfueling. Further, the risk to retailers of a customer using E15 in the wrong engine—whether accidentally or intentionally—are significant.

First of all, retailers could be subject to penalties under the Clean Air Act for not preventing a customer from misfueling with E15. This concern is not without justification. In the past, retailers have been held accountable for the actions of their customers. For example, because unleaded fuel was more expensive than leaded fuel, some consumers physically altered their vehicle fill pipes to accommodate the larger leaded nozzles either by using can openers or by using a funnel while fueling. The retailer had no ability to prevent such behavior, but the EPA often levied fines against the retailer for not physically preventing the consumer from bypassing the misfueling countermeasures.

<sup>7</sup> Underwriters Laboratories. (<http://www.ul.com/global/eng/pages/offering/industries/energy/alternative/flammableandcombustiblefluids/updates/>)

To EPA's credit, they have asserted that they would not be targeting retailers for consumer misfueling. But that provides little comfort to retailers—EPA policy can change in the absence of specific legal safeguards. Further, the Clean Air Act includes a private right of action and any citizen can file a lawsuit against a retailer who does not prevent misfueling. Whether the retailer is found guilty does not change the fact that defending against such claims can be very expensive.

Furthermore, the consumer may seek to hold the retailer liable for their own actions. Using the wrong fuel could void an engine's warranty, cause engine performance problems or even compromise the safety of some equipment. In all situations, some consumer may seek to hold the retailer accountable even when the retailer was not responsible for the improper use of the fuel. Once again, the defense to such claims can be expensive.

### 3) *General Liability Exposure*

Finally, there are widespread concerns throughout the retail community and with our product suppliers that the rules of the game may change and we could be left potentially exposed to significant liability. For example, E15 is approved only for certain engines and its use in other engines is prohibited by the EPA due to associated emissions and performance issues.

What if E15 does indeed cause problems in non-approved engines or even in approved engines? What if in the future the product is determined defective, the rules are changed and E15 is no longer approved for use in commerce? There is significant concern that such a change in the law would be retroactively applied to any who manufactured, distributed, blended or sold the product in question.

Retailers are hesitant to enter new fuel markets without some assurance that their compliance with the law today will protect them from retroactive liability should the law change in the future. It seems reasonable that law abiding citizens should not be held accountable if the law changes in the future. Congress could help overcome significant resistance to new fuels by providing assurances that market participants will only be held to account for the laws as they exist at the time and not subject to liability for violating a future law or regulation.

## RESOLVING THE CHALLENGES

While these challenges facing the retail market are significant, they are not insurmountable. Several proposals have been put on the table by Members of Congress or other stakeholders, and each deserves consideration. While none may be a solution by itself, there are elements within each that can help guide the discussion towards a solution that might benefit all stakeholders and help achieve the national objectives.

### *S. 187, The Biofuels Market Expansion Act of 2011*

The Biofuels Market Expansion Act of 2011 (S. 187) seeks to require the production of additional flexible fuel vehicles that can run on anything from E0—E85. This section seeks to increase the potential demand for higher blends of ethanol. This is a critical factor because when retailers are considering the introduction of a new product they want to know if their customers can and will buy that product. By expanding the number of customers who “can” buy the product, part of this equation is addressed. The other component (will the customer buy the product?) is much more difficult to quantify, but the legislation is trying to make some progress by expanding the customers' ability to buy the product.

But is a production mandate necessary? Perhaps not. The domestic auto manufacturers are committed to increasing the volume of FFVs on the road and they do receive fuel economy credits for doing so. What incentives might Congress consider to encourage foreign auto makers to bring FFVs to the U.S.? The incremental cost of an FFV compared to a regular gasoline engine is quite low so perhaps the incentive would be cost effective.

Another option that could be considered to increase the number of FFVs on the market is to review the EPA approval process for after-market conversion kits. There are companies making kits to retrofit legacy vehicles to run on higher ethanol blended fuels, but the approval process is quite costly and burdensome. Perhaps Congress can review policies that would expedite the availability of such retrofit kits and provide consumers an incentive to convert their vehicles to run on both gasoline and higher ethanol-blended fuels. The cost of doing so is not prohibitive and this could help increase the number of FFVs on the market, thereby improving the economic calculation for the retailer.

Another component of the bill addresses the availability of higher ethanol blended fuels. One of the complaints the auto makers have raised is that their FFV customers have few options to refuel with E85. That is true, but I must point out that

there is no requirement for customers to fuel with E85 (unlike with the transitions to unleaded and ULSD) and their purchase decisions are predominantly driven by economics. In many markets, the economics of E85 do not enable the product to remain competitive with gasoline and E85 retailers often watch FFV customers fuel with regular gasoline, rendering their investment in E85 infrastructure moot.

S. 187 tries to address concerns about the limited availability of higher blended ethanol fuel by requiring that refiners pay for the installation of blender pumps capable of selling these fuels.<sup>8</sup> The bill stipulates that a certain percentage of the stations directly owned by the refiner, as well as those owned by independent operators selling the refiner's brand of fuel, install blender pumps. It further establishes a grant program for independent non-branded operators to install blender pumps.

While it is clear that the bill is trying to bring ethanol dispensers to market without placing a financial burden on independent retailers, it fails to recognize that costs incurred upstream will be passed through to the retailers and ultimately the consumer. So how much will S. 187 potentially cost?

According to the National Petroleum News' Market Facts 2010 report,<sup>9</sup> in 2009 the top 15 refiner brands were sold through 83,150 branded locations. S. 187 would require that 10% of these locations install a blender pump by 2014; 20% by 2016; 35% by 2018 and 50% by 2020.

To estimate the potential cost of this program, we can use a very rough estimate that a new UL listed blender pump will cost approximately \$20,000. Replacing the underground equipment at each site could cost on average \$100,000. The total cost per location could be \$120,000. In this worst case scenario, the associated costs to the industry and, ultimately, consumer would be:

Year	Locations Mandated	Cumulative Cost
2014	8,315	\$0.997 B
2016	16,630	\$1.995 B
2018	29,102	\$3.492 B
2020	41,575	\$4.989 B

For the independent, non-branded locations the legislation creates a grant program to help offset the cost of installation of a compatible blender pump and associated equipment including tanks, offering 50% of the entire cost of the project. Understandably, and in keeping with reasonable public policy, those who accept the federal cost share must commit to selling an eligible fuel through the new equipment for at least two of the subsequent four years.

While many retailers will seek to avail themselves of federal financial assistance, grant programs come with challenges for the retailer. In some situations, the retailer may wish to try offering his customers a new fuel. But if that fuel is not successful, the retailer may wish to revert to the original product offering. Under the grant program, this is not easy to do. Consequently, a grant program may provide some benefits to retailers who are already committed to selling a new fuel, but because of its conditions it may not have much influence over those who are not convinced a new fuel is the right decision for their store.

While NACS does not believe S. 187 hits the target with its approach to the issues, we believe it helps highlight the core problems facing the retail market and the introduction of new fuels. But perhaps there is a better approach.

#### *Prospective Compatibility Requirements*

Another proposal that has been floated and might be under consideration by some members of this committee is to set a target date at which time a new renewable fuel blend will be authorized and engines will be engineered to run on that fuel.

<sup>8</sup>“Blender pumps” are dispensers that can mix liquid fuel products from multiple storage tanks to produce another product. The most popular example is a blender pump using Premium gasoline and Regular octane gasoline to produce Mid-grade. In the case of S. 187, a blender pump would conceivably use a higher ethanol blended fuel product (perhaps E85) and mix it with a lower ethanol blended fuel product (E10) to produce a mid-level ethanol product. The blend ratios are set by the owner of the dispenser to provide the consumer with a pre-set selection of fuel blends. Some misunderstand this technology and assume the consumer will be able to adjust the blend ratio to their preference. This would create significant challenges and involve multiple regulatory agencies.

<sup>9</sup>See attachment 3.

For example, it could stipulate that E40 will be approved and engines will be designed to run on it by year 2016.

This approach is very interesting. If developed appropriately, it could provide auto and other engine manufacturers sufficient lead time to calibrate their products to run on the new fuel. In addition, the new engines can be engineered with physical misfueling countermeasures that can help limit the incidence of consumers using the wrong fuel in their engines.

Such a proposal also could eliminate the stair step process that will inevitably occur in our efforts to reach the goals of the RFS—a process begun with the E15 rule and that will likely initiate a new battle with each subsequent step. A necessary component of such a strategy would be to amend the implementation schedule of the RFS to provide sufficient time for the new fuel to enter the market.

For these reasons, it is a worthy of further consideration to see if remaining issues can be resolved. However, these remaining issues are primarily found at the retail level of trade and may be the most challenging to overcome. For if the current infrastructure is unable to accommodate E15, how likely is it to be able to accommodate a fuel formulation that would ultimately satisfy the RFS, such as E30 or E40?

Once again, we find ourselves trying to adjust an infrastructure composed of 160,000 retail outlets to a new fuel formulation that might not be compatible with the underground storage tanks, pipes and dispensers currently in use.

Considering that the typical store operates eight fueling position through four dispensers, we can estimate a total retail dispenser population of 640,000. How many of these will have to be replaced? If only UL-listed devices are allowed to sell these products, one can assume nearly all of them would have to be replaced.

Further, according to EPA's Office of Underground Storage Tanks, there are 215,000 sites in the U.S. (retail plus non-retail) that operate approximately 597,000 active underground storage tanks.<sup>10</sup> How many of these will have to be replaced? It is uncertain how many are listed as compatible with anything higher than E10, so one would have to assume the majority would have to be replaced.

Congress must take into consideration that it was not long ago (1988-1998) that federal law required that all USTs in the country be removed from the ground and retrofitted with leak detection, spill prevention and anti-corrosion systems. The wholesale retrofit requirements led to the closure of thousands of facilities due to the costs required to comply with the new law. Since then, many states have enacted additional requirements that have forced retailers to retrofit or replace the systems that were installed to comply with the federal law. Another round of mandatory replacements will be a very hard sell.

Using the same estimated costs applied to the requirements under S. 187 (\$20,000 per dispenser and \$100,000 per UST system), one could estimate the cumulative cost of a wholesale retrofit of the entire fuel dispensing infrastructure to be \$12.8 billion for dispensers and \$59.7 billion for UST systems. In addition, it would likely take 10–15 years to roll-over the existing infrastructure.

For the individual store owner who might operate two underground storage tanks and four dispensers, the cost could be upwards of \$200,000. In 2009, an average a single convenience store reported approximately \$33,000 in pre-tax profits. That is only a small fraction of the cost such a contemplated upgrade would require.

NACS further cautions against picking one specific fuel as the “fuel of the future.” Rather, it would be more constructive to identify key characteristics of the new fuel to which engines and equipment could be manufactured, set the timeline for attaining the goal, and allow technology, science and the market determine which fuel will be the sustainable choice. It most definitely will be a renewable, cleaner burning fuel that will help achieve the overall objectives of national energy policy.

As discussions on these strategies continue, it would be in the best interests of consumers and the economy as whole to consider alternatives that could alleviate the costs associated with the infrastructure retrofit.

#### *Alternative Strategy*

Under current legal requirements that equipment must be listed by a nationally recognized testing laboratory, most of the nation's retail infrastructure must be replaced to accommodate any new fuel. However, NACS questions if that is technically required to ensure environmental health and safety?

At one time, UL believed existing dispensers could accommodate 15% ethanol without problem. Further research demonstrated challenges with some seals, gaskets and hoses. Clearly, no retailer wants their equipment to leak, but can suscep-

<sup>10</sup>U.S. Environmental Protection Agency Office of Underground Storage Tanks “FY 2010 Annual Report on the Underground Storage Tank Program” ([http://www.epa.gov/oust/pubs/fy10\\_annual\\_ust\\_report\\_3-11.pdf](http://www.epa.gov/oust/pubs/fy10_annual_ust_report_3-11.pdf))

tible components be replaced with compatible components and deliver a safe dispenser at a fraction of the cost for a new one?

Furthermore, many underground storage tanks are likely compatible with certain new fuels even if they are not listed as such. For example, a double wall steel tank equipped with a proper anticorrosion system is likely compatible with any concentration of ethanol. Should such a system be required to be replaced simply because it was not originally listed for such fuels?

NACS believes that there is an opportunity to provide a lower cost of entry for new fuel blends by adjusting the legal requirements for demonstrating compatibility of retail fueling equipment. Because UL will not retroactively certify any equipment, perhaps Congress could authorize an alternative method for certifying legacy equipment. Such a method would preserve the protections for environmental health and safety, but eliminate the need to replace all equipment simply because the certification policy of the primary testing laboratory will not re-evaluate legacy equipment.

Legislation to accomplish this objective was introduced in the House of Representatives last Congress by Reps. Mike Ross (D-AR) and John Shimkus (R-IL) as H.R. 5778, the Renewable Fuels Marketing Act. This bill directed the EPA to develop guidelines for determining the compatibility of equipment with new fuels and stipulates equipment that satisfied such guidelines would thereby satisfy all laws and regulations concerning compatibility.

Such an approach would ensure that equipment used for new fuels is fully compatible with those fuels and provide retailers the possibility that does not exist today to enter new fuel markets without having to replace all of their equipment. While this approach will not resolve all compatibility issues in the market, it will provide opportunities for many retailers to avoid costly and unnecessary investments, which will in the long run save consumers money.

#### RECOMMENDATIONS

This transition to a new fuel market is unique in the fact that it is not backwards compatible and consumers are not required to buy the new fuel. As noted above, the transition to unleaded gasoline and ultra low sulfur diesel was accompanied by a requirement that consumers must purchase the new fuel for new vehicles. But they also were developed in such a way that older vehicles were fully capable of operating on the new fuel. Such is not the case today.

Another difference between today's transition and those of the past is the effect the new fuel blends have on the retail infrastructure. There was no need to replace tanks or dispensers when lead and sulfur were phased out of the fuel—retailers simply needed to ensure an appropriate transition of their inventories. But the transition to higher blends of ethanol poses very serious challenges due to the corrosive nature of the additive product. How to overcome this challenge must be a priority of this Congress.

To date, most policymakers focus on the future of renewable fuels and the role for ethanol in that market. This is understandable considering ethanol is the dominant renewable fuel additive and likely will be for the foreseeable future. But whether produced from corn, sugar cane or switchgrass, ethanol has chemical characteristics which negatively affect the infrastructure—both at the retail station and in the consumers' engines. This should cause Congress to pause and consider carefully in which direction it wishes to go.

NACS believes the challenges standing in the way of the RFS are surmountable, provided Congress is willing to address them directly and provide alternative pathways to achieving the national objectives. To accomplish the stated objectives of the RFS, NACS suggests Congress consider the following policies:

- Provide retailers with a mechanism to have existing storage and dispensing equipment evaluated to determine if they are technically compatible with new fuels and, if so, provide legal authority to use that equipment to sell new fuels. This will potentially save the industry, and consumers, billions in unnecessary investments.
- Provide retailers with labeling requirements for new fuels that educate and inform consumers about the authorized uses of new fuels. Ensure that compliance with such requirements will satisfy a retailer's requirements under the Clean Air Act and protect them from violations or engine warranty claims in the event a self-service customer ignores the notifications and misfuels a non-authorized engine.
- Provide market participants with regulatory and legal certainty that compliance with current applicable laws and regulations concerning the manufacture, dis-

tribution, storage and sale of new fuels will protect them from retroactive liability should the laws and regulations change at some time in the future.

- Encourage and facilitate the production and conversion of flexible fuel vehicles, thereby increasing the potential market demand for higher blends of ethanol fuels and creating a more attractive market for retailers to offer such fuels.
- Evaluate the prospects for marketing of infrastructure-compatible fuels and support the development of such fuels. These could aid compliance with the RFS and save retailers, engine makers and consumers billions of dollars. Policymakers might consider establishing characteristics that new fuels must possess so that equipment and engines can be manufactured or retrofitted to accommodate whichever new fuel provides the greatest benefit to consumers and the economy.
- Refrain from pre-selecting the “fuel of the future” and allow the market to determine the product that will most benefit consumers and the economy. To pre-select a winner based upon current available technologies will undermine innovation and prevent the market from developing a better option that may not be apparent to policymakers.

The nation’s convenience and fuel retailers are ready to assist Congress in its consideration of policies that will promote a stable and efficient market for transportation fuels. There are many factors to consider and we hope that policymakers will proceed cautiously and avoid imposing unnecessary and costly burdens on the system.

Thank you for the opportunity to share our perspectives with the Committee.\*

The CHAIRMAN. OK. Thank you all for your excellent testimony. Let me start with a few questions.

On this issue of reduced BTU content for ethanol compared to traditional gasoline. I think Mr. Karr, you talked about this issue, I think, and how this poses a problem. I’d be interested in any of the rest of you responding to that.

Mr. Dinneen, do you see this as an issue that we need to worry about here? I mean, what’s the solution to this problem?

Mr. DINNEEN. I think every gasoline component is going to have different qualities. Ethanol has higher octane content than most other gasoline components. That’s why it’s valuable to refiners.

I do think it makes a great deal of sense as we’re moving forward and trying to improve fuel efficiency. The auto companies have made a pretty compelling case that they need to increase octane. There’s probably not much more fuel efficiency they can get with— if they have to design a vehicle for 89 octanes.

So a fuel of the future, most likely, is going to have to have a higher octane. I think they can design vehicles for that.

The CHAIRMAN. This question that, sort of, is embedded in this, all of these discussions of whether we should be promoting more use and the building of infrastructure to accommodate E85 or whether we should put more emphasis on some kind of mid-level blend, something above E15, but something substantially less than E85. I’m not clear as to where any of you come out on that decision.

Mr. Eichberger, did you have a thought as to which of those two makes the most sense from the perspective of the folks you represent?

Mr. EICHBERGER. From an infrastructure compatibility standpoint there’s very little difference. However, from a marketing perspective I’ve always questioned why was E85 picked as the fuel for alternative refueling cars for flex fuel vehicles? E85 has a 25 to 30 percent fuel economy disadvantage compared to gasoline.

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\*[Note: All attachments have been retained in committee files.]

E40/E50 have a much lower penalty on fuel economy. So consumer acceptance to a mid-level fuel that provides more miles per gallon would probably be greater. Plus, if you don't have that huge distinction in fuel economy the retailer may actually be able to obtain product that can be priced competitively at the retail location with gasoline and actually encourage consumption.

Whereas E85 the price differential is so significant. Sometimes that cost factor is not available at the retailers. So I think a mid-level ethanol blend if we can get to a compatible infrastructure makes a little bit more sense from a marketing perspective.

The CHAIRMAN. OK. Any of the rest of you have a thought on this?

Mr. KARR. I think our experience with E85 today shows, as I sort of indicated in my testimony that maybe the chicken and egg problem isn't as simple as, you know, we thought it was five or more years ago. That price, again, price and performance from the consumer perspective are critical. From an engine manufacturers perspective the narrower the range or more precise fuel spec that you're building a vehicle to, the better you can optimize the performance of that vehicle both from a smog forming emissions perspective and also from a fuel economy perspective.

So for example, the ethanol producers are running this really kind of interesting experiment if you're a NASCAR fan. With NASCAR this year where they're running E15 at all the NASCAR races. They're not, you know, Kyle Busch is not pulling into the pits and putting a different blend of fuel in his car each time, E20 or E30 or E10. I mean, they are running on a very precise fuel. That's because they are optimizing the performance of those vehicles.

The same way, I mean, we're not building NASCAR race cars for everyone. But we are building great cars that perform very well. We can do that best, again, from an engine manufacturer's perspective, when you know what fuel spec you're building to.

The CHAIRMAN. OK.

Mr. Dinneen, did you have a thought on this?

Mr. DINNEEN. I did. Actually I'm all about flexibility. The point is we need to move beyond E10.

I think flex fuel vehicles provide the most flexibility to consumers. It's not a mandate that they can dial in the blend that they think makes the most sense. Frankly there is a fair amount of anecdotal evidence to suggest that given the opportunity people seem to be gravitating toward E30 because that is a blend level that they have noticed to provide them with the best gas mileage and performance.

But I'm very encouraged by Mr. Karr's testimony today that they acknowledge the need to move beyond E10. I think we need to move in that direction.

The CHAIRMAN. Mr. Brady, is this something that you have a perspective on?

Mr. BRADY. I do. As I said earlier, breaking through the blend wall is critical. I think if E30 motivates auto makers and motivates blender pump installations then we should do it.



I do think we have to ask ourselves whether E30 will get us all the way to the RFS-2 gallons and whether or not higher blends, such as E85, gives us more flexibility in our ability to get there.

The CHAIRMAN. Senator Murkowski.

Senator MURKOWSKI. Thank you.

I'm going to bring up the issue that we're all talking about here which is how do we pay for all the things that we want. Mr. Dinneen, Mr. Brady, you have both asked for a strong flex fuel mandate and the blender pump assistance, the extension of the cellulosic tax credit and perhaps more funding for the Loan Guarantee program. So the real question is how do we pay for it? Where do we find the offset?

As you know there's discussion on the floor. I don't know whether we actually get to a vote on the ethanol subsidy. But you know as well as anybody that that's circulating out there. A real focus right now on what is happening with the level of subsidies and basically how do we pay for those things that clearly would help the industry. I wouldn't disagree with that. But how do we do it?

Mr. DINNEEN. Senator, I think our industry has stepped up and worked with members of the Senate and the House and the Administration to reform the Ethanol Tax Incentive program. We do think that that is necessary. We think it's appropriate.

The fact of the matter is the ethanol industry has grown considerably. The cost of the incentive has grown. I think that there is a way to do it in a way that would allow the industry to continue to evolve and to grow but is sensitive to the fiscal concerns that you're expressing.

I sort of wait for any other industry that is benefiting today from tax incentives to step up and offer to do the same thing. Look, we recognize that the ethanol incentive, as it has been, needs to change. We want to do that in a way that is fiscally responsible. We want to do that in a way that recognizes that, you know, there's a great deal of volatility in the oil market that continues to jeopardize our fuel.

While it's a little hard to remember right now at \$105 a barrel of oil, we're 24 months removed from \$39 a barrel of oil. So let's protect the investments that the taxpayers made in this industry by having some kind of a variable incentive that would provide marketers with the incentive to blend when the marketplace isn't doing that. But at \$105 a barrel of oil, the marketplace is already doing it.

I do think that there's other ways that we can use the tax policy to encourage investments in second generation biofuels. We need to be focused on that as well. But I don't think it makes sense to just throw the baby out with the bath water.

I think we need to be fiscally responsible. But I do think we need to allow this industry to continue to grow and evolve. Like I said, I await any other energy industry to step up and make that same commitment.

Senator MURKOWSKI. Let me ask you then since talking subsidies here. Let me ask you a question about the tariffs because we're now seeing Brazil importing. It's a small quantity, but they're importing a small quantity of ethanol from the United States. I think

it's probably fair to say it was kind of a surprise to see the barges going in the other direction.

But ethanol clearly appears to have made some real strides in the cost competitiveness. So the question would then be is it time to reduce or perhaps eliminate our tariffs on imports?

Mr. DINNEEN. The tariffs on imports has never been a barrier to entry. Yes, we are shipping ethanol today to Brazil because their marketplace demands it. But in the past we have imported product from Brazil when our marketplace has needed it. The product test flowed back and forth as the market—the situation requires it.

The tariff has been there not to protect the industry, but to protect the taxpayer lest the tax incentive that is made available to refiners, whether that product is imported or domestic, would be supporting product from Brazil that's already the beneficiary of decades of government investment. So it's merely to assure that the tax incentive does what it's intended to do. That is to stimulate domestic production and domestic demand.

Senator MURKOWSKI. Let me ask a question. This would probably be to Mr. Karr and Mr. Eichberger and this is both of you have mentioned the liability issue.

Mr. Eichberger, you spoke more directly to the issue of the potential for mis-fueling. How do we deal with this liability issue? Is EPA doing enough, I guess, to really educate the consumer about not selecting the wrong fuel blend?

Mr. EICHBERGER. When you look at going backward in the legacy fleets you cannot retrofit the vehicles to put a physical mis-fueling countermeasure. When we pulled lead out of gas and then we changed the fill pipe size.

Senator MURKOWSKI. Right.

Mr. EICHBERGER. But change the nozzle size. They can't do that anymore.

Senator MURKOWSKI. Why not?

Mr. EICHBERGER. You'd have to retrofit the vehicles. You'd have to do a complete recall of all the cars. It just doesn't make a whole lot of logistical sense.

We have been supporting legislation in the House of Representatives that would put a little more meat on the bones for the labeling requirements. We've all—EPA is working on labels for E15. We advocated extremely high profile labels, different colors, different sizes, to make sure the customer sees it. To educate the customers as best we can.

We believe that if a retailer does everything they're supposed to do and educates the consumer. There's an education program from EPA which has not been rolled out yet. Then if the consumer, self service customer, ignores the warning labels, the self service customer should take responsibility on themselves for any damage to the engine.

Now that does not prevent mis-fueling. But from a retailer perspective it makes it a little more comfortable to move in to try new fuels that may have a limited market application. If we know that if the self service customer ignores everything we tell them, they're not going to turn around and sue us. We're not going to be fined for Clean Air Act violations.

It doesn't prevent. But it helps provide a little bit more comfort to the marketplace.

Senator MURKOWSKI. Do you see the liability issue as one that if we fail to resolve this you will have your Mom and Pop operators who simply choose not to go there with these other fuel selections?

Mr. EICHBERGER. You will have quite a few retailers choose not to go in this direction. Mom and Pop retailers may actually try because they have less to lose. The larger chains—

Senator MURKOWSKI. That's fair.

Mr. EICHBERGER. They're much more hesitant to move into this market because not only do you have the mis-fueling issues but what if the mis-fueling causes a determination that it's a defective product down the road. A lot of us are familiar with the MTB litigation that resulted in multibillions and billions of dollars of lawsuits. We're not willing to go down that road again.

Senator MURKOWSKI. Thank you, Mr. Chairman.

The CHAIRMAN. Senator Shaheen.

Senator SHAHEEN. Thank you.

Mr. Brady, I have to start with you since you're from New Hampshire. Can you just briefly describe what some of the benefits and also the disadvantages are to cellulosic verses ethanol from corn?

Mr. BRADY. The advantages are first of all that it's a non food source. It is also has a better carbon footprint when you look at the total life cycle of cellulosic relative to first generation. Those are the advantages.

I think on an operating cost basis they're pretty similar.

The disadvantage to build a cellulosic ethanol plant is more expensive than to build a corn ethanol plant. So the capital costs are significantly higher. They will come down over time. But fundamentally they'll always be a bit higher than first generation.

Senator SHAHEEN. Why is it higher?

Mr. BRADY. It's all along the process. But if you just think in the beginning. We, in the Michigan project, we bring in wood and have to debark it and chip it whereas corn is generally just ground up in the front. That's No. 1.

No. 2, it takes twice as long to ferment cellulosic than it does corn based starch. Those facts just carry through the entire process.

Senator SHAHEEN. OK.

In 2007 there was a renewable fuel standard created in the Energy Independence and Security Act. Has that been enough to really drive investment in biofuels? I'll ask you that, Mr. Brady and then if the others would like to comment.

Mr. BRADY. It definitely helped. The 16 billion cellulosic mandate in 2022 definitely helped. I think when we now get to, as I tried to explain earlier, as we now get to the big capital investment in the big plant. Investors start to ask are there the infrastructure pieces in place to match that 16 billion gallons.

So that was a terrific start. I think we have to put the second piece in place for completeness.

Senator SHAHEEN. So, one of the things that's being talked about as part the budget agreement is the fairly significant reduction in the DOE Loan Guarantee Program. What would that do to trying to do the follow on investment that is needed?

Mr. BRADY. It's about the worst possible thing that we could do for second generation ethanol and frankly for advanced biofuels. It's about the worst possible thing we could do. This Valley of Death, I know it's a bit of cliché. But I must tell the committee it's real.

The Loan Guarantee Program is the solution. It's a terrific solution. We just have to get it to work. We have to keep it. We have to get it to work.

Senator SHAHEEN. Thank you.

Mr. Eichberger, I apologize I missed most of your testimony. But I did hear you say that right now we can't recertify existing equipment and that that's one of the challenges, that we need to change that.

Do you have any estimates on what the cost differential would be if we could recertify and also maybe you could describe how challenging a process that would be?

Mr. EICHBERGER. Certainly. The current rules are you must be listed by a nationally recognized testing laboratory, such as Underwriters Laboratories. They have a very strict policy that once it's been manufactured and in the market they're not going to go back and retest it. Because they don't know what's happened to it since it's left. I understand that position.

The challenge is if I just put in a brand new system last month, but it wasn't certified and listed. It very well could be technically safe. Why should that not also be legally safe to do so?

We have been proposing that the EPA set up a system of issue guidelines for determining the compatibility of equipment. We think EPA is a right source to do that. They've come out with proposals say UL manufacturer tested or meeting the API recommended practice or some other.

If we meet those criteria they're legally safe, legally authorized. If there's a release, we're still on the hook for clean up. We're not asking for a get out of jail free in case we have a spill. We clean it up.

What we're hoping to do is avoid potential negligence claims for the simple fact we were using non-listed equipment. If we can move forward in that direction you can lower the cost of entry for a lot of retailers, not all of them. Because they have to know everything they have in the ground.

But you're going to lower the cost of entry. Maybe they just have to replace a couple seals and gaskets rather than replacing the entire system. It could be a much greater incentive to move into new fuels.

Senator SHAHEEN. Thank you.

Mr. Dinneen, do we currently have a tariff on imported ethanol? How does that affect the Blender's Tax Credit?

Mr. DINNEEN. There is a tariff on imported ethanol today. It is there to offset the tax incentive that refiners and blenders get when they utilize ethanol. I would note that Brazil also has a tariff that is in place today. So, you know, everybody is looking to ensure that the incentives that they're putting in place for domestic energy production is not exported.

Senator SHAHEEN. Thank you. Thank you, Mr. Chairman.

The CHAIRMAN. Senator Portman.

Senator PORTMAN. Thank you, Mr. Chairman. Thank you all for your good testimony today.

This is a great opportunity to learn more about, not just how we meet the standard that we've established in the 2007 legislation. But how we do it in the context of increasing budget deficits and an economy that continues to be weak coming out of the recession. So if you'd noted by some of the questions today already we're in a little different environment than we were in 2007 when incidentally our budget deficit was one tenth of what it is today.

We had a very different economic growth projection. I'm encouraged by the progress that has been made. It looks like between 10 and 12 percent of our oil imports have in fact been replaced by biofuels.

Mr. Dinneen, in your testimony you said that saved the U.S. about \$34 billion. In a way that's true. Again, I'm supportive of biofuels, but in a way you have to also look at, you know, who it saved.

It saved \$34 billion one way to look at it. Another way to look at it is when you add up the blender's credit, 45 cents a gallon. The tariff we talked about which I think is 54 cents. Fifty-four percent is the tariff now or 54 cents—

Mr. DINNEEN. It's 54 cents.

Senator PORTMAN. [continuing]. Per gallon and then I think there's a 2.5 percent tax as well. Of course the R and D funding through DOE which we talked about, Mr. Brady talked about. So at some point we have to just figure out what is the apples to apples comparison here.

Any thoughts on that?

Mr. DINNEEN. I happen to think that the existing Federal program for ethanol has been extraordinarily cost effective. I mean there are other things on that balance sheet.

The fact that the growing demand for grain is helping to reduce farm program costs, for example.

The fact that we are creating 70,000 jobs in direct employment and 400,000 jobs across the economy is also helping to add to Federal and State tax coffers.

If you look at the overall balance sheet, there's no question but that the investment that the taxpayers is making in this industry is paying dividends.

Yes, we have to be fiscally responsible. We ought to look at ways to reform these programs. But we ought not cut them off all together.

We can be penny wise and pound foolish. The fact of the matter is the only thing that we have today that is reducing our dependence on imported oil is ethanol. What is causing so much havoc in/throughout the entire economy? It is skyrocketing and volatile oil prices.

So if we don't get a handle on our dependence on oil and the consequences for our economy that result from it then that's the real fiscal issue we ought to be concentrating on.

Senator PORTMAN. Good points. Other thoughts?

Mr. Brady.

Mr. BRADY. I would more or less agree with Mr. Dinneen.

Senator PORTMAN. OK.

Let's talk a little bit about the next generation cellulosic ethanol. Again, coming from Ohio corn based ethanol is an incredibly important part of our economy as Mr. Dinneen said. In fact we have \$700 million now in annual sales. At least 210 jobs being created at a single facility, well at five different facilities.

I've had an opportunity to tour a couple of them. But the opportunities to move toward cellulosic ethanol do provide some economic benefits in theory and particularly wood chips that you're working on. Grasses, algae, we've talked about today.

What's the timing? We've had some optimism, you know, in the early part of the last decade about this. Then in 2007, I think there was optimism that we could meet the standard by corn based ethanol, but also a lot of other cellulosic sources more quickly perhaps than people think now.

But since you're in the business why don't you tell us what you think the real potential is? What's the timing?

Mr. BRADY. Yes. I think first we should address the issue of how long it's taking, as you bring up, Senator. I think there are really two things that happened since the 2007/2008 timeline.

One, of course, was the financial crisis which set these projects back.

Senator PORTMAN. Yes.

Mr. BRADY. Frankly speaking I think the rate of technological advancement at that time was a bit oversold. The technologies were not nearly as ready, I think, as they were advertised.

I can tell you now we have put together an Advanced Ethanol Council which I chair. I can tell you there are 10 members in there. A number of them have projects at about the level I just described, our Michigan project which is technology ready. Working on the financing, but facing this gap in financing and a way to close that gap.

So I think the industry has made significant progress. I think the most important thing we can do is to get the company's whose technology is ready to get these first plants built. They won't be perfect, but to get them built and to work the technology out and then proliferate quickly after that.

But we are very, very close.

Senator PORTMAN. That's what I think. In your written testimony, you talked about the Valley of Death of sort of getting to the point of commercialization and the need to move. You think there are a number of different technologies that are poised to make that leap?

Mr. BRADY. I do.

Senator PORTMAN. Let's talk about the blender credit and the fact that at the end of this year the tariff expires and there needs to be some kind of a decision made. Where are you, Mr. Dinneen, in terms of what you see as the right mix? You said earlier that the industry is looking to come up with something that meets the economic and fiscal conditions of the day.

What do you think that is? What's the right mix in terms of the tariff and in terms of the blender's credit?

Mr. DINNEEN. We've been working with the folks in the Senate and the House on a reform package that would essentially create a variable tax incentive that would recognize that at \$105 a barrel

of oil that you have today you probably don't need an incentive to encourage a gasoline marketer to use a fuel that is so much cheaper than gasoline. But recognize that there is volatility in this market. If you have a situation as you did just 24 months ago where you've got \$39 a barrel of oil.

Let's protect the investment that the taxpayer has made in this industry and make sure that there's something so that you are reducing the cost of these fuels in those circumstances. I think, quite frankly, given where most people anticipate oil prices are going to be that that would be a pretty fiscally responsible approach.

But it's got to be more than just, you know, the tax incentive. I think the things we've talked about here. You also do need to address a market. You need to make sure that there are vehicles capable of using more than 10 percent of ethanol blends so that when Mascoma is producing cellulosic ethanol there's a market for it.

You do have to have an infrastructure capable of delivering those fuels. I would caution folks that, you know, are enthusiastic about drop in fuels. I come from the school, we need it all.

These technologies are absolutely very promising. But there may not be any such thing as a drop in fuel. Until these things are produced you don't know what co-contaminants there are going to be.

The infrastructure investments that we're making will quite likely be necessary for those as well. Most certainly aren't going to be standard investments because they'll be able to use that infrastructure.

Senator PORTMAN. My time is up. I think it would be helpful to the committee to have, maybe in writing, what the blender tax credit range you're looking at when you talk about having a variable rate. It might be helpful for us although we're not the tax writing committee. I know the chairman and others will be looked at for input.

Thank you.

The CHAIRMAN. Thank you.

Senator Stabenow.

Senator STABENOW. Thank you very much, Mr. Chairman.

I want to indicate as Chair of the Agriculture Committee we held a hearing last week as well on this topic. I want to thank you for doing this. I'm looking forward to working with you on this both in the Energy Committee.

But also as we move forward on the next farm bill. As we look for ways to be able to strengthen the energy title of the farm bill and the cellulosic ethanol tax credit that came as part of the package with the farm bill last time to focus on advanced biofuels. I think is very important for us to be able to extend and to be able to work together on the issues that we're talking about today.

I firmly believe that biofuels ethanol, our opportunities around advanced biofuels are critical to provide competition to get us off of foreign oil. I mean, we need American, home grown, energy. We're talking about something this morning that will certainly be a major role in doing that.

Ethanol, corn based ethanol, is a maturing industry. Adding cellulosic is, I think, very important for all of us. Mr. Karr, I want to agree with you when said we're making great automobiles, by the way. We are.

Mr. Chairman, just for the note, it's our American companies winning all the awards last year. So it put a smile on my face and the hard working folks from Michigan that have been producing and making and engineering those vehicles. We're very proud about that.

But let me talk about, sort of, those two pieces. Because, you know, there's no question reducing dependence on foreign oil is an incredibly important. Moving to cleaner, renewable fuels are very important for many, many reasons.

It's also important to continue what is happening in our American automobile industry. The great work that's being done, the progress, the jobs being created, the vehicles that are highly efficient, creating more options for consumers. We're hearing a lot of concerns about those two goals being in conflict or not being able to be addressed together in terms of policy priorities particularly in light of the upcoming café rules and the debate about higher ethanol blends.

So I'd like to ask anyone who would like to respond on the panel to talk about these two goals and the extent to which we can move forward and make this a win/win and resolve any conflicts right now in our ability to meet those goals.

Mr. KARR. Thank you for that question.

I would take slight issue with one of Bob Dinneen's earlier statements that the only we're doing to lessen our dependence on foreign oil is in the biofuel space. Because, of course, auto makers are going to spend over \$50 billion between now and 2016 to significantly increase the fuel economy of our national fleet. We are in the process of talking to the Administration right now about fuel economy standards going from 2017 forward.

But with regard to the question of conflict between our various goals, it is true that the possibility for conflict exists. But I think part of my purpose in being here today is to at least lay out, from our perspective, an outline of an approach that we think could help to minimize that conflict. In addition to the fuel economy standards that we are looking at, we're also facing, you know, significant ratcheting up of stringency of smog, on the smog forming emissions side.

So for our perspective it makes sense to look at this from a comprehensive way and incorporate how we move forward in the biofuels space as part of that overall package. I understand that there are a lot of details and that there are a lot of stakeholders at the table. But, you know, we are prepared to sit down and have that conversation.

Senator STABENOW. Thank you.

Anyone else on the panel?

Mr. Dinneen.

Mr. DINNEEN. I just think I'd agree. I think, look there may be some potential for conflict. But I think if we're sitting down and working through some of these issues we can determine a policy that makes the most sense.

I actually agree with Mr. Karr about the conservation. That's certainly a part of what needs to be in the mix. I come from the school that we need all energy sources. That our energy situation is such that we ought not be saying no to anything right now.



So I think, you know, the statement that he made earlier about sitting down with stakeholders and trying to determine what is the most appropriate level and timeframe is something that's a conversation that I want to engage in today.

Senator STABENOW. Great.

Mr. EICHBERGER. Senator, if I may?

The thing that was missing from the 2007 energy discussions and the RFS was kind of a topic of today's hearing is infrastructure. Now we're trying to play catch up. So any discussion as we move forward we're more than willing to sit down and talk about it.

We want to make sure that infrastructure remains important because you can produce all the fuels you want. You can produce all the cars you want. But if you can't get the fuel into the cars—

Senator STABENOW. Right.

Mr. EICHBERGER. It makes no difference.

Senator STABENOW. Right.

Mr. EICHBERGER. So.

Senator STABENOW. Yes. Thank you very much.

I know my time is up, Mr. Chairman. I would just again say to Mr. Brady, we are excited about your coming, Mascoma, working very hard to come and create the first commercial scale cellulosic facility in the upper peninsula of Michigan. Looking forward to working with you to make sure that we can have the right policies in place and continue those to allow you to be successful.

Mr. BRADY. We can't wait to have you up there for the ground breaking.

Senator STABENOW. I'm ready.

Mr. BRADY. Great.

Senator STABENOW. Thank you.

The CHAIRMAN. Senator Hoeven.

Senator HOEVEN. Thank you, Mr. Chairman.

I'm going to start my questions along the lines of Senator Murkowski because I think she's right. The challenge is dollars. As you know we're a little short of dollars here, spending more than we're taking in and that's a problem that we've got to change.

The other is mandates. I've always found that people react better if you ask them to do something then if you tell them they have to do something. So I think incentives work better than mandates.

Big fan of blender pumps. Believe in flex fuel vehicles. Both give consumers choice.

I also believe in simple is best. Enhance of EPA can come out with higher blends and said that all vehicles can use it including small engines, large engines. It's a lot easier for your retailers than if some can use it and some can't.

Sixty-two percent on and on, it's got to be a certain year and so on and so forth. It makes it pretty hard for your retailers to set up their pumps to serve everybody on a cost effective basis. When some can use it and some can't.

Now you've got all your labeling requirements and a lot of other confusion. I think one of the biggest problems in terms of the Federal Government is they're making things more complex instead of making it simple. So I appreciate some of your recommendations in that regard.

With that in mind I'd like to ask each one of you. Given the financial constraints and all of the mandates how do we effectively, most effectively, maybe your one or two best concepts, get more flex fuel vehicles out there. Get more blender pumps out there and get this higher blend standard so we simplify the process to expand the use of biofuels.

Mr. Brady, if you would start? Run right through it.

The other question I'd add and throw something in there on it. This relates, of course, to what you're doing. Is how do we migrate to this second generation biofuels, to cellulosic and so forth?

I know Senator Portman talked a little bit about corn and the need to move to next generation. So if you'd touch on those two things. Your best one or two ideas, I'd like to hear them.

Mr. BRADY. Senator, on your first question, having the least amount of time to think about it I would say two things. I think we do need to reform the Vtech, the current tax scheme for biofuels. I think we need to reformat.

I think it needs to be more oriented to next generation, diversifying the feed stocks and better environmental performance. So I would start there. I would start with that pot of money.

The other thing I would say. The Loan Guarantee Program, by the way, I don't think we need more money. I think we need the money that's been put aside for the current DOE Loan Guarantee Program to be more effective.

So I think on both of those things there are existing programs that can work a lot better in helping this transition from first to second generation.

Senator HOEVEN. Good example of what I'm asking for. The squaring makes a difference, but loan guarantees is a good example. Maybe the kind of thing we can sell. So appreciate that.

Mr. BRADY. Yes.

Senator HOEVEN. You'd made that comment earlier.

Mr. BRADY. Yes, sir.

Senator HOEVEN. Thank you.

Mr. KARR. In the vehicle space one of the policy options that Congress has pursued that doesn't cost is to allow auto manufacturers to earn credits toward meeting their fuel economy standards through the production of FFVs. In 2007 in the Energy Independence and Security Act, Congress had put those in place through 2020. In the last round of fuel economy rulemakings the Administration is phasing those out in 2016 unless we can demonstrate that biofuels are actually being used in those vehicles.

So I think there's room to have more discussion about that type of incentive both, legislatively and in the regulatory arena.

Senator HOEVEN. Alright.

Mr. DINNEEN. Senator, we've talked already about how we certainly are committed to reforming the tax incentive and doing it in a way that is fiscally responsible. So I'll leave that alone.

I'll say that moving forward you got to have a market. I give great credit to Ford and General Motors and Chrysler that have committed the 50 percent of the vehicles that they will produce in 2012 and later are going to be flex fuel vehicles. That is a tremendous commitment.

We need to figure out a way to get the other auto manufacturers to match the commitment of the U.S. companies. Whether that's a café credit or some other sort of—

Senator HOEVEN. Yes. How do you do it without a mandate? I mean, what ideas, without a mandate.

Mr. DINNEEN. Mr. Karr has mentioned the café credit. That will certainly create other issues. I mean, it's—there are no easy policy options here. If, you know, the challenge is finding something that you say, not a mandate. Mandates wouldn't cost anything.

Senator HOEVEN. But the café credit is a good example.

Mr. DINNEEN. Yes. The café credit would. But there would be other issues, you know. But it's certainly worth exploring.

The other thing though, you need to figure out a way to get more blender pumps out there. John may have some ideas on that that don't involve money. I think his notion that, you know, just making sure that we can recertify existing equipment is certainly one we ought to be looking at.

Senator HOEVEN. I agree. That's a good example, John, that I wrote down when you brought it up earlier. Other ideas?

Mr. EICHBERGER. That's the critical one. I believe there's a lot of retail facilities out there that could move into higher blend of ethanol if it was lawfully allowed to do so. It's a matter of recertifying that equipment and making sure that we can do without retribution.

Senator HOEVEN. So not only certification, but some kind of recertification where somebody comes in and looks at it and says this is fine for E15 or?

Mr. EICHBERGER. Right. Yes. Some way to have the legacy equipment that's at retail facilities eligible to sell new fuels. Then as we increase supply of ethanol and other renewable fuels we increase the demand of flexible fuel vehicles.

More retailers will look at this as an opportunity to service our customers without a huge investment in resources. If we can do this, you can eliminate the need for any type of government support for new equipment by allowing retailers to use what's already in the ground.

Senator HOEVEN. Thank you.

The CHAIRMAN. Senator Cantwell.

Senator CANTWELL. Thank you, Mr. Chairman and so many of the witnesses. I was going to ask a question about the Loan Guarantee Program. But so many of the witnesses and my colleagues have mentioned the Loan Guarantee Program that I just want to say that yesterday I sent a letter with the chairman and my colleagues, Senator Landrieu and Wyden and Coons and Johnson and Shaheen, urging that Senator McConnell and Reed not consider any HR1 language in the continuing resolution that would gut the Loan Guarantee Program.

This is about 58,000 construction jobs, 30 billion in clean energy projects and I think it's very important that we make sure that the CR does not include that gutting proposal. I think you all have done a good job this morning of discussing the whys of that. But just know that we are fighting to make sure that isn't part of a continuing resolution.

I also want to associate myself with my colleague, Senator Murkowski about ethanol. I never understood why the ethanol—I understand why the ethanol producers have some anxiety about lifting the tax barriers on ethanol. But at the same time I think it would have helped create the market faster and allowing that import.

But I want to go to this question of gas prices and how alternative fuel—what we really need to be doing to drive down, you know, the price. I mean, Brazil was staring at \$147 oil and basically had the ability to have 90 percent of their vehicles be flex fuel vehicles. So when the price spiked they just turned over to their domestic production. So they basically insulated their economy from those gas spikes.

Here we are with the same choice now saying we could move forward and insulate ourselves from those gas price spikes if we gave ourselves an alternative to the monopoly that is currently oil and particularly foreign oil. So, first I wanted to ask Mr. Karr, were there any technical or economic hurdles for making those flex fuel cars for the Brazilians?

Mr. KARR. No. I don't think the concern is that we can't make flex fuel vehicles. As I said in my testimony, we're in support of a flex fuel technology and have put over 8.2 million on U.S. roads today. So they're not technical hurdles currently.

There are potential technical hurdles having to do with the next round of smog forming emissions. But they're not technical—

Senator CANTWELL. Yes, different. We came very close. The Senate actually passed language as part of the 2007 energy bill that would have required 50 percent of cars to be flex fuel cars. But in the negotiations with the House, unfortunately, that provision was dropped.

So but as far as the fuel though, if we had a fleet like that do you think that the alternative sources could help us drive down the price? How do you see the price? I mean, maybe Mr. Dinneen, how do you see current alternative fuel prices, you know, compared to gasoline today?

How do you see that for the future? Particularly if we had, you know, a 50 percent fleet or something like that?

Mr. DINNEEN. Senator you're absolutely right that Brazil has insulated itself from those energy shocks by just giving its consumers the flexibility. The flex fuel vehicles are about 50 percent of the automotive fleet in Brazil. The rest of the vehicles run on a 25 percent ethanol blend. So, I mean, they have maximized their use of renewable fuels. It's a heck of a program.

Their 50 percent of the fleet, you know, compares to our 3 percent of the fleet being FFV. So we do need to do far more. If we are able to there's no question that we'll continue to have a beneficial impact on gas prices. I say continue to have because as I said, ethanol today is driving down the price of gasoline.

It's a little hard to really recognize it when you got \$4 a gallon. But because ethanol today is 50 cents cheaper than gasoline it's already driving down the price of motor fuel and just by the fact that we have 13 billion gallons of domestic renewable fuel adding to our gasoline pool. That is driving down the price of fuel generally.

So the economists have generally said that the 13 billion gallons of ethanol that we're using today is responsible for 15 to 50 cents reduced price on gasoline. If there's more FFVs, if there are more biofuels, when we get to the point when there's 36 billion gallons of fuel from domestic renewables in this country gasoline prices will have to moderate. No question.

Senator CANTWELL. So the faster that we can go on that, the more we're going to see a drop in gasoline prices. I think that's the headline for today. I mean, consumers all over America want to know.

I mean, I personally think the era of cheap oil is over and that all we are now is on the roller coaster. So this is about whether we're going to allow the U.S. economy to be continually subject to that level of volatility and/or are whether we're going to produce something that is going to take that monopoly and give it some competition.

So I appreciate your testimony today about this. Thank you, Mr. Chairman for the hearing.

The CHAIRMAN. Thank you very much. We appreciate all of you being here. I think it's been excellent testimony.

We do have one additional panel which is the Representative from the Department of Energy. Dr. Henry Kelly, the Acting Assistant Secretary in the Office of Energy Efficiency and Renewable Energy. So we would ask him to please come forward and give us the Administration's perspective on this set of issues.

Please go right ahead.

**STATEMENT OF HENRY KELLY, ACTING ASSISTANT SECRETARY, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, DEPARTMENT OF ENERGY**

Mr. KELLY. Thank you very much, Chairman Bingaman, Ranking Member Murkowski. Thank you again for inviting me. I'm here to discuss the Department of Energy's biofuels program and the Biofuels Market Expansion Act of 2011.

Transportation is obviously a key part of the U.S. energy economy. It's two-thirds of the United States oil consumption and one-third of the Nation's greenhouse gas emissions. After housing, it's the second biggest monthly expense for most American families.

As the President said last week in an economy that relies so heavily on oil rising prices at the pump affect everybody and biofuels are clearly a part of the American solution. Home grown biomass can provide a cost effective alternative to oil imports and create businesses and jobs throughout the U.S. economy including rural areas.

DOE is making investments in research and development of the next generation of biofuels. It is also working hard to create markets for existing and new technologies through new fueling station technologies and other methods. I'm pleased to report that we've made significant progress in this area. The Administration's FY 2012 budget proposes to maintain this momentum.

Now the Biofuels Market Expansion Act of 2011 addresses several key barriers to increase use of biomass. The bill would require auto makers to make an increasing fraction of their vehicles flex fuel and includes a number of other provisions to expand existing

infrastructure capable of handling higher ethanol blends. DOE is currently taking a number of steps, already, to address these exact challenges.

Prior to October 2010, the amount of ethanol that could be blended in gasoline for use in standard vehicle engines without modification was limited to 10 percent by volume. DOE has conducted extensive tests and worked closely with EPA to provide the data needed to determine the potential impact of E15. Again, that's gasoline containing up to 15 percent of ethanol by volume.

On compliance with the vehicle and engine emissions standards established under the Clean Air Act, EPA ultimately decided based on DOE and other test data analysis that E15 may be introduced into commerce for the use in model year 2001 and newer passenger vehicles once several considerations are met. This would allow the approximately 150 million vehicles that are on the road that are post 2001 and newer to be using E15.

Now DOE is also working with auto manufacturers to assess the viability of making new vehicles compatible with higher ethanol blends. DOE estimates that about 3 percent of the vehicles now on the road are already manufactured to be compatible with E85. Roughly 15 percent of the sales of new vehicles are also compatible with E85.

Most of these come from the domestic manufacturers who have committed to having 50 percent of their vehicles be compatible with E85 in model year 2012. The total average in 2012 is likely to be between 18 and 20 percent of all new vehicles. We estimate that the incremental cost of adding E85 compatibility to a new vehicle is between \$50 and \$100 per vehicle.

Moving to E15 and higher blends also requires making the fuel dispensers, the fuel pumps and underground storage tanks compatible with these fuels. DOE has been working with Underwriters Laboratories and pump manufacturers to accelerate production of new pumps that can operate with E15 and higher blends. Pumps capable of dispensing much higher blends, like E85, currently cost about 60 percent more than conventional dispensers or pumps. That's largely because of limited production volume. If these pumps were produced in quantity the differential cost could be down to a few hundred dollars per pump. We're also working to develop retrofit kits working with Underwriters Lab and the dispenser manufacturers to develop an inexpensive kit where you can build to an existing dispenser and retrofit it and get it approved.

The funding could be made available for this through our DOE's existing State Energy Program funding and through Recovery Act funding. We've informed the states that this is possible. The Department, of course, is willing to work with this committee on any new ideas for moving these retrofits and the incentive for new pumps compatible with higher ethanol blends forward.

As we take steps to break down the barriers to greater use of today's biofuels, DOE is also making investments into the next generation of biofuel technologies. The American Reinvestment and Recovery Act accelerated the investment in biofuels considerably. We were able to fund an additional 18 R and D projects which added to the 11 projects that were funded in 2007/2008. This has

allowed us to explore a number of very interesting new technologies on a significant scale.

These projects are helping scientists and entrepreneurs explore techniques for converting cellulose such as wood and corn stover waste to ethanol as well as technologies for converting corn and the cellulosic materials into drop in substitutes for gasoline diesel and jet fuel. To accelerate the development of these technologies, President Obama recently announced a goal of breaking ground on four commercial scale cellulose or advanced biofuels plants over the next 2 years. To meet this goal, the FY 2012 budget includes funding for both R and D and for a reverse auction which cellulose and advanced biofuel project sponsors would be able to compete for additional support.

With support for such plants, advanced conversion technology could play a significant role in the next few years, and we're supporting two main pathways to achieve advanced biomass. One is thermo-chemical based on pyrolysis or just gasifying material. The second is advanced biochemical techniques using enzymes and other methods. Over the long term we think that both of these show considerable progress and have the potential for driving prices down so that they're fully compatible with petroleum based fuels.

The President recently set of goal of reducing petroleum imports by a third by 2025. Together with increased fuel economy in vehicles and acceleration of electric vehicle deployments, biofuels are a critical part of our national effort to achieve this goal. The Administration is still formulating its position on the bill before this committee and welcomes the opportunity to continue working with the committee to advance our energy goals.

I'd be happy to answer any questions.

[The prepared statement of Mr. Kelly follows:]

PREPARED STATEMENT OF HENRY KELLY, ACTING ASSISTANT SECRETARY FOR ENERGY EFFICIENCY, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, DEPARTMENT OF ENERGY

Chairman Bingaman, Ranking Member Murkowski and Members of the Committee, thank you for the opportunity to discuss the Department of Energy's biofuels program and the "Biofuels Market Expansion Act of 2011" (S. 187).

The transportation sector accounts for approximately two-thirds of the United States' oil consumption and contributes to one-third of the Nation's greenhouse gas emissions<sup>1</sup>. After housing, transportation is the second biggest monthly expense for most American families<sup>2</sup>. As the President said last week, "In an economy that relies so heavily on oil, rising prices at the pump affect everybody." Biofuels are a key part of the solution. They can provide a costeffective alternative to oil imports that create business opportunities and jobs in the U.S. economy—including the economies in rural areas. The Administration has set a goal to help fueling station owners install 10,000 blender pumps over the next five years, to enable widespread use of E-15. DOE is supporting this goal through investment in research and development for the next generation of biofuels and new fueling stations technologies.

The Administration is focused on a range of challenges, and is prioritizing efforts that can accelerate the substitution of imported petroleum with home grown bio-based and renewable fuels. This requires a research and programmatic balance to help both new and existing biomass technologies permeate the market. I am pleased to report that we have made significant progress in this area. The Administration's Fiscal Year (FY) 2012 budget proposes to maintain this momentum.

<sup>1</sup> [http://www1.eere.energy.gov/vehiclesandfuels/pdfs/vehicles\\_fs.pdf](http://www1.eere.energy.gov/vehiclesandfuels/pdfs/vehicles_fs.pdf)

<sup>2</sup> <http://www.bls.gov/news.release/cesan.nr0.htm>

The “Biofuels Market Expansion Act of 2011” addresses several key barriers to increased use of biofuels. The bill would require automakers to make an increasing percentage of “flexfuel” vehicles, and includes a number of provisions to expand fueling infrastructure capable of handling higher ethanol blends. DOE is currently taking a number of steps to address these challenges.

Prior to October 2010, the amount of ethanol that could be blended in gasoline for use in standard vehicle engines without modification was limited to 10 percent by volume. Through extensive vehicle testing, DOE worked closely with EPA to provide data needed to determine the potential impact of E15 (gasoline containing more than 10 volume percent and up to 15 volume percent ethanol) on compliance with vehicle and engine emission standards established under the Clean Air Act. EPA ultimately decided, based on DOE and other test data and analysis, that E15 may be introduced into commerce for use in model year (MY) 2001 and newer passenger vehicles once several conditions are met. This would allow the approximately 150 million MY 2001 and newer passenger vehicles on the road today to fuel with E15.

DOE is also working with auto manufacturers to assess the viability of making new vehicles compatible with higher ethanol blends. DOE estimates approximately 3 percent (8 million out of approximately 240 million) of passenger vehicles on the roads today are already manufactured to be compatible with blends up to 85 percent. Roughly 15 percent of new vehicle sales are also compatible and domestic manufacturers have pledged to increase this fraction to 50 percent by model year 2012 (18-20 percent of total sales, including a few non-domestic models). DOE estimates that the per-vehicle cost is in the range of \$50-\$100/vehicle.

Moving E15 and higher blends also requires work to ensure that fuel pumps and underground fuel storage tanks are equipped to handle these fuels. DOE is working with pump manufacturers to accelerate production of new pumps that can operate with E15 and higher ethanol blends. While pumps capable of dispensing very high ethanol blends such as E85 currently cost 1.6 times as much as the conventional pumps (conventional pumps cost ~\$15,000, E85 pumps cost ~\$25,000) DOE analysis suggests that the cost differential could be driven down to a few hundred dollars if the high-blend pumps were manufactured in volume. DOE is working with pump manufacturers to develop and market retrofit kits to upgrade existing pumps to be compatible with E15. In addition, DOE is working with states, who are able to use State Energy Program or Recovery Act funding, to upgrade existing fuel pumps to be compatible with higher ethanol blends. DOE is also collaborating with the U.S. Department of Agriculture in this area. The Department welcomes the opportunity to work with this Committee to further encourage the installation of new pumps equipped to handle higher ethanol blends and to retrofit existing pumps.

As we take steps to break down barriers to greater use of today’s biofuels, DOE is also making investments in next-generation biofuels technologies. The American Reinvestment and Recovery Act of 2009 (the Recovery Act) accelerated investment in innovative biorefineries, providing funding for an additional 18 RD&D projects, in addition to the 11 projects previously funded in 2007 and 2008. Through these projects, DOE is helping scientists and entrepreneurs explore technologies for converting cellulose such as wood waste and corn stover, as well as technologies for products other than ethanol—including drop-in substitutes for gasoline, diesel, and jet fuel. To help accelerate the development of these technologies, President Obama announced a goal of breaking ground on four commercial-scale cellulosic or advanced biofuels plants over the next two years. To help meet this goal, the FY 2012 budget includes funding for a reverse auction in which cellulosic and advanced biofuels project sponsors would compete for additional support.

With support for such plants, advanced conversion technologies could play a significant role in a commercial biofuels market within a few years. DOE is supporting two main pathways to convert biomass into biofuels in a cost-effective manner: (1) thermo-chemical conversion, based on pyrolysis or gasification, and (2) biochemical conversion using enzymes, fermentation, and other mechanisms, including algae. Over the longer term, research advances showing promise in the laboratory could greatly increase the productivity and reduce the cost of biochemical processes using engineered yeast, bacteria, and other organisms.

The President recently set a goal of reducing petroleum imports by one third by 2025. Together with increased fuel economy in vehicles, and acceleration of electric vehicle deployments, biofuels are a critical part of a national effort to achieve this goal. The Administration is still formulating its position on the bill before this committee and welcomes the opportunity to continue working with the committee to advance our energy goals.

The CHAIRMAN. OK. Thank you very much.



Let me ask just a few questions here. Your statement about DOE is working with pump manufacturers to develop and market retrofit kits to upgrade existing pumps to be compatible with E15. How does that relate to the concern that we just heard from Mr. Eichberger about the difficulty in getting approvals or certification on pumps that people with convenience stores are faced with? How do those issues relate?

Mr. KELLY. We're trying to work through that exact issue. The first is to make sure that we have the technology that actually works and find whether we can get the kit itself certified. Then we have to find a way to work with people to make sure that they have a retrofit at their facility that meets all of the local and national regulations. We're working through that right now.

The CHAIRMAN. So what is the timeframe for getting that done?

Mr. KELLY. I will have to check with my experts. They are confident that we can at least begin testing in the next few months. I can get back to you with the exact schedule.

The CHAIRMAN. Yes, that would be useful to know how quickly that's going to happen.

[The information referred to follows:]

The Department can only supply estimates for the timeline because it does not control the critical tasks required to test and list (certify) retrofit kits with UL (Underwriter's Laboratory). The design of the kits is the responsibility of the dispenser manufacturers. The Department has agreed to pay for the required testing with UL once the manufacturers supply a suitable kit. Without Department support for the testing there would be no business case for either manufacturer to complete their design changes and testing expeditiously because the expected profit margin would likely not cover the initial investment. The Department is actively urging both dispenser manufacturers to come up with retrofit kits as quickly as possible and has been in continuous contact with UL to arrange for testing as soon as the kits are available. The testing is anticipated to take at least 16 weeks once it begins. At the current time, the Department is hopeful a retrofit kit will be available to test in several months, which could enable at least one listed retrofit kit by the end of the calendar year if no development issues are encountered and no testing failures occur.

The CHAIRMAN. Maybe you're not the right person to ask on this. But on some of the other issues that were raised here in the previous panel has the Administration taken a position on the current structure of subsidies that we have for production of ethanol as to what we ought to be doing with that?

Mr. KELLY. I know that they are in conversation with the Senate on this subject. I don't know that we have a firm position on this. We obviously went forward with the proposal for continuing funding this year, but—

The CHAIRMAN. What's your take on this whole business? We've had this focus here for some years now on developing the infrastructure and producing more vehicles that will be capable of using E85. That's something of a different mission or goal than trying to say let's just increase the amount of ethanol that we're blending into our fuel mix.

Does it make sense for us to keep pursuing this E85 idea? Instead of just saying, OK, we're going to go to E30 and have that be the standard in the U.S. or E25 or whatever the right figure is so that we don't have—we've got this bifurcated circumstance in here where we've just got EPA saying it's OK to use E15 if the car is of a certain vintage. It's OK to use E85 if you can find it.

But, it seems as though we really just haven't come down with a concrete standard here that everybody can plan against.

Mr. KELLY. We are trying to make sure that we have a diverse portfolio of options.

The CHAIRMAN. Usually that means ethanol or gasoline or electricity. It doesn't mean E15, E85. It seems like at some point having so much diversity and in the different mixtures is counter-productive.

Mr. KELLY. We haven't supported a particular mixture. We certainly have supported—

The CHAIRMAN. But I guess my guess my question is shouldn't you? Shouldn't the Administration say here's what we're going to have and everybody, the car manufacturers can plan on it. The ethanol industry can plan on it. The convenience stores can plan on it.

This is what it's going to be from now until 2020 or whatever date.

Mr. KELLY. The fact is the total amount of biomass that the U.S. can produce that would be not harmful to the environment or compete with food is probably about a billion tons a year. The question is how do you best want to use that. There are lots of markets including jet fuel and diesel which are things that the Department of Defense wants as well as vehicle markets.

It's premature to say that any particular use of this scarce biomass resource is clear to us at this point. We are optimistic that we're going to be able to convert the fuel into something which can be directly substituted for things like jet fuel. That's an attractive outcome.

The CHAIRMAN. Senator Murkowski.

Senator MURKOWSKI. Thank you. Thank you, Dr. Kelly.

You mentioned the competition between biofuels and fuel. I want to ask you a question about the competition with biofuels and water. I've got five different questions that I'm going to submit to you for the record.

But last week we had a hearing on several hydropower bills and discussion about the intersection, the nexus, between energy and water and how critical that is and in a hand out that we got from one of our witnesses here, Catch 22 water verses energy. This is Michael Webber.

He states, "The production cycle with biofuels from growing irrigated crops on a farm to pumping biofuel into a car can consume 20 or more times as much water for every mile traveled in the production of gasoline. When scaling up the water could well become the limiting factor." He speaks to the controversy in several cities or municipalities in Illinois that opposed an ethanol plant's petition to withdraw two million gallons a day to produce the ethanol. Resistance will grow as rancher's wells run dry.

Whether the proponents realize it or not any plan to switch from gasoline to electricity or biofuels is a strategic decision to switch our dependence from foreign oil to domestic water. Just because I've been thinking a lot about water we had some good testimony on this issue from Department of Energy. I'd ask you your opinion on this.

Are we, within the Department, looking critically enough at this issue? When we talk about these policies that will build out, the ethanol, the biofuels, in an effort for us to consume less oil and there's essentially a tradeoff here. Because we are moving to utilization of another commodity if you will, that of water, which is exceptionally valuable and also limited in many, many areas.

Can you just discuss that very quickly?

Mr. KELLY. I don't think this is something that can be discussed terribly quickly, but—

Senator MURKOWSKI. That's probably true. That's not a fair ask of you.

Mr. KELLY. No. It's a very serious question and one that we're examining. We would certainly be pleased to answer questions if you don't think that we're looking at it carefully enough.

But one thing that we're intrigued by is if you're moving to cellulose biofuels you can do things like take corn that was grown and use the seeds for fuel or food. But then there's stover, which is what's left over, and use that material to produce a fuel.

That doesn't add a lot of additional water, as you've grown the corn already. Some of these other crops can be grown in, like sugar canes and other things that are grown in places where they don't have a big impact. You certainly want your use of scrap material. Again, the material has already been produced for wood or pulp or paper, for some other reason you can use that scrap material. But as you start pushing to very large volumes then clearly you do have to take greater and greater care.

Senator MURKOWSKI. Do you think that our policies as we're talking about, you know, how we build this out? How we build out the biofuels? Are we looking at the issue of our water usage and the water nexus in the creation of energy, are we looking at that critically enough or are we moving to these policies and saying well it's important that we reduce our reliance on oil?

We're not factoring in sufficiently the issue of water.

Mr. KELLY. It is true that virtually every major energy facility, as I'm sure you discovered in this hearing, uses a considerable amount of water.

Senator MURKOWSKI. Some are worse offenders than others. Apparently the biofuels is one of the worst offenders, at least in the presentation that we had last week, so. But it is something that I worry that we are not focused enough on.

We're looking at exciting technologies. We're looking at ways that we can advertise that we are reducing our consumption on oil. But we are not factoring in the very critical assessment that must go on when we look at water and our water consumption, how that figures into the equation.

I'd like to know a little bit more in terms of what DOE is doing. Because it seems like a get a little bit from one hearing and then a little bit from another hearing. But I'm interested in understanding the nexus just a little bit more.

So if you can help us out with that I'd certainly appreciate it.

Mr. KELLY. Absolutely.

[The information referred to follows:]

EERE is doing extensive work to manage water use in producing renewable energy. For biomass, there are two primary concerns: production of the feedstock which may receive irrigation water, and the conversion of that feedstock into a liq-

uid fuel for transportation. EERE's work on feedstocks is focused on crops such as switchgrass that do not require irrigation. In contrast, about 14% of the total U.S. corn crop is irrigated, resulting in a weighted average irrigation requirement for the corn used to produce biofuels of about 67 gallons of water used for irrigation per gallon of ethanol produced (<http://www.transportation.anl.gov/pdfs/AF/557.pdf>). To convert biomass feedstocks to ethanol, about 3 to 7 gallons of water are used to produce a gallon of fuel ([http://www.swhydro.arizona.edu/archive/V6\\_N5/feature4.pdf](http://www.swhydro.arizona.edu/archive/V6_N5/feature4.pdf)). Water consumption in the conversion process is being reduced as one component of a broader set of efforts to improve the efficiency and lower the cost of ethanol production.

Solar photovoltaics and wind do not require water to produce electricity. For thermal technologies such as concentrating solar thermal power and geothermal, attention has been focused on using dry cooling systems that have minimal use of water, rather than conventional evaporative cooling. This was the focus of a report to Congress in 2009, "Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation" ([http://www1.eere.energy.gov/solar/pdfs/csp\\_water\\_study.pdf](http://www1.eere.energy.gov/solar/pdfs/csp_water_study.pdf)).

These activities reflect the focused work being done which includes water as an important component of a host of factors that must be optimized together in order to provide the most robust, cost-effective, sustainable energy solutions possible.

To brag a bit, we're working on photovoltaics and wind.

Senator MURKOWSKI. Right.

Mr. KELLY. Which fortunately don't require a lot of water. Some of these solar thermal ones, the original plants, do use water. But we're trying to minimize that in advanced designs.

Senator MURKOWSKI. Good. I look forward to discussing that with you. I've got some additional questions that I'll submit for the record.

Thank you, Mr. Chairman.

Thank you very much. I think it's been a useful hearing. We will adjourn the hearing at this point.

[Whereupon, at 11:30 a.m., the hearing was adjourned.]

## APPENDIXES

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### APPENDIX I

#### Responses to Additional Questions

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##### RESPONSES OF BILL BRADY TO QUESTIONS FROM SENATOR MURKOWSKI

###### CELLULOSIC SHORTFALLS

*Question 1.* Cellulosic biofuels have been slow to enter commercial production. When do you believe production will catch up to the annual volumes listed in the Renewable Fuels Standard?

Answer. The 16 billion gallon mandate included in the Renewable Fuels Standard is critical to attracting additional investment to build out the cellulosic biofuel sector. More than 10 cellulosic biofuel companies are very far along in plans to construct the first commercial scale projects. Assuming financing issues can be worked through, several of these facilities can be in production in 2013. At that point, the industry would need to build 20 facilities a year to meet the 16 billion gallon mandate in 2022. The construction infrastructure exists for this type of build out. During the peak of construction in the corn ethanol industry, over 1.5 billion gallons of production capacity was being put on line per year.

###### LOGISTICS

*Question 2.* In your written testimony, you note that Mascoma is planning to make 40 million gallons of cellulosic ethanol each year at the Kinross, Michigan plant. For perspective, can you explain how much material that will require each year? How many tons of biomass will be used to produce 40 million gallons of fuel?

Answer. The Kinross facility is situated in an area where annual growth significantly outpaces existing harvest. Even with our facility, the area will continue to have an annual growth surplus. Initially, this facility will use 1 million wet tons (500,000 dry tons) of pulpwood to produce the 40 million gallons in fuel. We expect our technology to continue to improve our yield over time.

###### PIPELINE

*Question 3.* In your testimony, you state that you support S. 187. Are you concerned that if an ethanol pipeline receives a loan guarantee and is ultimately constructed, it could affect the Northeast's market for cellulosic ethanol made by companies like yours?

Answer. The RFS2 caps corn ethanol at 15 billion gallons. The remainder of the RFS2 will be met with advanced and cellulosic biofuels including 16 billion gallons of cellulosic biofuels. Upon breaking through the existing blend wall, the cellulosic ethanol industry will make up these additional gallons.

An ethanol pipeline does not threaten this market. Instead, it could make ethanol an even more cost effective option in the fuel supply. This could help build out additional ethanol infrastructure that can be beneficial to cellulosic ethanol companies. That said, given the current federal budget constraints, we would prioritize an ethanol pipeline below other infrastructure issues including FFVs and blender pumps.

###### SUBSIDIES

*Question 4.* In considering a 10-year extension for the tax credit for cellulosic ethanol, we could quickly find ourselves in a situation where the costs become unsustainable. If this credit is extended, how could it be offset? Do you believe it should be phased down, or made variable with the price of oil?

Answer. Consistency of tax incentives in the next 10 years is critical to attracting investment for our first facilities. Investors are making investment decisions, in part, based upon expectations for continuation of tax incentives in the space. Given the history of tax incentives for the oil and gas industry, investors continue to evaluate whether the Federal government will provide similar treatment to advanced biofuel technologies. That said, after initial buildout of the industry is complete and as our production costs continue to come down over time, it would be natural to have a discussion about how to refine incentives put in place to spur initial investment in the industry.

#### PRODUCTION COSTS

*Question 5.* Your written testimony states that Mascoma's ethanol will be "cost-competitive" with oil at \$75 per barrel. You also urge a 10-year extension of cellulosic ethanol's production tax credit. Can you explain the apparent discrepancy? With oil currently above \$100 a barrel, shouldn't there be less of a need for a large, long-term tax credit?

Answer. Mascoma is cost-competitive with oil at \$75 per barrel when you include the cellulosic production tax credit. Our goal is to be competitive with \$50 per barrel oil without tax incentives as we continue to make developments in our technology. We believe we can hit this milestone within the next decade.

#### PLANT ECONOMICS

*Question 6.* Your Kinross, Michigan facility is estimated to cost \$350 million. Does that include your feedstock costs, your operation and maintenance costs, or any distribution costs? How much do you expect your next facility, after Kinross, to cost?

Answer. The \$350 million cost is the capital cost for our first facility. Capital costs will decrease for future facilities. We expect that a second green-field facility will see significant savings and cost \$300 million. Our feedstock, operation and maintenance costs will be \$1.50 per gallon at startup. We expect continued decreases in these costs over time.

#### REGIONAL VS. NATIONAL APPROACH

*Question 7.* Given all of the challenges associated with scaling up biofuels usage—ranging from production costs to compatibility with vehicles and infrastructure—would it make more sense to focus on a regional, rather than national, approach to deployment? After reaching the blend wall, would it be more cost effective to grow the market for biofuels in the Midwest before looking to expand it throughout the rest of the United States?

Answer. Use of higher blends is critical to meeting the levels of ethanol use mandated in the RFS2. This requires significant increases in both FFVs and blender pumps.

One recent analysis indicated that a likely way to meet the RFS mandate include:

- 1) All existing non-FFVs running on E15;
- 2) Automakers produce 100% of their cars as FFVs beginning in 2015; and
- 3) These FFVs run on E85 for 33% of the time.

This scenario argues for focusing FFVs and blender pumps in highly populated areas where the most cars and gas stations are focused. Rather than focus on the Midwest, policies should focus on fostering car and pump infrastructure in large urban areas where gasoline demand is greatest.

#### RESPONSE OF BILL BRADY TO QUESTION FROM SENATOR JOHNSON

*Question 1.* Can you elaborate on the infrastructure needs of cellulosic ethanol as compared with grain-based ethanol? If we build out infrastructure now for our current biofuel market, will this also accelerate development of a market for the next generation of biofuels from cellulosic sources?

Answer. Developing automobile and pump infrastructure is critical to the cellulosic ethanol industry. Investors understand the implications of the existing blend wall and want to know that there will be room in the transportation fuel marketplace for our product. Investors want to see ethanol infrastructure align with the RFS2 mandates.

## RESPONSES OF JOHN EICHBERGER TO QUESTIONS FROM SENATOR MURKOWSKI

## MISFUELING E15+ BLENDS

*Question 1.* In October 2010, a spokesman for your organization, speaking about the potential for misfueling with E15, said that, "The easiest way to remedy this situation is to mandate that everything's full-serve, that you do not allow the customer to have the opportunity to misfuel." Can you estimate what it would cost for every service station to revert back to full service? Do you expect that sort of shift will be necessary with blends above E10? If liability is not addressed for E15 or higher blends, can you discuss the negative economic consequences that could result?

Answer. With reference to the quote attributed to my NACS colleague, it is important to note that some have suggested that this may be the easiest "solution" to prevent misfueling, however NACS does not believe this is a viable nor effective option for a variety of reasons. First, the costs would be unsustainable. The average starting hourly salary for an entry-level convenience store employee in 2009 was \$7.67. On average, a convenience store is open 157.8 hours each week. To ensure that an E10+ dispenser was staffed full-time would require an additional \$1,210 per week in hourly wages paid, not including affiliated employment taxes. On an annual basis, this would require an additional \$62,920 per year. If every service station in the nation (159,006) employed one worker to provide full-service at just one dispenser, the cumulative cost to the industry would be \$10 billion.

Further, there are no assurances that a full-service E15 dispenser would prevent misfueling. There are many consumers who are unaware of the make and model of the vehicle they are driving, let alone the model year. It would be impossible for the station attendant to identify those vehicles authorized to use E15 from those which are not, and if the consumer is unable to accurately provide that information the chance of misfueling will remain. In addition, if there is an economic incentive to the consumer to fuel with E15 (the relative price of ethanol and the associated tax credits could yield a lower retail price for E15 vis-à-vis E10), the consumer may simply misrepresent the model year of the vehicle being fueled.

NACS believes there are no full-proof options available to prevent misfueling because any physical countermeasures would require retrofitting millions of vehicles. Consequently, NACS believes that the onus for ensuring compliance with Federal law should be placed on the individual responsible for introducing the fuel into the fuel tank, whether that be the self-service customer or the full-service attendant. Any liability for violating the Clean Air Act or for damaging the engine should reside with that individual. Compliance with the labeling program being developed by the Administrator of the Environmental Protection Agency should satisfy the retailer's responsibility to warn the consumer.

Failure to reform the liability provisions surrounding fuels like E15 to protect those not directly responsible for the misfueling (i.e., the retailer who complied with the labeling requirements of the EPA and any other party not involved in the act of misfueling) could dissuade many retailers from offering such fuels. Without reform, retailers could face fines from EPA for violating the Clean Air Act (fines can be assessed up to \$37,500 per violation), could be sued under the private right of action that exists within the CAA or could be sued by the engine owner for voiding the engine's warranty, damaging the engine or perhaps causing injury to the engine's user. Whether such lawsuits would be successful is unclear, but the retailer would have to expend significant funds to mount a defense and that might not be a viable option—in 2009 the average per-store pre-tax profit for a convenience store was only \$33,170.

## LIABILITY

*Question 2.* In your testimony, you note that misfueling liability and general liability exposure are some of the most important constraints for more ethanol entering the market. Can you explain what would happen if liability is not addressed before higher blends reach the market? Do you believe that fuel wholesalers and retailers may decide to not sell the higher blends? Who should be liable for any potential damages that result from higher ethanol/gasoline blends?

Answer. I believe my response to question one addresses the questions regarding what would happen if misfueling liability were not addressed prior to higher blends reaching the market and who should be liable for potential damages the result from misfueling. Exposure to such liability could very well prevent many retailers from offering higher ethanol/gasoline blends.

Smaller retailers who operate in markets where consumers are heavily vested in the agriculture community and where demand for ethanol is strong may decide to enter the market even in the absence of such liability reform. Their cost-benefit

analysis is very different from that of a larger operator who may operate in markets where support for ethanol is less robust. Large operators may determine they face higher risks of consumer complaints associated with such fuels and may determine their risk of liability might exceed the potential benefits of offering the new fuel.

The issue concerning general liability exposure is potentially more significant. The motor fuels industry is very hesitant to adopt new fuels or fuel additives that may at some point in the future be determined to be defective products. Recent experience, when fuels mixed with the additive MTBE were declared defective, resulted in multi-billion dollar class action lawsuits that are ongoing today. Legal expenses alone are in the hundreds of millions of dollars.

This experience will likely deter many of the larger companies from entering new product markets without some assurance that they will not be retroactively held liable if in the future it is decided to declare these fuels defective and revoke the authorization to sell them. For the outlets selling fuel under the brand of a refiner (representing about 50% of the retail facilities in the country), it is likely that the supply contract will prohibit that location from selling a product with more than 10% ethanol. The Energy Information and Security Act of 2007 included amendments to the Petroleum Marketing Practices Act to ensure that branded retail locations could sell renewable fuels provided they were sufficiently debranded—however, the definition of renewable fuels in this section applied only to E85. (PL 110-140 Section 241)

The fact that EPA has approved E15 for only a subset of the engine population raises concerns that the product may cause engine performance or safety issues. In light of this situation, the concern about potential liability associated with the manufacture or sale of this product is elevated. Consequently, absent meaningful liability reform (both misfueling and product liability) it is likely that a majority of retail facilities will not assume the risk of selling a new fuel.

#### TECHNOLOGY NEUTRALITY

*Question 3.* Near the end of your written testimony, you recommend that Congress “refrain from pre-selecting the ‘fuel of the future’ and allow the market to determine the product that will most benefit consumers and the economy.” Please expand on that statement. What would the policy look like if this recommendation was followed?

Answer. Currently, there are limited fuel choices available in the market: traditional petroleum products, ethanol and biodiesel. Other options are very limited in market penetration and do not show much promise to expand their market share. In such a situation, it is understandable that legislators would focus on promoting the expanded market development of products with which they are familiar.

Renewable fuel debates in Congress typically focus on the feedstocks used to produce the fuels. The Energy Independence and Security Act developed a renewable fuels standard based on feedstock and emission characteristics, limiting the market use of corn-based ethanol and providing a framework for cellulosic ethanol to support the program. However, whether ethanol is derived from corn, sugar cane or cellulose, it remains ethanol and presents the same infrastructure hurdles.

In setting future targets, Congress could establish a target for vehicle and equipment compatibility standards based upon today’s available options, perhaps setting a standard for an E40 fuel. If Congress proceeds in this manner, the resources available for developing alternative, innovative fuel products could evaporate and the possibility of new fuels that are more environmentally progressive and more compatible with existing vehicles and refueling equipment could evaporate with it.

NACS is very interested in the development of new fuel options and providing opportunities for consumers to determine which fuel products will power the future of our transportation needs. Congress can provide guidance by developing specific criteria that new fuels must meet (i.e., compatibility and performance standards), thereby providing engine and equipment manufacturers a target for compatibility without stifling innovation.

#### FUEL SALES

*Question 4.* In looking at state-by-state data on E85 sales, it appears that the presence of a pump and the availability of the fuel is no guarantee that it would be sold in significant quantities. Do you think we could face a similar situation with blender pumps, if their installation is mandated?

Answer. NACS believes you could face a similar situation with blender pumps, even if they are not mandated. The challenge with this transition to renewable fuels is that no vehicles are required to run on them. As I mentioned in my testimony, prior fuel transitions were 1) backwards compatible and 2) mandatory for new vehi-



cles. Retailers knew that the new fuel would be purchased because 1) every engine could use it and 2) new engines had to use it. That is not the case now, so consumer demand is very uncertain.

In most circumstances, fuel purchase decisions are driven by price. In a survey of 1,200 consumers in 2009, NACS found that 70% of consumers select their fuel retailer based upon price. We also found that 26% of consumers will drive 10 minutes out of their way to save as little as 3 cents per gallon. In such a market, the price of an alternative fuel will play a significant role in level of consumer demand.

Sales of E85 have been slow in many markets because it cannot be sold for a competitive price. Because ethanol has fewer BTUs per gallon, E85 delivers between 25-30% fewer miles per gallon. Consequently, for the consumer to break even E85 must be priced 25-30% below regular gasoline.

This is not always possible to do, and E85 sales suffer. Fuels like E15 will deliver miles per gallon that are more similar to regular gasoline, so the price differential may not need to be as severe. In fact, the mileage difference between E10 and E15 may be negligible while the price of E15, due to the relative cost of ethanol and the tax credit applied, may be more attractive. This could drive consumer interest.

However, the authorization to use E15 only in certain vehicles and engines, combined with the auto industry's warranties covering only up to E10 and the skepticism the auto makers have expressed about the fuel's use in legacy vehicles, could substantially dampen potential demand.

Retailers are aware of consumer perceptions and potential marketability of new products. Therefore, if the cost of entry to these new fuel products can be lowered by changing the certification procedures for equipment and providing liability protection for law-abiding retailers, more may be willing to try new fuels in the market. If the fuels are not accepted by their customers, the retailers' investment is minimal and they can revert to traditional fuels. However, if the cost of entry is substantial (new equipment may cost \$120,000 or more) the retailers' willingness to take a chance on a new fuel is considerably reduced.

#### E15 SALES

*Question 5.* Could you list all of the steps that you believe must be taken before fuel retailers will sell E15 at their stations? How many of those steps have been taken so far, and how many remain unresolved as of today?

Answer. To help answer this question, I have attached a document published by the Renewable Fuels Association outlining the numerous steps that must be taken to make E15 a lawful fuel for use in the market. I believe many of these steps are in progress, but have not yet been completed. I have also attached a March 24, 2011, letter from the Environmental Protection Agency outlining the steps remaining before E15 is a lawful fuel.

Assuming the fuel satisfies all of the criteria listed in the attached documents, the following steps are required for the retailer to offer E15:

1) Equipment.—Retailers must ensure all equipment satisfies federal and local requirements for compatibility. Regulations of the Occupational Safety and Health Administration require that “flammable and combustible” liquids be stored in equipment that has been listed by a nationally recognized testing laboratory, such as Underwriters Laboratories. Tank insurance policies, state tank fund programs, bank loans and many local regulations require compliance with this regulation. Consequently, the retailer must ensure its dispensers and underground storage tank systems are listed as compatible with E15. This could be complicated because there were no UL listed dispensers for ethanol concentrations above 10% until spring 2010. Further, many retailers are not the original owners of the facility and, given there are no requirements that underground storage tank system documents and details must be transferred at the time a facility is sold, many retailers may not know what specific equipment they have underground to determine if it is listed. The attached document from RFA references that such equipment “will have to operate on an exception basis unless or until equipment is listed.” There are no exceptions to the requirement that retail equipment be listed by a nationally recognized testing laboratory.

2) Demand.—Retailers must determine whether there is sufficient demand to justify the expenditure to secure compatible equipment. Only 3% of the vehicles in the market are flexible fuel vehicles manufactured and warranted to operate on E10+ fuels. Another 62% (2001 and newer vehicles) of the market is authorized by EPA to operate on E15, but the auto manufacturers do not support this decision and do not warranty their vehicles to run on this fuel. If the auto industry determines that use of E15 in these vehicles is acceptable, then a national marketing campaign will be essential to educate the consumers about the

appropriate use of E15 and drive consumer demand for the product. Then, the economic calculation for a retailer to invest in upgrades to sell E15 might more positively justify the decision.

3) Misfueling.—Retailers cannot sell E15 until the EPA finalizes regulations governing the labeling of E15 dispensers. NACS has learned that during the week of April 18, 2011, the Agency had submitted a final rule to the Office of Management and Budget. Once this rule is published, retailers will know what is required of them to provide appropriate notice to consumers regarding the authorized and prohibited uses of E15. However, these labels will not provide much legal protection to retailers. In the absence of legislation that gives these labels the force of law, retailers may still be subject to violation or litigation under the Clean Air Act if a self-service consumer misfuels a non-authorized engine with E15. Further, that customer might sue the retailer in the event E15 voids the engine warranty or causes engine failure. The retailer must comply with the labeling regime published by EPA, but without further congressional action many retailers may not be willing to accept the risks associated with consumer misfueling.

#### INFRASTRUCTURE COSTS

*Question 6.* In your testimony, you note that the blender pump mandate in S. 187 could cost nearly \$5 billion, and it could cost around \$70 billion to retrofit all dispensers and underground storage tanks. If equipment can be certified retroactively, however, how much could that reduce your industry's costs?

*Answer.* It is difficult to specify the savings associated with recertification since it is impossible for us to know what equipment each retailer has at their facility. However, recent studies indicate that the gaskets and seals in dispensers pose the greatest challenge to E15 compatibility for these units. Underwriters Laboratories cited these studies as rationale for retracting their prior statements that most E10 listed dispensers could safely accommodate up to 15% ethanol blends. Consequently, if retailers could retrofit their existing dispensers to eliminate the incompatible components, rather than spending \$20,000 on new dispensers their investment could be dramatically reduced.

With regards to underground storage tank systems, certain components are generally recognized as compatible with high concentrations of ethanol but they are not specifically listed as such. Recertification of these units could save retailers substantial sums.

In general, if the investment for any one retailer can be reduced from \$120,000+ to less than \$20,000, the potential for that retailer to enter the new fuel market is substantially increased. Likewise, the economic burden on government grant and tax programs designed to encourage such equipment would be dramatically reduced.

#### ATTACHMENT 1.—RENEWABLE FUELS ASSOCIATION

##### REGULATORY SUPPORT NECESSARY FOR HIGHER LEVEL ETHANOL BLENDS

The approval by the U.S. Environmental Protection Agency (EPA) of higher-level ethanol blends in gasoline is only the first step in the process of moving to ethanol blends beyond E10. As stated in the EPA's recent update on the E15 waiver application: "It's also important to remember that there are a number of additional steps that must be completed—many of which are not under EPA or DOE control—to allow the sale and distribution of E-15. These include but are not limited to: testing on dispensing equipment; changes to state laws to allow for the use of E15; and completion of the fuels registration process by industry."

Beyond the approval of the E15 waiver request by the EPA, there remain several regulatory challenges, including:

##### *EPA Fuel Additive Registration*

- All new fuel additives must be registered with the EPA under 40CFR79
- Registration process is the submission of evaporative and combustion emission species representative of the new fuel blend
- Health effects testing is underway for higher level ethanol blends

##### *EPA Extension of 1 lb. Waiver of Reid Vapor Pressure (RVP) Regulations*

- Nonattainment areas (areas required to use reformulated gasoline (RFG)) are granted a one pound per square inch (1psi) RVP waiver for blends containing nine to ten percent ethanol (40CFR80.27)
- RFG represents 35 percent of the market

- 15 percent ethanol blends do not increase the RVP greater than 10 percent ethanol fuel blends; however, to maintain the current unleaded gasoline profiles an extension of the 1psi RVP waiver is needed
- The RFA has submitted the request both in the E15 waiver request docket and in a separate letter (dated May 17, 2010) to the EPA

#### *EPA Detergent Certification Status*

- Currently, all gasoline is required to contain a minimum amount of detergent
- These detergents go through a certification process with EPA
- Additional amounts of ethanol are not expected to increase deposit forming tendencies of gasoline; however, this discussion is in the very early stage.

#### *Fire Code and Retail Fueling Sites*

- All retail fueling sites must meet both the local and state fire code
- Most state fire codes require “listed” equipment 2
- Underwriters Laboratories Inc. (UL)<sup>1</sup> has stated that the current listing is for ethanol blends “up to” but not including E15
- All tanks, pumps, dispensers, nozzles, etc. will have to operate on an exception basis unless or until equipment is listed

#### *Automaker Warranties*

- Each vehicle has an owner’s manual that includes a “Fuel Recommendation” section noting warranty implications
- No vehicle owner’s manuals recommend the use of ethanol blends above 10 percent
- Implications are that if there is equipment failure while using blends above E10, the vehicle warranty could be voided

#### *Fuel Specifications*

- States adopt ASTM<sup>2</sup> fuel specifications into regulation
- The current ASTM specification for gasoline (D4814) limits some of the volatility offsets to E10 which may be necessary for E15
- The current ASTM specification for fuel ethanol (D4806) is limited to use in 10 percent blends
- Current NIST<sup>3</sup> HB130 limits the ethanol content to 10 percent in all gasoline blends
- Technical representatives are currently discussing the necessary modifications to both the ASTM fuel specifications and NIST HB130

#### *Octane Certification*

- The Federal Trade Commission regulations and ~99 percent of all state fuel laws require that a fuel’s octane be certified
- Existing ASTM methods to measure and determine octane do not include, nor exclude, blends above 10 percent ethanol; however, test method precision is needed for these specific fuel blends.
- An ASTM task force is currently investigating the influence of higher levels of ethanol on gasoline’s octane and the measurement process
- RFA precipitated this discussion and an active participant in this data development

#### *Safety and Handling*

- There is no existing information on the safety and handling of ethanol blended fuels above E10
- Laboratory tests show that traditional fire-fighting foams (or, AFFF) can extinguish an E10 fuel fire
- The RFA is currently soliciting research support to evaluate the effectiveness of these same fire-fighting foams with E15 fuel incidents

<sup>1</sup>UL is an independent product safety certification organization that develops standards and test procedures for products, materials, components, assemblies, tools and equipment, chiefly dealing with product safety. UL also evaluates and certifies the efficiency of a company’s business processes through its management system registration programs. UL is one of several companies approved for such testing by the U.S. Occupational Safety and Health Administration.

<sup>2</sup>Originally known as the American Society for Testing and Materials, ASTM is an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services.

<sup>3</sup>The National Institute of Standards and Technology is a measurement standards laboratory which is a non-regulatory agency of the U.S. Department of Commerce.

## ATTACHMENT 2.—LETTER FROM THE ENVIRONMENTAL PROTECTION AGENCY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,  
OFFICE OF ENFORCEMENT AND COMPLIANCE ASSURANCE,  
Washington, DC, March 24, 2011.

John Eichberger,  
*Vice President, Government Relations, National Association of Convenience Stores,  
1600 Duke Street, Alexandria, VA.*

Charles T. Drevna,  
*President, National Petrochemical & Refiners Association, 1667 K Street, NW, Suite  
700, Washington, DC.*

Bob Greco,  
*Downstream and Industry Operations, American Petroleum Institute, 1220 L Street,  
NW, Washington, DC.*

Carl Boyett,  
*President, Society of Independent Gasoline Marketers of America, 3930 Pender Drive,  
Suite 340, Fairfax, VA.*

Dan Gilligan,  
*President, Petroleum Marketers Association of America, 1901 North Fort Myer Drive,  
Suite 500, Arlington, VA.*

Bob Dinneen,  
*President and CEO, Renewable Fuels Association, 425 Third Street SW, Suite 1150,  
Washington, DC.*

Re: Gasoline Ethanol Blends

DEAR MESSRS. EICHBERGER, DREVNA, GRECO, BOYETT, GILLIGAN, AND DINNEEN: The United States Environmental Protection Agency (EPA) has recently received a number of inquiries asking whether it is currently legal for retail gasoline stations to sell gasoline blended with more than 10% ethanol for use in motor vehicles and nonroad engines. EPA has granted conditional waivers to allow the use of gasoline containing between 10% and 15% ethanol (E15) in model year 2001 and newer light-duty motor vehicles. The conditions associated with EPA's waivers, however, have not yet been satisfied. Thus, the Clean Air Act (Act) currently prohibits the sale of gasoline containing more than 10% ethanol for use in gasoline-only vehicles and engines.<sup>1</sup> Selling E15 gasoline for use in certain gasoline-only vehicles and engines will only become legal when the waivers' conditions, including the elements discussed below, are met.

The conditions in the E15 waivers are designed to mitigate the potential for misfueling of E15 in vehicles, engines, and equipment for which E15 is not approved. These conditions include labeling requirements for pumps dispensing E15, product transfer document requirements, and participation in a compliance survey at fuel retail dispensing facilities to ensure proper labeling of dispensers. EPA has also published proposed regulations to promote the successful implementation of the E15 partial waivers. The proposed regulations parallel the misfueling conditions on the E15 partial waivers.

In addition, Section 211(a) of the Act, 42 U.S.C. § 7545(a), prohibits any fuel manufacturer from selling designated fuel, such as motor vehicle gasoline, unless it is registered with EPA. However, since the conditions associated with the E15 waiver have not yet been met, it remains illegal to blend more than 10% ethanol into gasoline sold for use in gasoline-only vehicles and engines. The Act does not, however, prohibit retail gasoline stations from selling gasoline blended with up to 85% ethanol for use in flexible-fueled vehicles or engines,<sup>2</sup> and it does not prohibit the sale of gasoline containing up to 10% ethanol for use in gasoline-only vehicles and engines.

Sections 211 and 205 of the Act, 42 U.S.C. §§ 7545 and 7524, authorize EPA to assess significant civil penalties for improper fuel blending. To avoid violations of the Act, EPA suggests that retail gasoline stations that sell gasoline blended with more than 10% ethanol for use in flexible-fueled vehicles or engines take appropriate steps to prevent gasoline-only vehicles and engines from being misfueled with fuel containing more than 10% ethanol.

<sup>1</sup> A "gasoline-only vehicle or engine" refers to a motor vehicle or nonroad engine that has been certified by EPA to meet emissions standards using gasoline containing up to 10% ethanol.

<sup>2</sup> A "flexible-fueled vehicle or engine" refers to a motor vehicle or nonroad engine that has been certified by EPA to meet emissions standards using E85 (85% ethanol and 15% gasoline), gasoline without ethanol, or any intermediate combination of gasoline and ethanol.

For example, the likelihood of violations can be reduced for a retailer selling fuel containing greater than 10% ethanol if the retailer affixes warning labels to all pumps dispensing this product informing the public that the product may only be used in flexible-fueled vehicles or engines. EPA encourages fuel providers to employ other strategies at their facilities that are cost-efficient and effective in further reducing the risk of misfueling.

If you have any questions regarding this matter, you may call Jeff Kodish, Fuels Team Leader, at (303) 312-7153.

Sincerely,

PHILLIP A. BROOKS,  
*Director, Air Enforcement Division.*

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RESPONSES OF SHANE KARR TO QUESTIONS FROM SENATOR MURKOWSKI

FUEL SPECS

*Question 1.* Near the end of your written testimony, you note that vehicles built to a certain fuel specification can “deliver better fuel economy, better performance, and more cost-effective compliance with emissions standards.” Can you explain what that means in more detail, and then explain the difference between a narrow specification—say, E30—as compare to a requirement that vehicles be able to run on blends up to E85?

Answer. Automotive designs are similar in this regard to almost any other product engineering design; the narrower the design considerations or real-world constraints the more optimally the product can be designed to function. For example, a vehicle that has to be designed to operate on a large range of fuel blends (blends up to E85) at many different operating conditions is designed and calibrated differently, and less optimally, than a vehicle that is designed to run on a single fuel.

There are many characteristics of a fuel. These include performance characteristics (such as octane) and chemical characteristics (such as sulfur content). Fuels with higher octane, when matched with engines/vehicles optimized to the higher octane, enable the engine to be more energy efficient and deliver better fuel economy through increased compression ratio. When a vehicle must be designed to operate on a large range of fuel properties, the powertrain can only be optimized for the worst case scenario—all other design points are less than optimal. A vehicle driver expects a smooth start-up of a cold vehicle and a smooth re-start of a hot vehicle followed by smooth acceleration every time and in whatever environmental conditions. Fuels with closely controlled distillation characteristics, typically represented by a lower drivability index, enable the vehicle to give the customer the warm-up drivability that is expected while at the same time meeting rigorous emissions standards.

Ethanol fuel provides another challenge because of the wide range of ethanol compositions in the fuels marketplace. Because ethanol content greatly affects gasoline volatility, the range of ethanol compositions increases the necessary calibration window and reduces optimization. Another example is the effect of sulfur in fuel on emissions performance. Sulfur is a well-known catalyst poison and fuels with low sulfur contents are essential to meeting in-use emissions standards. Lastly, in the case of an E85 flex-fuel vehicle, manufacturers must certify that the vehicle meets the standards on the entire range of fuel combinations which significantly increases the engineering workload and the vehicle cost beyond what would be needed with one fuel.

LEAD TIME

*Question 2.* In your testimony, you noted that the auto industry would need sufficient “lead time” to comply with legislation requiring vehicles to run on a higher ethanol blend. What do you consider sufficient lead time? How long would it take to engineer, and then begin to manufacture, vehicles that ran on a higher blend?

Answer. Manufacturers typically need about 5 years lead time to introduce products that are optimized to run on a new fuel blend. Primarily the lead time is required to optimize the combustion system for the characteristics of the new fuel to ensure satisfactory performance and durability. Lead time is also required to develop the emission control system for that specific fuel. This is especially important given that very low tailpipe emissions will be required under LEV3 and Tier 3 regulations. Also, it must be recognized that a manufacturer cannot redesign its entire product portfolio in a single year due to limited resources (people, time and money). Realistically, it would take about 4 additional years to optimize the entire product portfolio for the new fuel blend.

## LIABILITY

*Question 3.* You alluded to the need to address liability for any damages that result from higher ethanol blends. Could you explain your industry's position—or summarize the positions within your industry—on liability, and how you think liability would ideally be established for higher ethanol blends?

Answer. Addressing liability for misfueling is one of the most challenging issues with implementing higher ethanol blends into an existing market of engine products (vehicle, marine and off-road or non-road small engines) that were designed, tested, certified and warranted to E10. Trying to determine whether engine damage, especially in older vehicles or engines, is attributable to misfueling is complicated and costly. Fundamentally, no manufacturer wants to be at odds with a large segment of their customers. Widespread customer dissatisfaction with its product would be a bad outcome for any manufacturer, regardless of who is at fault.

Consequently, any move to bifurcate the market with higher blends of ethanol must be accompanied first and foremost by a serious and meaningful effort to prevent misfueling. Automakers believe that one of the significant advantages of a prospective approach to introducing higher level blends into the national fuel pool is that it gives engine manufacturers, fuel retailers and other stakeholders the opportunity to work together with regulators to develop adequate countermeasures to minimize accidental misfueling.

Nonetheless, no matter what measures are put in place, no mechanism guarantees that there will not be any misfueling. Automakers know from experience from the introduction of unleaded gasoline into the market that some level of misfueling is likely, whether it is intentional or not. In cases where consumers are inadvertently ignoring warnings or deliberately circumventing measures to prevent them from using blends that are not intended for their engines, manufacturers should not be forced to bear any liability, either for recalls or for damages.

## MISFUELING

*Question 4.* To help minimize the potential for misfueling with E15, the EPA has proposed a label to warn drivers not to put the fuel into older vehicles and other non-approved equipment. As proposed, do you believe that campaign will be sufficient to inform drivers about their choice of fuels, and sufficient to ensure that drivers do not misfuel?

Answer. In the case of the E15 waiver and the proposed misfueling rule, EPA's approval of E15 use in some existing vehicles is in direct conflict with manufacturer recommendations and warranties. Automakers currently design, test, certify, and warrant all non-FFV vehicles to E10. Thus, EPA's blanket approval of E15 use in 2001 model year vehicles and newer will likely cause significant confusion in the marketplace, regardless of label design or misfueling strategy. It is true that previous introductions of new fuels—unleaded gasoline, reformulated gasoline, low sulfur gasoline, ultra-low sulfur diesel fuel—also faced bifurcated markets and misfueling potential, but there is a critical distinction here: the new fuels were required only for new vehicles, which are a small fraction of the market, but they were all “backward compatible” for older vehicle use. In other words, all vehicles, old as well as new, could use the new fuel without adverse consequences. This is not the case with E15.

The Alliance views pump labeling as a necessary component of a misfueling strategy, but by itself, it will be insufficient to prevent misfueling by consumers, or potential damage to vehicle and non-vehicle equipment and emission systems. EPA concedes this point by using the word “mitigate” instead of “prevent.” The only question, then, is what will be the extent of the misfueling? EPA should postpone the introduction of E15 until the overall misfueling approach—including but not limited to labeling—is well developed, to enable affected parties such as automakers time to prepare. Such preparations may include, for example, the development and deployment of communication materials for customers.

## FFV COMMITMENTS

*Question 5.* It appears that automakers, anticipating greater volumes of ethanol production, could add flex-fuel capability to their cars and portray it as a competitive advantage. Please describe the Alliance's views on commitments to FFV production, as compared to government mandates. How many of your members have made voluntary commitments to produce flex-fuel vehicles? Is it reasonable to expect that more will make commitments in the future?

Answer. As indicated in my testimony, the Alliance is not supportive of government picking winners and losers among vehicle technologies. We believe consumers

should have the choice to purchase the vehicles that best suit their needs—whether they live in Alaska or Florida, in a large city or small town, or drive 5,000 or 15,000 miles per year.

In 2007, the CEOs of General Motors, Ford and Chrysler stated their intent to make 50% of their fleets for sale in the US capable of operating on blends up to E85 by 2012, provided that adequate fuel and fueling infrastructure exists to make those vehicles desirable to consumers. The caveat is often forgotten. While no other manufacturers have made similar public commitments, several others have introduced FFV models to respond to market demand or regulatory incentives.

If the FFVs produced by the Detroit companies alone actually used E85 rather than E10, the so-called “blend wall” would not exist. Instead, the average FFV on the road today uses about one tank of E85 per year. There are a variety of reasons for the limited uptake of E85, including availability of fuel, price and performance relative to a gallon of E10.

These challenges will not be solved simply by manufacturing more FFVs, which is why we believe it is time for a comprehensive review of how best to expand the use of biofuels in our nation’s fuel pool. Any future commitments to produce vehicles with particular features would be made only in conjunction with a comprehensive and cogent set of policies ensuring that such vehicles will be a value proposition for our customers.

#### FFV COSTS

*Question 6.* In your testimony, you note that “the cost of making vehicles flex fuel capable is also expected to increase in the next few years as smog-forming emissions requirements are tightened.” Please expand on that statement. How much do you think costs will rise?

Answer. California currently has a stringent emissions standard called PZEV (Partial Zero Emissions Vehicle). An examination of emissions certification data would show that no OEM has marketed an FFV certified to this standard. California has indicated that they are planning on extending standards of this stringency across the whole fleet, as has EPA. In addition, the new methane emissions standards have proven quite challenging. Meeting the new standards with E85 certification fuel will require a significant investment in precious metal and investment in or invention of new hardware. In some cases it is estimated that the piece cost of an FFV meeting the new standards could rise by up to \$500 and in other cases the cost is unknown because no technical solution currently exists. These challenges stem from the physical characteristics of ethanol and E85 and how they affect emissions in the first 30 seconds of the EPA emissions test.

#### RESPONSES OF SHANE KARR TO QUESTIONS FROM SENATOR TIM JOHNSON

*Question 1.* My understanding is that the difference between making a flex fuel vehicle and a standard vehicle is minimal in technology and cost. Further, you are currently making cars to fit Brazil’s FFV mandate. Why not accelerate the deployment of FFVs here in the United States? Are there any regulatory hurdles?

Answer. The widespread availability of competitively priced E100 in Brazil has prompted the Brazilian car-buyer to demand FFVs. Virtually all spark ignition vehicles produced in Brazil are FFVs. In view of this success the Brazilian government has not felt it necessary to mandate the sale of FFVs. In addition, Brazil has substantially different emissions standards than exist in the U.S. The adoption of Brazilian emissions standards by the United States and California would greatly ease the expansion of the FFV production in the U.S. Brazil sets much less stringent emissions requirements on E100 than exist for E22. For this reason, the incremental cost impact for E100 emission controls is negligible in Brazil. Also, on-board diagnostic regulations in Brazil are less constraining than in North America, further reducing the cost of FFVs in Brazil relative to the United States. Many have commented on the widespread marketing of FFVs in Brazil and asked why these cars cannot be sold here. Those advocates fail to realize that a variety of state and federal regulations preclude the sale of these vehicles in the U.S., even if the second fuel tank used in Brazil (a gasoline tank needed to start the vehicle because of the lower volatility of E100) was removed.

*Question 2.* If there are remaining concerns about the approach in S. 187, what policies could you support to ensure consumers have access to vehicles that have the flexibility to run on clean, alternative fuels? Would you support a consumer-based tax credit or rebate similar to what is available for the purchase of electric vehicles?

Answer. As mentioned in my testimony, the Alliance supports FFVs as one important technology to reduce our use of imported oil. Your question implies that FFVs are not available for consumers who want to purchase them. There are more than

8.2 million FFVs on our nation's roads, and we are selling close to a million new FFVs each year. There are a variety of reasons that existing FFVs are not using significant quantities of E85, including availability of fuel, price and performance relative to a gallon of E10. These challenges will not be solved simply by manufacturing more FFVs, which is why we believe it is time for a comprehensive review of how best to expand the use of biofuels in our nation's fuel pool.

Consumer-based tax credits, rebates and other incentives (such as CAFE credits) historically have helped make new technologies viable in the market. Recognizing that additional financial incentives will be extremely challenging in light of the significant and appropriate focus on reducing the deficit, the Alliance would be prepared to work with you or any other Senator on proposals to expand the use of biofuels.

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RENEWABLE FUELS ASSOCIATION,  
*April 18, 2011.*

Hon. JEFF BINGAMAN,  
*Chairman, Energy and Natural Resources Committee, U.S. Senate, Washington, DC.*

Hon. LISA MURKOWSKI,  
*Ranking Member, Energy and Natural Resources Committee, U.S. Senate, Washington, DC.*

Hon. TIM JOHNSON,  
*U.S. Senate, Washington, DC.*

DEAR CHAIRMAN BINGAMAN, RANKING MEMBER MURKOWSKI AND SENATOR JOHNSON: The Renewable Fuels Association (RFA) appreciates the opportunity to respond to follow up questions from the April 7, 2011 hearing to review U.S. Department of Energy (DOE) biofuels programs and biofuels infrastructure issues, and to consider the Biofuels Market Expansion Act of 2011.

As I stated in my testimony before the Committee, getting more Americans behind the wheel of a car capable of utilizing higher ethanol blends is critical to our nation's energy goals and those of the Renewable Fuels Standard. The RFA is eager to begin this dialogue with automakers to permanently tear down artificial barriers to ethanol use. That means more flexible fuel vehicles, more conventional vehicles using blends above E10, and more blender pumps at gas stations. While differences in approach may exist, I believe we can find common ground that meets the needs of both our industries as well as satisfying the performance and safety needs of American drivers.

In addition to the responses below, I would like to respond to a line of questioning during the hearing from Ranking Member Murkowski on biofuels production and water use. The efficiencies adopted by ethanol producers have led to great improvements in the use of water. According to a 2010 study published in *Biotechnology Letters*, the average dry mill ethanol plant used 2.7 gallons of water per gallon of ethanol produced in 2008. That is down some 40 percent compared to 2001 and about half of the average water use in the mid-1990s. Further reductions in water use are expected in the near term, as new technologies promise to more efficiently use and recycle the water required for cooling towers, boilers and other processing components.

Ethanol's water use must be viewed in proper context. Consider that an average-sized modern ethanol plant uses less water per year than is used to irrigate a standard 18-hole golf course. Moreover, it takes 40 gallons of water to produce one cup of coffee; 4 gallons for a pound of hamburger; 11.6 gallons of water to produce a pound of chicken; and, 300 million gallons to produce just one day's worth of the newspapers across the country. Further, approximately 87 percent of all corn grown in the U.S. requires no irrigation. Nearly 97 percent of all corn used at ethanol bio-refineries is not irrigated, according to the National Renewable Energy Laboratory.

These gains in ethanol industry water efficiency stand in contrast with oil and other energy industries which are seeing their water profiles worsen. As easy sources of oil are exploited, more marginal sources of petroleum are needed. These sources, such as tar sands and oil shale, require far more water than conventional petroleum extraction and refining. According to the Pembina Institute, "For oil sands mining, approximately 12 barrels of water are needed to produce each barrel of bitumen in surface mined oil sands operations." Additionally, the water is so toxic following this procedure that it must be held in enormous tailing ponds until it is deemed safe to release.



Attached please find RFA's responses to questions from Members of the Committee. If there is any additional information you would like RFA to provide, please do not hesitate to ask.

Sincerely,

BOB DINNEEN,  
*President & CEO.*

#### RESPONSES OF BOB DINNEEN TO QUESTIONS FROM SENATOR MURKOWSKI

##### SHORTFALLS

*Question 1.* Cellulosic biofuels have been slow to enter commercial production. When do you believe production will catch up to the annual volumes listed in the Renewable Fuels Standard?

*Answer.* There are more than 50 cellulosic and advanced biofuel demonstration and pilot projects built, under construction or in scale?up in the United States. There are many more potential projects under consideration, hinging largely on whether Congress makes clear that it is standing behind its initial commitment to advanced biofuels. The technology for cellulosic and advanced biofuels is ready. Companies have demonstrated success and significantly reduced cost at each stage of the research, development and scale?up process. The industry is moving toward deployment of commercial?scale volumes to meet the RFS.

##### CELLULOSIC PRODUCTION

*Question 2.* Which company do you project will be the largest cellulosic ethanol producer in 2011? How many gallons of cellulosic ethanol will that company produce over the course of the year? Do you agree with the EPA's assessment that somewhere between 5 million and 17 million gallons will be produced their year?

*Answer.* The RFS was designed in part to ensure the evolution of America's biofuels industry is successful. By reducing the standard for cellulosic biofuels, EPA is accurately reflecting the difficulties cellulosic biofuel technologies have encountered in obtaining the capital needed to fully commercialize. However, being aware of this fact, EPA should have been and must be careful to keep cellulosic biofuel targets ambitious so as to stimulate the kind of investment these technologies need to finish commercialization.

##### LIABILITY

*Question 3.* During the hearing, liability for E15 and intermediate ethanol blends emerged as a significant, but unresolved, issue. Can you share your industry's perspective on liability? You urged the approval of E15 for all vehicles, which appears to indicate that your industry expects no damages to result. Would your industry be willing to assume liability in exchange? Please explain.

*Answer.* The liability concerns of marketers related to misfueling should not be summarily dismissed. There is liability already present every day at the retail station for fuels, safety, spills, and consumer education. In today's marketplace, gasoline and diesel present the same educational, safety and misfueling issues for consumers. No additional or unique challenges will exist with the introduction of new fuels, like E15.

The RFA will continue to work with marketers to address their concerns. The RFA has jointly supported legislation with the Petroleum Marketers Association to provide a pathway forward. In Iowa, Secretary of Agriculture Bill Northey is working with the industry and insurers to find a solution that may prove to be a model for other states. The RFA applauds his effort and any others to address these concerns. Ultimately, moving beyond E10 is critical to us all. Without expanded market opportunities, it will be exponentially more challenging to secure investments in the next generation of ethanol technologies.

##### LENDING

*Question 4.* During the financial crisis and economic recession, it was understandable that most large projects were unable to secure loans needed to move forward. Has this situation improved over the past year? Is it any easier to obtain credit for advanced biorefineries today?

*Answer.* Commercial development of advanced biofuels continues to be slowed by the recession. There are also acute financing gaps—often associated with the so?called Valley of Death—that are exacerbated by an unsettled, policy?driven and largely non?competitive U.S. fuel marketplace. The “financing gap” and “restricted

marketplace” problems must be addressed in order for our industry to reach its full potential.

#### FFV MANDATE

*Question 5.* You have endorsed a strong flex fuel vehicle mandate, but it is unclear whether enough biofuel will be produced over the next 20 to 30 years to justify requiring up to 90 percent of vehicles be able to run on E85. The EIA, for example, forecasts that biofuel production will reach 24 billion gallons per year in 2022 and 39 billion gallons a year by 2035. As welcome as those increased production levels would be, is it appropriate to mandate that nearly all vehicles be able to run on E85, when in most cases that fuel will not be available?

Answer. Flex fuel vehicles (FFVs) are designed to operate on ethanol blends up to 85 percent. Blender pumps, offering mid-level ethanol blends between E10 and E85, provide a unique opportunity for consumers to benefit from a new array of fuel choices at the pump. With just one piece of equipment, a petroleum marketer can offer a variety of new fuels to customers and these customers can select their preferred formulation with just the touch of a button. Even if a station does not wish to begin retailing new ethanol fuels immediately, the infrastructure is in place for the future for ethanol blends beyond E10.

#### E85

*Question 6.* Despite high hopes for E85 stations, and some growth in their number in recent years, E85 has not helped channel ethanol into the market to the extent that many expected. Can you offer any insight into why E85 has been slow to take off, and what would be necessary to increase its use?

Answer. The market for alternative fuels such as E85 is growing, driven by many factors, including fluctuating gasoline prices and energy security. With consumer demand for alternative fuel vehicles increasing, auto manufacturers are working to produce more FFVs. There are more than eight million FFVs on the roads today, and automakers will produce several million more each year. The number of E85 fueling stations continues to grow nationwide. As of early 2010, there are more than 2,600 retail stations (out of 160,000 stations nationwide), offering E85 across the country.

In order for the ethanol and E85 market to grow, we must also expand the fleet of FFVs able to use ethanol blends above E10. In his testimony at the April 7th hearing, Shane Karr, Vice President of Federal Governmental Affairs for the Alliance of Automobile Manufacturers, also pointed to the need to put more cars on the road that are approved to run on increased ethanol blends: “For our part, automakers would commit to a dialog with Congress and the appropriate federal agencies to discuss making our future light duty vehicles capable of running on gasoline/alcohol blends at a level higher than what is available today at E10, for model years beyond an established timeframe. The availability of the new fuel should coincide with the availability of the vehicles that can run on the new fuel, so there is a market for both.”

#### REGIONAL VS. NATIONAL APPROACH

*Question 7.* Given all of the challenges associated with scaling up biofuels usage—ranging from production costs to compatibility with vehicles and infrastructure—would it make more sense to focus on a regional, rather than national approach to deployment? After reaching the blend wall, would it be more cost effective to grow the market for biofuels in the Midwest before looking to expand it throughout the rest of the United States?

Answer. The Midwest has always been quick to embrace and expand the use of the biofuels that are being produced in the region. Most of the nation’s E85 consumption occurs within the Midwest, and the move to mid-level blends has already begun in the region. The overwhelming majority of blender pumps that exist today are in states like Minnesota, South Dakota, Iowa, and Wisconsin. We believe the Midwest region will continue to serve as the proving ground for expanded biofuels usage and an incubator for new bioenergy technologies. However, nearly 70 percent of the nation’s gasoline consumption occurs in coastal states. Thus, for biofuels to achieve their full potential in reducing imported oil consumption and stabilizing fuel prices, every state in the nation should be aggressively taking steps to expand the market for renewable fuels like ethanol. Additionally, many of the second generation biofuels facilities that are under development will be located outside of the Midwest and closer to coastal population centers. The most economical and efficient use of these second generation fuels would be in local markets. Accordingly, it is impera-

tive that the states where these new facilities are being developed join in the efforts to expand the market for biofuels.

RESPONSE OF BOB DINNEEN TO QUESTION FROM SENATOR TIM JOHNSON

*Question 1.* Consumers make choices about fueling their cars every day. They know not to put diesel into tanks and they make decisions about premium, mid-grade and regular based on prices. Can you comment further on the benefits consumers would see if they have the same type of choice with ethanol blends?

Answer. In its decision to limit the use of E15 to just 2001 and new cars and pickups, EPA has denied consumers choice in the type of fuel they use. Instead, they have chosen to continue giving oil companies a virtual monopoly over the fueling system. EPA continues to move in the right direction with respect to increasing ethanol blends, but challenges still remain.

Ultimately, EPA needs to make E15 available to all vehicles. 2001 and newer cars represent approximately 60 percent of the vehicle fleet. And while that's a good start and it will grow as newer vehicles replace the legacy fleet, it still leaves far too many consumers without an option to use E15 and it undermines the potential marketplace impact of EPA's decision. The analysis the RFA released last fall, prepared by the highly regarded automotive engineering firm, Ricardo, clearly demonstrated there is NO reason not to approve the use of E15 for vehicles older than 2001. There is no difference in emissions control equipment, materials compatibility, driveability or regulatory construct between a 2001 vehicle and an older model that would justify denying the opportunity to use E15 to all consumers.

A copy of the comprehensive engineering analysis performed by Ricardo, Inc., an internationally recognized engineering firm, is attached for the record.\*

RESPONSES OF HENRY KELLY TO QUESTIONS FROM SENATOR MURKOWSKI

R&D FOCUS

*Question 1.* In looking at the Department's recent budget requests, it appears that much of your focus is shifting from ethanol fuels to drop-in replacements. How advisable do you believe it is for Congress to consider strong mandates and large investments for ethanol infrastructure, considering that new fuels may soon emerge that affect the efficacy of those mandates and investments?

Answer. If federal support for ethanol were totally pulled out at this time, it would send a very negative signal to many in the cellulosic ethanol biofuels community and send a signal to others interested in the future development of other advanced biofuels. The Department has been a catalyst in terms of long-term federal research for cellulosic ethanol. The investments have been central to technology and industry growth as well as industry efforts to meet the Renewable Fuels Standard requirements. But even with the R&D strides that have been made over the years, securing cellulosic ethanol's place in the transportation sector—both as a blend and E85—will require strong markets for ethanol that are dependent on investments in vehicles, infrastructure, and safety.

In the near term, we need to be able to deliver ethanol for blending up to E15 throughout the whole United States. Retail infrastructure to enable higher level blends (up to E85) for use in Flex-fuel Vehicles (FFVs) will be required in the Midwest where the supply of ethanol is the greatest and will likely remain so even after additional biofields enter the market. Drop-in replacements for petroleum fuels that do not require significant infrastructure investment can also be an important addition to ethanol if the United States is to achieve its renewable fuel goals.

The Biomass Program has taken substantial steps to accelerate cellulosic hydrocarbon biofuels research, development, demonstration, and deployment (RDD&D) in the past few years, while maintaining robust R&D and deployment efforts on cellulosic ethanol. Much of our work on cellulosic ethanol can be directly applied to drop-in fuels or readily adapted to them, which should translate to faster development and deployment of drop-in fuels.

SMALL REFINERS STUDY

*Question 2.* The Energy Policy Act of 2005 directed DOE to complete an economic impact assessment before small refiners were folded into the Renewable Fuel Standard. After your Department issued the study in 2009, Congress declared it was not satisfactory, and required DOE to revise the study. It was due last year, but still

\*Document has been retained in committee files.

has not been released. In the meantime, the EPA has declared that small refineries are now subject to the RFS, even without a firm understanding of the costs that could result. Can you provide an update on this study? When will it be completed? Do you believe small refineries should be subject to regulation before its completion?

Answer. As of April 7, the report was in the final review stages at DOE. The study determined that certain refineries would experience disproportionate economic hardship if their exemptions were not extended. Based on the developed metrics and analysis, DOE recommended that thirteen refineries receive an extension of their exemption. As explicitly directed by EISA, EPA has notified the 13 affected refineries that the exemption from the RFS2 provisions has been extended for a period of 2 years.

#### BIOCHEMICALS

*Question 6.* Several companies believe that biochemicals are a better value proposition than biofuels, especially at the early stages of development. Has the Department focused on the potential of biochemicals? Going forward, do you intend to allow biochemical projects to compete for a greater share of biomass R&D funds than in the past?

Answer. The Department of Energy Biomass Program's current aim is to focus on replacing the entire barrel of oil with fuels and chemicals from cellulosic feedstocks. As a replacement for a large portion of the barrel of oil, production of cost competitive biofuels will continue to be the priority of the program because of energy security; however, there is renewed interest in including opportunities in bioproducts development subject to appropriations. In fact, the recent "Integrated Process Improvements for Biochemical Conversion of Biomass Sugars" funding opportunity announcement allowed for R&D conversion of biomass to bioproducts as a part of an integrated biorefinery.

#### CELLULOSIC COSTS

*Question 7.* The Department has set a goal of making sure cellulosic ethanol is "cost-competitive in the blend market" by 2012. Can you describe any progress towards that goal? Do you expect it will be met next year?

Answer. The Department is on track to meet the goal of cost competitive cellulosic ethanol by 2012. In 2010, DOE-funded research and development at our National Labs and in cooperation with the private sector resulted in a mature modeled cost<sup>1</sup> of \$2.70/gal for the thermochemical conversion route, which is a 17% improvement over 2009 costs and a 43% improvement over 2007 costs. The biochemical conversion route improved 13% from 2009 (24% from 2007) with a modeled cost of \$2.77/gal achieved. The technologies are expected to achieve modeled costs of \$2.05-\$2.15/gal by 2012, a cost range that is anticipated to be competitive with gasoline.

#### CELLULOSIC PRODUCTION

*Question 8.* Cellulosic biofuels have been slow to enter commercial production. Can you provide the Department's best estimate of when production will catch up to the annual volumes listed in the Renewable Fuel Standard?

Answer. The cellulosic biofuels industry is a new industry that is moving rapidly from demonstration scale projects to commercial facilities. The Department is working to facilitate this transition through our Biomass Program (financial assistance grants), the loan guarantee program (loans for commercial scale facilities), and the Office of Science (developing fundamental knowledge to support new technologies). In addition, we have included in our FY12 budget request a cellulosic biofuels reverse auction which would create a production incentive to reduce risk and encourage investment for "pioneer" cellulosic biofuels conversion facilities. These actions, together with the investments being made by the U.S. Department of Agriculture, provide government support to accelerate the start of this industry. There is also significant interest from the private sector, the aviation community, and the Department of Defense in biofuels.

<sup>1</sup> Mature Modeled Cost assumes cost and risk reduction over time as a process becomes more efficient. This is different from first-of-a-kind costs which are higher as a rule. The Department has design case reports that describe the "nth-Plant Assumptions" in Section 1.4 of the 2011 "Process Design and Economics for Biochemical Conversion of Lignocellulosic Biomass to Ethanol" (<http://www.nrel.gov/docs/infost/47764.pdf>).

## BLENDER PUMPS (I)

*Question 9.* Agriculture Secretary Vilsack has announced that USDA will help install 10,000 blender pumps over the next five years. S. 187 authorizes \$1 billion for a blender pump program at DOE. Do you believe it is necessary for two federal departments to carry out programs with the same goal? Is there an upper limit on the number of blender pumps that the federal government should help deploy?

Answer. On April 8, 2011, Secretary Vilsack announced in a statement that a “renewable energy system” in the Rural Energy for America Program (REAP) includes blender pumps. REAP primarily works with communities with populations of 50,000 or less and the grants apply only to farmers and small businesses in rural areas. These communities have fewer vehicles and many of those are typically older models. DOE recommends that these efforts include all communities, particularly those with higher populations. DOE has provided assistance to USDA in the form of technical support that includes safety issues and outreach and education materials for blender pumps. DOE has not requested funding for blender pumps in light of Secretary Vilsack’s announcement. Were USDA to lead the blender pump installation program, DOE would continue its collaboration efforts as needed. With regard to the upper level of blender pumps that the federal government should help deploy, we do not have a precise number, but believe that for these pumps to reach major populations a private manufacturer or manufacturers will need to capitalize on this business opportunity.

## BLENDER PUMPS (II)

*Question 10.* S. 187 would establish a grants program for blender pumps within the Department of Energy. Given that the Department’s primary focus is on feedstocks and biorefinery development, do you believe it is appropriate for the Department to administer this type of infrastructure deployment program?

Answer. DOE has administered infrastructure projects with fuels defined by the Energy Policy Act of 1992, better known as alternative fuels. Since Secretary Vilsack’s announcement to install 10,000 blender pumps, based on its experience with alternative refueling pumps DOE has provided assistance to USDA with technical support that includes safety issues and outreach and education material for blender pumps. In light of Secretary Vilsack’s announcement, DOE has not requested funding for blender pump installation projects. Were USDA to lead the blender pump installation program, DOE would continue its collaboration efforts as needed.

## ETHANOL PIPELINE (I)

*Question 11.* S. 187 would amend the loan guarantee programs to add a new category of eligible project—“renewable fuel pipelines.” Would the Department prefer a category that narrow, or instead a more technology-neutral approach for “transportation fuel infrastructure” that could include natural gas pipelines, hydrogen highways, and perhaps even clusters of battery recharging stations for electric vehicles?

Answer. The Administration does not have a position on this proposal.

## ETHANOL PIPELINE (II)

*Question 12.* S. 187 provides 90 days for the Secretary of Energy to promulgate regulations adding renewable fuel pipelines to the loan guarantee program. How long does the Department anticipate it would need to publish a final rule, develop a solicitation, and make any other programmatic changes or additions necessary to support a new statutory directive before the Department could begin soliciting applications? Is 90 days sufficient time?

Answer. This question is difficult to answer definitively and depends on a number of factors to include, for example: (1) how detailed the statute may be, (2) the amount of detail required in analysis and data gathering, (3) the number of outside stakeholders that are involved and how many comments they provide, (4) and the length of internal DOE and interagency review. Based on experience, the Department assumes the process to publish a final rule could take between 12 to 18 months.

## ETHANOL PIPELINE (III)

*Question 13.* Please list any hurdles that the Department has identified that could hinder the financing of renewable fuel pipelines under the Title 17 loan guarantee programs.

Answer. The Department has not undertaken the analysis that would be required to take an informed position on this issue.

## TARIFF

*Question 14.* Please summarize the administration's position on the tariff on ethanol imports.

Answer. This issue impacts several U.S. government agencies including USDA, Office of the U.S. Trade Representative (USTR), Department of Commerce, and State Department. There is currently no Administration position on this issue.

## RESPONSE OF HENRY KELLY TO QUESTION FROM SENATOR STABENOW

*Question 1.* I would like to ask you a question about coordination and streamlining. I think we all share a common goal on this committee to find solutions to decrease our dependence on foreign energy sources. This is a goal that is shared with many other government agencies.

As you know, I chair the Senate Agriculture Committee which oversees the Department of Agriculture's energy programs. One of my hopes as we enter Farm Bill discussions on the Ag Committee is to look at how to increase coordination between USDA and DOE to ensure that we are making sound investments and not duplicating efforts.

I'm specifically interested in ensuring that we take a comprehensive look at duplication and streamlining—not just within the department but across other agencies as well. Can you tell me how DOE is working with USDA to ensure that we are maximizing our resources and not duplicating efforts? For example, I know that USDA and DOE work together on the Biomass Research and Development Initiative (BRDI), and I would like to know what you are doing to coordinate on other programs.

Answer. The primary coordination mechanism between the Department of Energy (DOE), Department of Agriculture (USDA), and other Federal agencies in the area of biomass energy is under the Biomass R&D Act of 2000 (as amended). The Act consists of three primary efforts: an annual Initiative solicitation; the Biomass Research and Development Board, and the Biomass Research and Development Technical Advisory Committee. The annual solicitation is administered jointly by DOE and USDA, with staff from both agencies involved in each step of the process, including drafting the solicitation, announcing the solicitation, reviewing proposals submitted, and selecting/awarding meritorious projects. We believe that research programs are well coordinated and we work together on an as-needed basis for other programs (e.g. loan guarantee projects, etc)

The Biomass Research and Development Board<sup>2</sup> is an interagency collaborative composed of senior decision-makers from federal agencies and the White House, co-chaired by the USDA and the DOE. USDA and DOE annually implement the Biomass Research and Development Initiative<sup>3</sup>. The Board meets quarterly and currently includes members from the DOE, USDA, Department of the Interior, Department of Transportation, Department of Defense, the Environmental Protection Agency, the National Science Foundation, and the White House Office of Science and Technology Policy.

The Technical Advisory Committee provides external oversight of Federal biomass energy coordination by advising the Secretaries of Energy and Agriculture through the development of annual recommendations. These recommendations are developed at public, quarterly meetings during which the Committee interacts directly with DOE, USDA, and other Federal representatives, as well as members of the broader, non-public biomass community. The Committee consists of approximately thirty members from industry, academia, non-profit organizations, state agencies, and trade associations.

In addition to the formal coordination efforts that take place through the Board, DOE and USDA coordinate on a regular basis through other mechanisms. For example, DOE often includes USDA representatives on programmatic peer review and proposal application review panels, and vice versa. USDA and DOE/National Laboratory researchers work side-by-side on a variety of existing and proposed projects, including the Regional Biomass Energy Feedstock Partnership with the Sun Grant Initiative and the USDA-sponsored Coordinated Agricultural Project.

Both agencies (in addition to the Department of Defense, Environmental Protection Agency, National Aeronautics and Space Administration, National Institutes of Health, National Institute of Standards and Technology, and the National Science

<sup>2</sup> <http://www.usbiomassboard.gov/board/board.html>

<sup>3</sup> <http://WWW.USBi0MaSSbOard.g0V/initiatiVe/initiatiVe.htM1>

Foundation) participate on the Metabolic Engineering Working Group to stimulate increased awareness of this emerging field, which has great promise to improve the efficiency of biofuels production and to develop new means for producing advanced biofuels and other bio-based products. The group identified two major initiatives: announcements of interagency, rather than agency-specific opportunities for funding research grants, and the beginnings of a government-wide Metabolic Engineering Project Inventory.

RESPONSES OF HENRY KELLY TO QUESTIONS FROM SENATOR TIM JOHNSON

*Question 1.* It is my understanding that automakers are moving toward technologies that rely upon a fuel with high octane in order to meet the fuel economy targets. Ethanol is the cleanest source of octane available on the market today. Can you comment on the Administration's new fuel economy standards and how ethanol's octane benefits might help?

Answer. Automobile manufacturers are considering a range of different technologies to meet higher fuel economy standards. Several of these technologies could benefit from increased octane rating; in the past, they may have required high octane, but with advancements in modern engine design and controls, this may not be the case. While ethanol does increase octane, the finished gasoline will have a standard minimum octane rating based on its grade (i.e., no one will sell premium gasoline for the price of regular). Higher octane by itself does not increase fuel efficiency. Vehicles that do not require premium fuel will not benefit from increased octane, regardless of the source of the octane. Therefore, the Department views the primary benefit of ethanol to be petroleum displacement, rather than impact on octane.

*Question 2.* If we don't get behind the blend wall or if we pull federal support for ethanol as some have suggested, what implications would that have for developing the next generation of advanced biofuels? What would it mean in the larger context of our energy security and dependence on foreign oil?

Answer. If federal support were totally pulled out at this time, it would send a very negative signal to many in the cellulosic ethanol biofuels community and send a signal to others interested in the future development of other advanced biofuels. The Department has been a catalyst in terms of long-term federal research for cellulosic ethanol. Most recently, through the American Reinvestment and Recovery Act of 2009 (ARRA), DOE accelerated investment in innovative biorefineries, providing funding for 18 RD&D projects in addition to the 11 projects previously funded in 2007 and 2008. DOE is also currently addressing several key market barriers relevant to the "Biofuels Market Expansion Act of 2011," including restrictions on higher blends of ethanol in gasoline, by providing data for vehicle and engine testing that has helped assess ethanol use above the 10 percent level. DOE is also working with vehicle manufacturers and has received pledges from domestic manufacturers to increase the fraction of flexible fuel vehicles to 50% by 2012. DOE also recognizes the importance of blender pumps and associated underground storage for these higher ethanol blends, as well as retrofit kits to upgrade existing fuel pumps to be compatible with E15.

Within the larger context of energy security and reducing our nation's dependence on oil, continued support for cellulosic ethanol is critical. However, in order to reduce petroleum usage, we need to focus on displacement of the whole barrel, not just the portion that can be displaced by cellulosic ethanol. Only about 44% of a barrel of crude oil is used to produce light duty petroleum gasoline. About 25% is used to produce petroleum diesel fuel and about 17% is used to produce other petroleum products. Ethanol can be used to address the gasoline fraction of each barrel, and if ethanol's market is further limited by the blend wall, then only a fraction of that petroleum can be displaced. If we reduce total petroleum usage by substituting renewable fuels in one market, we need to think about how that impacts other markets. The most obvious issue is that we have to replace diesel and jet in proportion to gasoline, since their combined volume from a barrel of crude oil is approximately 1/4 that of gasoline, their markets are projected to grow significantly faster than that for gasoline, and refineries are constrained in the proportion of gasoline and diesel/jet fuel they produce. But other products are important, too. The largest chunk of the "other products" is the petrochemical industry, virtually all of which is based on crude oil and natural gas. If we do not replace the "whole barrel", we risk creating ensuing effects that will cause shortages or gluts in other markets, with additional economic consequences.

*Question 3.* It seems to me that if we deployed more FFVs and blender pumps as called for in S. 187, and urged EPA to continue phasing-out the dirty and carcinogenic aromatics (benzene, toluene, and xylene) the winner would be the American

consumer who would have access to cleaner, safer, and efficient fuel. Can you comment on the public health benefits of burning renewable fuels as compared with fossil fuels?

Answer. The combustion of gasoline generates many air toxic pollutants. When ethanol is blended with gasoline, the emissions from vehicles and engines change, with some pollutants increasing (such as NO<sub>x</sub> and acetaldehyde) and others decreasing (such as carbon monoxide). Aromatics and benzene emissions may also be reduced if refiners reformulate their gasoline to reduce its aromatic content by taking advantage of the added octane from the ethanol. In addition to changes in direct emissions it is important to point out that the emissions from combustion, and the resulting human exposure, are affected by many factors including chemical reactions, temperature, sunlight, clouds, wind, and precipitation. In particular, under some conditions the combustion of higher-level blends of ethanol has been estimated to increase some harmful emissions (tailpipe and evaporative) relative to conventional gasoline blends.<sup>4</sup> Both direct human-health effects and atmospheric-pollution effects are extremely complex; the “best” fuel may differ from one locality to another, and only continued improvement of our ability to model and measure these impacts will enable well-informed policy decisions.

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<sup>4</sup><http://www.stanford.edu/group/efmh/jacobson/E85PaperEST0207.pdf>



## APPENDIX II

### Additional Material Submitted for the Record

GROWTH ENERGY,  
*Washington, DC, April 6, 2011.*

Hon. JEFF BINGAMAN,  
*Chairman, U.S. Senate, Committee on Energy and Natural Resources, 304 Dirksen  
Senate Office Building, Washington, DC.*

Hon. LISA MURKOWSKI,  
*Ranking Member, U.S. Senate, Committee on Energy and Natural Resources, 709  
Hart Senate Office Building, Washington, DC.*

DEAR CHAIRMAN BINGAMAN AND RANKING MEMBER MURKOWSKI: As the country's leading advocate for ethanol, Growth Energy urges the Senate Committee on Energy and Natural Resources to swiftly approve legislation to expand biofuel consumption—such as S.187, the Biofuels Market Expansion Act, a bill introduced by Senators Tom Harkin, Tim Johnson, Al Franken and Amy Klobuchar. This legislation is designed to grow domestic demand for biofuels through the easing of market-restricting regulations and construction of infrastructure to deliver biofuels directly to consumers.

We applaud the Committee on holding today's hearing, and welcome the opportunity to discuss the impact that expanding ethanol infrastructure will have on securing our energy security and improving consumer choice at the pump. For too long, foreign cartels have manipulated oil production to the detriment of both our economy and the security of our nation. This Committee has before it the opportunity to begin to right the wrongs that have plagued our national energy policy despite the efforts of the last eight Administrations, dating back to President Nixon.

As a maturing industry, domestically-produced ethanol can do much more today to replace foreign oil in our transportation fuels market. However, if we fail to lift the artificial barriers that block ethanol from entering the market, we will continue a policy that mandates that 90 percent of our motor fuel be gasoline, two-thirds of which is derived from foreign oil.

However, we cannot help the American economy or our national security if ethanol is prevented from entering the market. This starts with allowing higher levels of ethanol in the fuel supply. The U.S. Environmental Protection Agency recently answered Growth Energy's Green Jobs Waiver, a regulatory petition to allow blends of up to 15 percent ethanol, or E15. After exhaustive and extensive engine testing, the EPA announced that E15 could be used in all vehicles built since 2001—that means every auto and light truck built in the last decade, a fleet which consumes about 75 percent of all fuel in the United States. Opening this market means increased access for our less-expensive, American-made, environmentally-friendly fuel. It means that instead of importing 7 billion gallons of oil from countries like Saudi Arabia, Yemen or Venezuela, we will use a cleaner, greener, more economical solution made right here at home. It also will create 136,000 new jobs in the United States; these are jobs that cannot be outsourced because they will be at ethanol plants and at the small businesses that are supported by the \$211 million in economic activity generated by the average 100 million gallon-a-year ethanol plant.

The second step is to require every automobile sold in the U.S. to be a Flex Fuel vehicle. We applaud domestic automakers for agreeing to make 50 percent of the passenger vehicle and light truck fleet flex fuel capable in the 2012 model year. But we believe a further expansion of Flex Fuel vehicles is warranted. In order to ensure that American consumers have access to the highest quality vehicles that allow a consumer to have a full choice at the pump of any gasoline or ethanol blend, we should require foreign automakers to comply with the path already laid out by U.S. automakers. This can be done at virtually no cost as these automakers already do it for the vehicle markets in foreign nations, such as Brazil, a country that has over

90 percent of their vehicle fleet flex fuel capable. Producing the same vehicles for the American market as well would not be a significant burden.

Additionally, every filling station in the United States should be encouraged to install Flex Fuel pumps—so-called ‘blender pumps’—that give the motorists the ability to choose their fuel blend. By incentivizing the installation of Flex Fuel pumps, we would give the consumer the first real choice in what kind of fuel they put in their car. We recommend a combination of infrastructure grants and tax incentives to gasoline retailers as the most effective way to address this issue.

If you give a driver a choice between ethanol—an inexpensive, home-grown, clean option—and regular gasoline, they will choose American-made ethanol. But for those who wish to use regular gasoline, they too will have that option. The installation of Flex Fuel pumps is about giving the consumer a choice, a choice that is currently made for them by requiring them to put at least 90 percent regular gasoline in their car.

Growth Energy also continues to support the construction of renewable fuel pipelines as outlined in the Biofuels Market Expansion Act. Our economic studies have consistently shown economic value for renewable fuel shippers, and thus for the American consumer, using a pipeline versus the existing rail infrastructure. These economic benefits rise over time as rail tariff rates increase on a congested rail system, even against the operating costs of maintaining a pipeline.

To be clear, Growth Energy is seeking simple parity with the oil and gas industry—we are not asking for the government to build pipelines, but because of the size and nature of such a project, we are seeking a federal loan guarantee of 80 percent of the cost in order to provide the certainty and stability to get the job done. A loan guarantee will also enable access to affordable debt financing. The Department of Energy completed a feasibility study in March 2010 and concluded that a loan guarantee was necessary to construct a renewable fuel pipeline. Without such a guarantee, the project cannot move forward.

It is also worth noting that these market infrastructure reforms will also encourage the development and deployment of next generation fuels like cellulosic ethanol by creating market space and certainty. A commitment to the transition is necessary for private market investments and innovation. The blend wall and petroleum mandate discourage next generation ethanol.

How significant an impact can ethanol make on gasoline prices with these market reforms? According to a study conducted jointly by McKinsey & Co. and the National Renewable Energy Laboratory found that ethanol reduces gasoline prices by at least 17 cents a gallon. Other studies have shown a consumer savings of 30 cents. These market reforms will only increase the level of consumer savings.

Further, the high-oxygen content of ethanol means it is better for the environment; the Yale Journal of Industrial Ecology published a peer-reviewed study that found grain ethanol is at least 59 percent cleaner than conventional gasoline in a full Life Cycle Analysis. And as the American ethanol industry continues to innovate—by using renewable energy sources at the plant and precision farming techniques—we continue to drive more reductions in greenhouse gas emissions.

Finally, a study completed by the Windmill Group found that as many as 600,000 American jobs depend on the U.S. ethanol industry. We could create more jobs, especially in hard-hit rural communities, if artificial barriers to the market are lifted, and if policy is changed to encourage the development of infrastructure—particularly the installation of Flex Fuel pumps—in order to give consumers a choice in their fuel.

Growth Energy fully supports the Biofuels Market Expansion Act of 2011, S. 187, and encourages the Committee to swiftly approve this bill and others that would expand biofuels programs and infrastructure. Thank you in advance for your consideration of our comments. We look forward to working with the Committee on these important issues.

Sincerely,

TOM BUIS CEO,  
*Growth Energy.*

PROPEL,  
Redwood City, CA.

WHITE PAPER

ALTERNATIVE FUEL INFRASTRUCTURE DEVELOPMENT

*Objective: Modify and expand the existing federal income tax credit to assist with offsetting the costs associated with the storage and dispensing of mid/high level renewable ethanol blends used as alternative fuels.*

*Outline:*

1. The tax credit should be expanded to offset up to 50% of the total cost of the improvements necessary to store and dispense renewable alternative fuels, not to exceed \$100,000 per site.
2. An applicant should receive the tax credit based on the entire cost of the alternative fuel improvements, not simply the incremental cost of the alternative fuel equipment as currently allowed by the IRS.
3. The alternative fuel infrastructure income tax credit should be transferable and exempt from the Alternative Minimum Tax.
  - a. Transferability will assist the large number of single store operators who may not have a significant federal tax liability, and;
  - b. Many single store owners and others who do have tax liability are subject to the Alternative Minimum Tax. Exempting the tax credit from the impact of the AMT will allow these small operators the ability to establish alternative fuel infrastructure.
4. The renewable alternative fuel income tax credit may only be used to offset costs associated with improvements necessary to store and dispense renewable alternative fuels as defined by the Secretary of the Dept. of Energy.
5. The tax credit would be subject to recapture rules for failure to use equipment for alternative fuels for at least 7 years.

WHY NOT A GRANT PROGRAM

Grant programs are onerous for the applicant (62% of convenience stores are owned by single-store operators), require significant federal grant management oversight, and often consume more than 18 months to promulgate rules and issue awards. Long term and on-going grant programs are also subject to annual appropriations which may be problematic.

Upon Legislative and Executive approval, a federal income tax credit can be initiated in a short period of time. Furthermore, all retailers are familiar with quarterly federal income tax reports which would be used to claim the credit. Financial support would be available in a timely manner, absent onerous and costly administrative expenses, and all expenditures would still be subject to IRS audit and oversight.

SUMMARY

Propel supports the extension and modification of the existing federal alternative fuel income tax credit:

- A tax credit program is much easier for the applicant to understand and process,
- requires less federal staff involvement, and is thus less costly for agency administration,
- provides funds in a rapid manner, and
- can be used to limit total outlays similar to grant programs.

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PETROLEUM MARKETERES ASSOCIATION OF AMERICA,  
Arlington, VA, April 7, 2011.

Hon. JEFF BINGAMAN,  
Chairman, Senate Energy and Natural Resources Committee, U.S. Senate, Washington, DC.

Hon. LISA MURKOWSKI,  
Ranking Member, Senate Energy Committee, U.S. Senate, Washington, DC.

Re: Letter before the Senate Energy and Natural Resources Committee Hearing Concerning the Department of Energy biofuel programs, biofuel infrastructure issues, and the "Biofuels Market Expansion Act of 2011"

DEAR CHAIRMAN BINGAMAN AND RANKING MEMBER MURKOWSKI: Many PMAA members will welcome the opportunity to sell greater ethanol blends, but concerns arise with the potential unintended consequences that create liability issues for retailers. PMAA supports expanded use of ethanol in our nation's fuel supply, however, until legal, regulatory, and financial concerns are addressed, greater ethanol usage will be minimal.

PMAA is a national trade association in the petroleum industry representing 8,000 independent petroleum marketing companies who own 60,000 retail fuel outlets such as gas stations, convenience stores and truck stops. Additionally, these companies supply motor fuels to 40,000 independently owned retail outlets and heating oil to seven million households and businesses. Of the 162,000 gasoline stations nationwide, nearly 97 percent are owned by small businesses. While they may sell a particular gasoline name brand, they are not owned by the major oil companies. Therefore, for a small business retailer to make the necessary upgrades to existing infrastructure to safely and legally sell greater ethanol blends, they must see an economic opportunity to market these new fuels.

Before I address the financial hurdles to accomplish USDA's goal to provide 10,000 blender pumps by 2022 and the "Biofuels Market Expansion Act of 2011" (S. 187), legal and regulatory uncertainties remain. Motorist misfueling is a great concern. Pay at the pump is very popular in the U.S. and a gas station or convenience store clerk is not in a position to stop a motorist from dispensing greater ethanol blends in an unapproved vehicle. Retailers need confidence that if the dispenser is labeled as specified by EPA, the retailer will not be held responsible for motorists' misfueling. Similarly, we need liability protection for retailers should mid-level ethanol blends damage a vehicle, so that the retailer will not be held responsible. For example, some experts believe greater ethanol blends could damage catalytic converters. The retailer must not be held responsible for repairs if he/she met every requirement specified by EPA. If EPA approves E15, they are in essence promising consumers that it will not damage their car. Retailers must not be held liable if it turns out that EPA was incorrect.

Another concern relates to underground storage infrastructure. We need EPA's Office of Underground Storage Tanks (OUST) to publish a list determining which storage tanks, piping, associated equipment, and dispensers are acceptable for greater ethanol blends. If a retailer does due diligence and confirms that his equipment meets EPA's standards, the retailer will then need protection from legal and insurance problems resulting from a leak caused by ethanol blends above ten percent. This topic relates to the Underwriters Laboratory (UL) certification requirement. Currently, very little existing infrastructure is UL certified for anything higher than 10 percent alcohol. If problems arise, we do not want fire officials citing retailers for not having UL certification. In the same sense, we do not want insurance companies using the UL certification requirement as a basis for denying a marketer's claim. Finally, it is unfortunate if the only way for a retailer to be absolutely certain that his liability is limited, is to replace all underground storage tanks, piping and dispensers—a very costly and unlikely scenario without significant tax and grant programs.

#### USDA BLENDER PUMP PROGRAM

Some PMAA member companies see the blender pump infrastructure proposal is a thinly veiled attempt at getting 100 percent of the cost of dispensers paid for, with little or no thought given to the underground issues. We are concerned that some retailers will sell E15 due to the price advantage compared to E10 while not confirming that the underground equipment is compatible with anything over E10. Additionally, there are concerns that retailers will install blender pumps in counting on marketer funded state tank funds to cover any releases. This would increase state tank funds for every marketer even for the ones that play by the rules in making sure that their underground equipment is compatible with E15.

#### EPA'S OFFICE OF UNDERGROUND STORAGE TANKS (OUST) E15 COMPATIBILITY GUIDANCE

Recently, EPA's Office of Underground Storage Tanks (OUST) released its Notice of Proposed Guidance (NPG) to interested parties that would clarify its compatibility requirement for UST systems storing E15. This is an interim guidance period which is subject to change when EPA determines what compatibility means in its Notice of Proposed Rulemaking likely to be issued this summer. Guidance is just a suggested road map that marketers and states could use to determine the compatibility of E15 with legacy equipment.

PMAA would like to see the EPA OUST develop a risk-based assessment tool for legacy UST equipment that could be used to determine system compatibility. Risk

assessments could be based on the age of equipment in the ground, the type of tank used in the system, such as single wall, double wall, fiberglass, lined, or steel tank, the type of piping, leak detection systems and release prevention equipment used in the system. Once a risk assessment judgment is made on the system, a compatibility determination can be made. A compatibility finding could also be conditioned on additional requirements that must be met before the system qualifies for E-15 service. A risk based system for determining compatibility would be cost effective and a reliable indicator of which systems is suitable for E-15 use. For example, if the federal government's blender pump grant program could also be directed at investments in electronic leak detection systems, this could help satisfy compatibility requirements even if a retailer was uncertain whether piping, glues, adhesives was fully compatible with a higher ethanol blend. The electronic leak detection would notify a retailer within a matter of minutes if there was a leak and the retailer could then take the proper steps to clean up the leak. Electronic leak detection systems are very effective for quickly finding a leak underground and would be a cost effective way for retailers to determine compatibility with mid-level ethanol blends.

#### BIOFUELS INFRASTRUCTURE GRANTS/TAX CREDITS

Financially speaking, grant programs focused solely on dispensers is inadequate and can potentially be a public safety concern. Underground leaks from piping and tanks do occur and it is important that the proper precautions are taken to ensure that the tank and piping is compatible to handle E10 plus fuels and that the tank is thoroughly clean and water is not present in the tank. One underground storage leak can force a retailer out of business. A \$100,000 grant per site that is applicable to underground storage tanks, piping, submersible pumps, drop tubes, level sensors, and blender pumps may encourage retailers to make the necessary upgrades to market greater ethanol fuels in addition to tax credits. Additionally, marketers must be reimbursed within 30 to 60 days.

Additionally, the current alternative fuel tax credit must be increased to a minimum of \$250,000 for a potential 50 percent credit worth \$125,000 per site. The credit must be eligible to be carried back at least 2 years and forward 20 years and must be applicable to blender pumps and all associated underground infrastructure. The credit must also be eligible for 100 percent of the cost of a complete blender pump. This may incentivize the station owner to make the necessary upgrades to market greater ethanol blends. Additionally, if USDA/DOE wants to entice a retailer to replace perfectly serviceable infrastructure currently compatible with E10 (in many cases only one-third to one-half through the expected useful life), USDA and DOE will need to provide significant financial assistance.

PMAA looks forward to working with you as the federal government moves forward with its program to expand ethanol use. Again, PMAA would like to emphasize that it supports the expanded use of ethanol and is committed for a sustained and effective marketing plan to convince retailers that financial incentives are available to help them make the necessary upgrades to safely and legally sell greater ethanol blends.

Sincerely,

DAN GILLIGAN.